1995

A numerical model of the global carbon cycle to predict atmospheric carbon dioxide concentrations

Alexis Demitrios Kambis
College of William and Mary - Virginia Institute of Marine Science

A NUMERICAL MODEL OF THE GLOBAL CARBON CYCLE TO PREDICT ATMOSPHERIC CO_2 CONCENTRATIONS

A Dissertation
Presented to
The Faculty of the Department of Physics
The College of William and Mary in Virginia

In Partial Fulfillment
Of the Requirements for the Degree of
Doctor of Philosophy

by
Alexis D. Kambis
1995

UMI Number: 9605789

UMI
300 North Zeeb Road
Ann Arbor, MI 48103

APPROVAL SHEET

This dissertation is submitted in partial fulfillment of

the requirements for the degree of

Doctor of Philosophy

Alexis Kambis

Approved, February 1995

7/28/95

Joel Levine

William Kossler

Marc Sher

Eugene Tracy

Gerald Johnson
Department of Geology

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ACKNOWLEDGEMENTS

The author wishes to express his appreciation to Dr. Joel S. Levine of NASA Langley Research Center in Hampton, Virginia, under whose guidance this work was completed. The author is also indebted to the Atmospheric Sciences Division of NASA Langley as well as Science Applications International Corporation (NASA contract number NAS1-19570) for providing office space, financial support, and computational resources in support of this investigation.

I also wish to thank my wife for her constant support and encouragement, and her mother for typing and proofreading the early drafts of this document.

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ABSTRACT

A numerical model of the global carbon cycle is presented which includes the effects of anthropogenic CO_2 emissions (CO_2 produced from fossil fuel combustion, biomass burning, and deforestation) on the global carbon cycle. The model is validated against measured atmospheric CO_2 concentrations. Future levels of atmospheric CO_2 are then predicted for the following scenarios: (1) Business as Usual (BaU) for the period 1990-2000; (2) Same as (1), but with no biomass burning; (3) Same as (1), but with no fossil fuel combnustion; (4) Same as (1), but with a doubled atmospheric CO_2 concentration and a 2 K warmer surface temperature associated with the doubled atmospheric CO_2 concentration.

The global model presented here consists of four different modules which are fully coupled with respect to CO_2. These modules represent carbon cycling by the terrestrial biosphere and the ocean, anthropogenic CO_2 emissions, and atmospheric transport of CO_2.

The prognostic variable of interest is the atmospheric CO_2 concentration field. The CO_2 concentration field depends on both the sources and sinks of CO_2 as well as the atmospheric circulation. In addition, the sources and sinks vary significantly as a function of both time and geographic location.

The model output agrees well with measured data at the equatorial and mid latitudes, but this agreement weakens at higher latitudes. This is due to the less adequate representation of the terrestrial ecosystem models at these latitudes. In the first scenario, the predicted concentration of atmospheric CO_2 is 362 parts per million by volume (ppmv) at the end of the 10 year model run. This establishes a baseline for the next three scenarios, which predict that biomass burning will contribute 3 ppmv of CO_2 to the atmosphere by the year 2000, while fossil fuel combustion will contribute 5 ppmv. The net effect of a 2 K average global warming was to increase the atmospheric CO_2 concentration by approximately 1 ppmv, due to enhanced respiration by the terrestrial biosphere.

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CHAPTER 1: Introduction

Recently the need to quantitatively assess the long term climatic implications of global biomass burning has been asserted (Houghton[1], Walker and Kasting[2]). Based on existing data, it has been predicted that biomass burning is responsible for 20%-40% of the total anthropogenic CO_2 emitted into the atmosphere (Levine[3]). Biomass burning is defined to include the following processes: burning associated with deforestation, burning of wood as a fuel, burning of grasslands and agricultural burning.

The model presented here consists of several previously existing sub-models, discussed below, which represent cycling of carbon by various chemical, physical and biological processes within the global carbon cycle. In constructing this model, preference was given to previously existing models that had been validated separately. This is especially important when the sub-model is highly parameterized, as in the case of individual ecosystem models. Here, the models were developed by experts in the particular ecosystem type, and have been tested against ground based measurements. The ocean circulation sub-model and ocean carbon sub-model have also been separately validated, and, like the ecosystem models, were adapted from the literature for integration into this model.

It is known that atmospheric CO_2 enhances the existing atmospheric greenhouse effect by trapping additional thermal radiation, thus increasing the surface temperature of the earth (Ramanathan[4]). The level of atmospheric CO_2 is regulated by the global carbon cycle (Bolin and Fung[5], Box[6]). The global carbon cycle consists of the network of sources and sinks of atmospheric CO_2 together with virtually every physical and biochemical process involving carbon on earth including global biomass burning. This burning releases large amounts of CO_2 into the atmosphere some of which is reclaimed (reincorporated) into the terrestrial biosphere (land plants) over the course of months to years. This reincorporation occurs during the period of regrowth following the annual burning of certain ecosystems, primarily grasslands. However, when an ecosystem, such as a tropical rainforest, is burned, it can no longer act as a sink for atmospheric CO_2, thus the CO_2 released is not reincorporated since the rainforest is not replaced. This affects the global carbon cycle in two ways: (1) the carbon stored in the forest structural material must now be redistributed within the reservoirs of global carbon cycle; and (2) an area once acting as a sink for atmospheric CO_2 no longer does so. Whether these disturbances will have prolonged effects upon the global carbon cycle is presently unknown.

When attempting to predict the future concentration of atmospheric CO_2, models of the global carbon cycle are developed. At the most basic level, the global carbon cycle model consists of a set of carbon reservoirs representing the atmosphere, the oceans, and the terrestrial biota, along with a specified set of carbon fluxes between these reservoirs (Fig. 1.1). In order to illustrate the large scale features of the global carbon cycle, a simple model was developed. Using such a basic model, numerical experiments were performed and analyzed. The results are presented in chapter 3, along with a more complete description of the basic model. A more elaborate model is then developed so that the complex processes within each of the reservoirs can then be represented more realistically (Fig. 1.2). The complete model ultimately seeks the solution to the continuity equation for carbon dioxide in the atmosphere:

$$\frac{\partial C\rho}{\partial t} = -\nabla \cdot \left(\vec{V} C\rho\right) + \Phi + T_v C\rho$$

Where C represents the CO_2 concentration in a particular grid cell, ρ is the density of air, $\vec{V}$ is the horizontal wind velocity, T_v is the horizontal transport due to wind, and Φ is the corresponding source or sink at the surface beneath the grid box. The model computational grid is 5 degrees by 5 degrees longitude by latitude and extends over the globe. The model itself is composed of individual sub-models for the atmosphere, ocean and biosphere, henceforth referred to as modules and data sets representing fossil fuel combustion, biomass burning and deforestation. The primary objective of each individual module is to compute Φ as a function of time, location, and local driving variables governing CO_2 exchange. Local driving variables include rainfall, incident solar radiation, temperature and windspeed. The secondary objective of the modules is to predict the response of the individual modules to increasing atmospheric CO_2.

ATMOSPHERIC CIRCULATION

In addition to serving as a sink to CO_2, the atmosphere couples the oceans, terrestrial biosphere, and anthropogenic CO_2 sources. An accurate model of atmospheric transport is necessary due to the short time scales involved in the ocean and global terrestrial carbon cycles relative to the atmospheric transport times. Specifically, the time required for atmospheric transport is greater than the time required for atmosphere-ocean or atmosphere-biosphere exchange. i.e. in a single model time step, the amount of carbon in an atmospheric grid box may be significantly altered by the sources and sinks for carbon at the surface of the earth more rapidly than the atmosphere can mix. These time scales are short due to the rapidity of CO_2 exchange between the atmosphere and a source or sink compared with the atmospheric transport time.

TERRESTRIAL BIOSPHERE

A set of eight existing ecosystem models together representing over 80% of the terrestrial biosphere have been taken from the literature (King and DeAngelis[7]). These models are integrated into a global terrestrial biosphere module with both spatial and seasonal variability. Spatial and seasonal variability are necessary in order to reproduce large scale features of the atmospheric CO_2 distribution as well as being critical to predict model feedback effects, such as the response of the individual ecosystems to increasing levels of atmospheric CO_2, changing rainfall distributions, and changing temperature distributions.

OCEAN CARBON CYCLE

An existing ocean circulation model (Bryan[8], Cox[9]) is used to predict transport of carbon compounds within the ocean. This model is used to both advect the compounds relevant to the ocean carbon cycle and to determine values of temperature and salinity which affect the carbon chemistry within the earth's oceans. It is necessary to represent the physical ocean circulation explicitly since the ocean biochemical processes controlling the cycling of carbon strongly depend upon factors such as equatorial circulation, upwelling of deep water, and downwelling of surface water.

FOSSIL FUEL COMBUSTION

The effects of fossil fuel combustion, i.e. the burning of coal, oil, and natural gas, are included in the model in the form of a global data set of CO_2 emissions. It has been determined that fossil fuel combustion is the primary source of anthropogenic CO_2 released into the atmosphere (Rotty and Marland[10], Perry[11]), thus future atmospheric CO_2 levels as well as the state of the global carbon cycle will depend strongly on future CO_2 emissions from the consumption of these fuels. In order to completely specify the inventory of CO_2 sources, scenarios for the use of fossil fuels must first be determined.

Given a specific scenario, a data set of global CO_2 emissions can be generated and used as model input.

GLOBAL BIOMASS BURNING

Finally, the effects of global biomass burning are addressed. Distribution and frequency of occurrence of biomass burning are given on the 5 degree x 5 degree global grid along with estimates of the CO_2 that is released during this burning for specific types in the form of a data set describing the type of ecosystem burned (grassland or forest), the months of peak burning, and the average CO_2 released per month during the burning season. A simple representation of the effects of deforestation associated with burning in the tropics is then incorporated into the model. An assessment can then be made of the impact of biomass burning and associated deforestation scenarios on the global carbon cycle and on atmospheric CO_2 distributions.

The nature of the influence of atmospheric CO_2 on global warming is discussed followed by a separate chapter describing each module and its contribution to he global carbon budget. The module couplings and full model validation are then discussed, followed by a discussion of limitations and processes not treated in the individual modules. Limitations in the full model are then discussed. Understanding these limitations is crucial to the interpretation of the model results. These limitations can also be viewed as possibilities for future improvements to the model. The performance of the model is assessed, and the outcomes of model scenarios are presented. It is now possible to evaluate future states of atmospheric CO_2 concentrations corresponding to future patterns of fossil fuel combustion and biomass burning. Finally, the results of the previous calculations are interpreted in light of the model limitations and realistic future scenarios of biomass burning and fossil fuel consumption.

Figure 1.1 Global Carbon Cycle

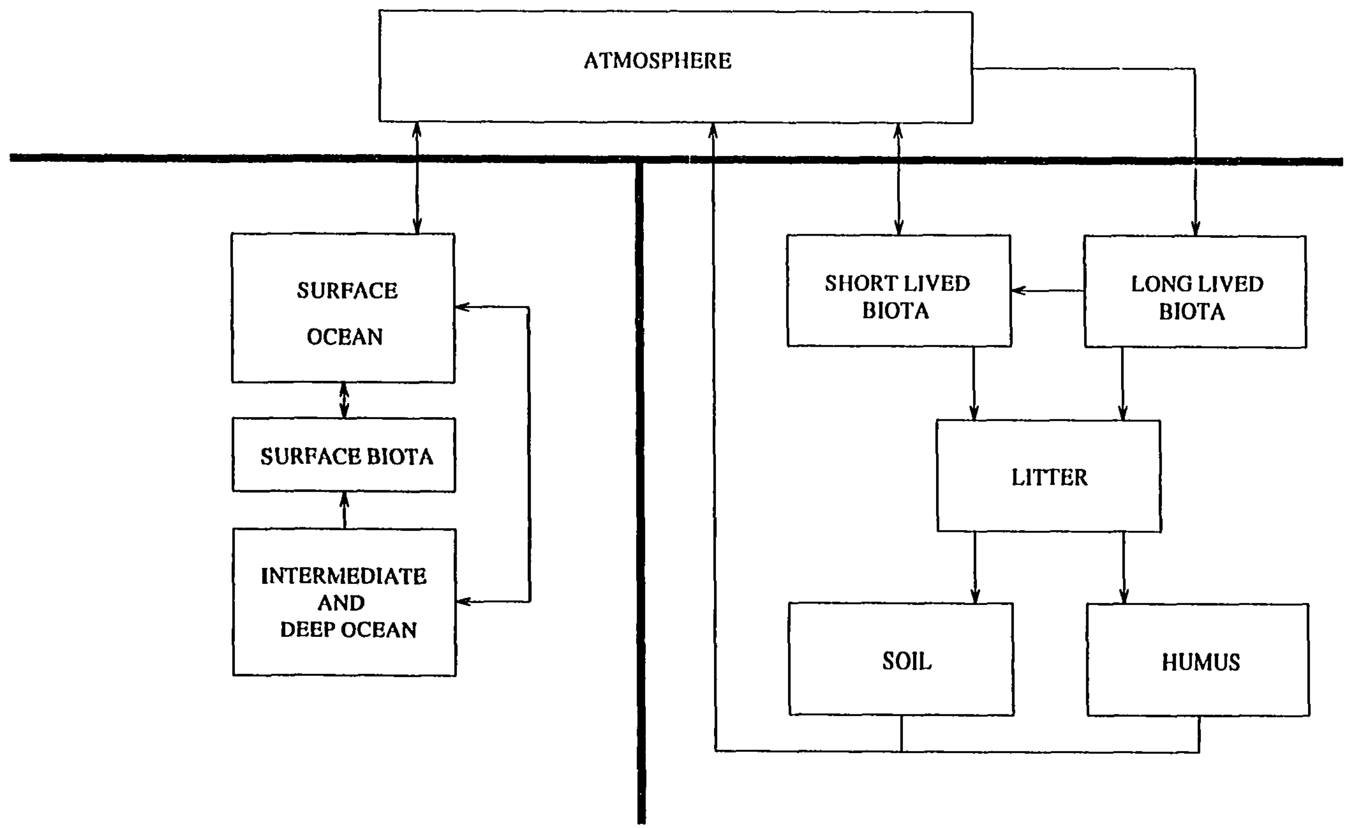
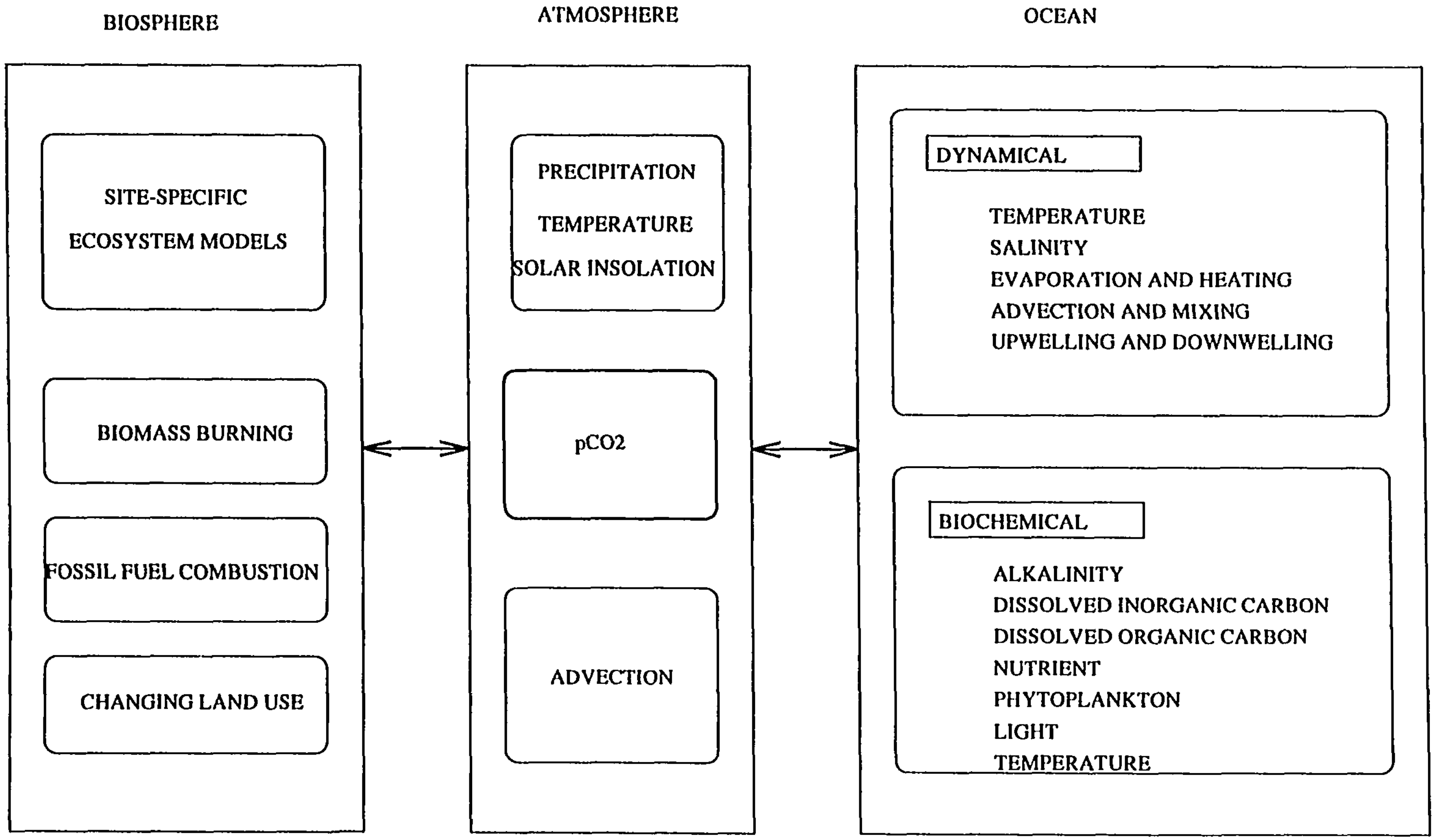


Figure 1.2 Present Model



CHAPTER 2: CO_2 and Global Warming

Since the primary motivation for the construction of most, if not all models of the global carbon cycle is the prediction of future levels of atmospheric CO_2, an introduction to how CO_2 in the atmosphere contributes to global warming is presented. Carbon dioxide in the atmosphere is of vital importance to the earths climate (Tirpak[12]). CO_2 gas is transparent to visible radiation, thus allowing solar radiation through the atmosphere to warm the earth. CO_2 is, however, opaque to infrared radiation, trapping the heat emitted from the earths surface. This property is shared by most diatomic and triatomic molecules in the atmosphere. Carbon dioxide, however, is unique in its ability to contribute to global warming. This thermal insulating property of the atmosphere raises the mean global temperature from approximately -18 degrees centigrade to 15 degrees centigrade. This process has become known as the natural greenhouse effect, and it is in this manner that increased concentrations of atmospheric CO_2 can have profound and long term effects on the earth's climate. The global warming due to CO_2 relative to other anthropogenic greenhouse gases is shown in Figure 2.1.

Prior to 1850, the concentration of atmospheric CO_2 is taken to be approximately 280 parts per million by volume (ppmv). The concentration in 1993 was 25% greater at 353 ppmv. The present concentration of CO_2 in the atmosphere is the highest recorded in the past 160,000 years, while the current rate of increase of atmospheric CO_2 is approximately 0.5% per year due to the anthropogenic emissions, which were estimated to be 5.7 + 0.5 Gt carbon per year (1 Gt=10^9 metric tons) in 1987 due to fossil fuel combustion alone, and between 0.6 Gt C and 2.5 Gt C due to deforestation for the same year (Bowden[13]) et al.).

Global warming of the magnitude predicted by current climate models has possibly disastrous implications. If the concentration of atmospheric CO_2 continues to increase at the present rate, the rate of mean global temperature increase will be at least 1 K y^{-1} (Levine[14]). The sea level rise associated with this warming is predicted to be one meter (Levine[14]; Levine[15]). This rise would threaten the homes of between thirty to forty million people (Houghton[1]). Any increase of the tropospheric temperature and decrease of stratospheric temperature would also alter global precipitation patterns (MacCracken and Luther[16]). The combined effect of global warming with altered precipitation patterns may at best change the distribution of ecosystems only slightly, as they adjust to the new local climates, and at worst occur too rapidly for certain ecosystems to adapt to the new local conditions.

Theoretical climate calculations indicate that a doubling of atmospheric CO_2 will lead to an increase of the average surface temperature of the earth by 1.5 to 4.5 K. These calculations also indicate that a 1-2 K warming at the mid latitudes could result in a heating of the polar regions several times greater (Hibler and Thorndike[17]). This is thought to be partly because of a feedback effect where initial warming melts ice, thus exposing underlying land. The land absorbs much more thermal radiation than does ice; therefore, polar warming is enhanced and the feedback process continues.

The natural greenhouse effect can be illustrated by considering the earth from a point in space outside the atmosphere. The two processes for heating the earth are the absorption of solar radiation and the emission of thermal radiation. In equilibrium, this can be written:

$$E_s = E_i \tag{1}$$

An expression for absorbed solar radiation can be written:

$$E_s = I(0)\,(1-\alpha)\,\pi {R_e}^2 \tag{2}$$

where $I(0)$ is the intensity of solar radiation at the top of the atmosphere, α is the albedo, or reflectivity of the earth's surface, and R_e is the radius of the earth.

Similarly, the earth's thermal emission can be written:

$$E_t = \sigma {T_e}^4 4\pi {R_e}^2 \tag{3}$$

In the above equation, σ is the Stefan-Boltzmann constant, and T_e is the earth's temperature.

Substituting (2) and (3) into (1) yields:

$$I\,(0)\,(1-\alpha)\,\pi {R_e}^2 = 4\sigma {T_e}^4 \pi {R_e}^2 \tag{4}$$

Or,

$${T_e}^4 = \frac{I\,(0)\,(1-\alpha)}{4\sigma} \tag{5}$$

Substituting the values $I(0) = 1360\ Wm^2$, $\alpha = 0.3$, and $\sigma = 5.67$ x 10-8 $Wm^{-2}K^{-4}$, a value of 254K is obtained for T_e. The measured value of T_e is 288K as a global annual average (Ramanathan and Cockley[18]). The reason that the earth's temperature is so much greater than the value calculated above is because much of the emitted thermal radiation is trapped by the atmosphere.

Reworking the previous analogy, this time with a single layer atmosphere (Fig. 2.2), (1) becomes:

$$\frac{1}{4} I\,(0)\,(1-\alpha) = \epsilon_a \sigma {T_s}^4 \tag{6}$$

$$2\epsilon_a \sigma {T_a}^4 = \epsilon_a \sigma {T_s}^4 \tag{7}$$

Solving eqn. 7 yields:

$${T_a}^4 = \frac{1}{2} {T_s}^4 \tag{8}$$

$$\sigma {T_s}^4 = \frac{\frac{1}{4} I\,(0)\,(1-\alpha)}{1-\frac{1}{2}\epsilon_a} \tag{9}$$

$${T_s}^4 = \frac{{T_e}^4}{1-\frac{1}{2}\epsilon_a} \tag{10}$$

$${T_a}^4 = \frac{{T_e}^4}{2-\epsilon_a} \tag{11}$$

Solving the above equations gives a surface temperature of 288K and an atmospheric temperature of 244K. The earth's surface temperature depends upon the atmospheric temperature in the following way:

$$\frac{d\left(T_s\right)}{T_s} = \frac{1}{4}\frac{\frac{1}{2}\sigma {T_s}^4 d\left(\epsilon_a\right)}{\left(1-\frac{1}{2}\epsilon_a\right)\sigma {T_s}^4} \tag{12}$$

The primary anthropogenic atmospheric gas responsible for determining the atmospheric emissivity is carbon dioxide. Doubling the atmospheric concentration of CO_2 results in an increase of the downward flux of thermal radiation by approximately 4 Wm^{-2}. Assuming that no feedback mechanisms are in effect (this will be discussed below), and setting the absorbed solar radiation to 240 Wm^{-2} and T_s to 288K, the change in the earth's surface temperature represented by $d(T_s)$ is calculated to be 1.2K. One feedback mechanism associated with atmospheric warming is an increase in atmospheric water vapor concentration (IPCC[19]). Because of its opacity to thermal radiation, water vapor is the most efficient greenhouse gas. However, since there is an abundance of water vapor in the atmosphere, as well as liquid water at the earth's surface, the concentration of atmospheric water vapor cannot be controlled directly. The concentration of water vapor in an atmospheric region is specified by the Clausius-Claperyon equation:

$$\epsilon_s\left(T\right) = \epsilon_s T\left(0\right) exp\left(\frac{\frac{L_v}{R_w}}{\frac{1}{T_0}-\frac{1}{T}}\right) \tag{13}$$

In the above equation, $\epsilon_s(T)$ is the saturation vapor pressure at a temperature T, $\epsilon_s(T_0)$ is the saturation vapor pressure at a reference temperature T_0, L_v is the latent heat of vaporization for water, and R_w is the gas constant for water.

According to eqn. 13, if the average temperature of a grid box increases, the saturation vapor pressure of that box, given by $\epsilon_s(T)$, will also increase. If the assumption that the ratio $\frac{\epsilon}{\epsilon_s(T)}$ remains approximately constant over a large area, then the amount of water in the grid box, ϵ, must also increase.

The validity of the above assumption rests upon there being a large amount of water available at the earth's surface. This being so, the main physical process controlling the saturation vapor pressure is the rate of evaporation. This rate is proportional to $\frac{\epsilon}{\epsilon_s(T)}$.

The principle of water vapor feedback is contained in the following argument: If the temperature within a grid box increases, $\epsilon_s(T)$ increases. If water evaporates so as to maintain a constant ratio $\frac{\epsilon}{\epsilon_s(T)}$, ϵ will increase. Since water vapor is a greenhouse gas, the temperature of the grid box will increase further giving a new positive feedback. The reason that this feedback does not continue without bound is that the ratio $\frac{\epsilon}{\epsilon_s(T)}$ is only approximately constant.

Including the water vapor feedback effect, and for a doubling of atmospheric CO_2, the following results are obtained: (1) For a warming of 1.2K due to CO_2 alone, the additional water vapor increase causes a factor of four increase in the radiative forcing as shown below. (2) Since the forcing is proportional to the surface temperature, this implies a four-fold increase in temperature as well. This simplistic analysis gives results that are within the range of the most detailed atmospheric general circulation model (GCM) analyses available (Sundquist[20]).

Figure 2.1 Global Warming Potentials

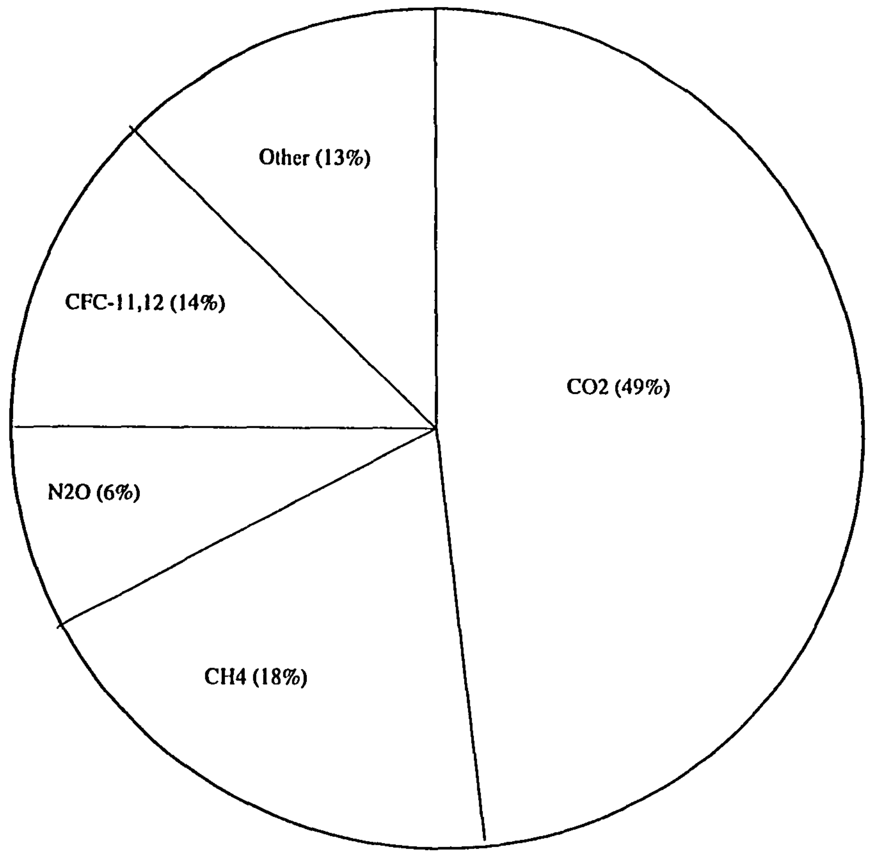
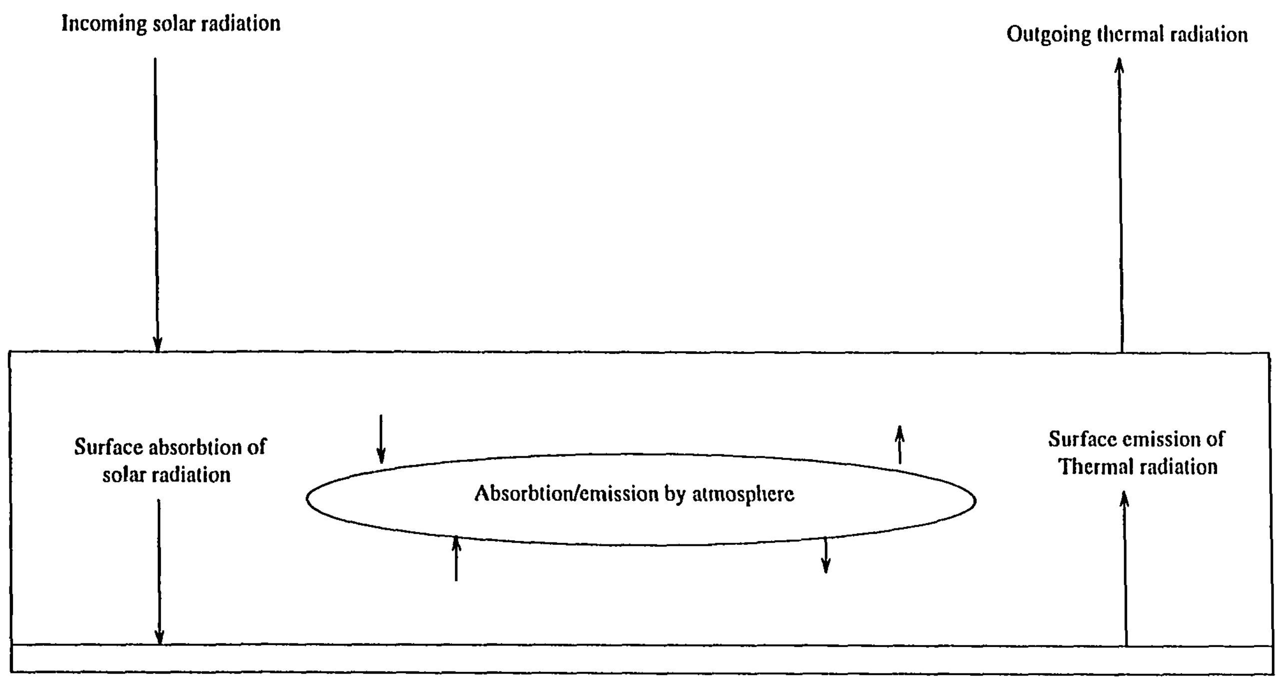


Figure 2.2 Single Layer Atmosphere



CHAPTER 3: A Simple Model of the Global Carbon Cycle

In order to capture the large scale features of the global carbon cycle and to take a first step towards understanding the complete model, a simplified model of the carbon cycle is presented. This simple model consists of sources and sinks that respond to the increased atmospheric CO_2 resulting from anthropogenic emissions by either sequestering or releasing carbon. The conceptual representation of this model is shown in figure 3.1. A discussion of the features of the global carbon cycle included in the simple model are as follows:

Approximately one half of the CO_2 emitted into the atmosphere by anthropogenic sources remains there (Sundquist[20]; Brewer[21]; Quay[22] et al.). The remainder is taken up by sinks. The known sinks for atmospheric CO_2 include uptake and incorporation into the terrestrial biosphere via photosynthetic activity, incorporation into the ocean via dissolution and subsequent introduction into the ocean carbon cycle, and incorporation into phytoplankton via photosynthetic activity in the surface ocean. CO_2 is chemically inert in the atmosphere; therefore, there are no known atmospheric removal mechanisms for CO_2. The net flux of CO_2 into the ocean is between 60 and 90 Gt C y^{-1}, neglecting anthropogenic sources of CO_2 (Phillips[23]). Fossil fuel combustion, biomass burning, and changing land use create a mean imbalance of 5 to 10 ppmv of CO_2 in the atmosphere, resulting in the addition of approximately

2.5 Gt y^{-1} of carbon to the ocean (Pearman[24]). The time required for the atmosphere to adjust, or come into equilibrium, due to alteration in either the CO_2 sources or sinks is on the order of fifty to two hundred years. This time constant is governed mainly by the rate of exchange of ocean surface water with the deep ocean water and, to a lesser extent, the atmosphere-ocean exchange (Phillips[23]). Therefore, CO_2 emitted into the atmosphere today could have climatic impacts ranging into the next two centuries.

The addition of CO_2 to the atmosphere has potential effects upon the very sinks that are responsible for removing CO_2. For example, the addition of CO_2 to the atmosphere is thought to induce a fertilization effect on the terrestrial biosphere (Bacastow[25] et al.). This CO_2 fertilization effect causes plants to incorporate the added atmospheric CO_2 into plant structural material. Although the carbon is released back into the atmosphere through respiration and decomposition, the net effect is to enhance the ability of the terrestrial biosphere to sequester atmospheric CO_2. The CO_2 fertilization effect is discussed in greater detail in chapter 5.

The ocean also responds to increased concentrations of CO_2. Various regions of the surface ocean are currently becoming saturated with respect to CO_2. This implies that regions which may have acted as sinks in the past may become sources of CO_2 (Volk and Liu[26]). There is also the possibility of effects of climatic change on the global carbon cycle. The warming of the atmosphere discussed in Chapter 2 could lead to changes in the temperature, wind fields, and precipitation patterns (Dixon[27]). These are precisely the variable that drive ocean circulation and the solubility of CO_2 in the ocean (Takahashi[28]; Rosati and Miyakoda[29]), and also, to a great extent, the distribution and functionality of ecosystems (King and DeAngelis[7]).

Thus, while a more realistic dynamical model is indicated, the broad scale features of the global carbon cycle can be understood through a simple representation in which the modules representing the atmosphere, ocean, and terrestrial biota have been replaced by sets of reservoirs representing carbon storage within that particular system. The atmosphere is represented as a single box, and the variable of interest is the CO_2 concentration as a function of time. The ocean is represented with two compartments, one for shallow water in direct contact with the atmosphere and the other for deep water which does not come into contact with the atmosphere but does absorb carbon from the shallow water above it. Minor modifications to this box-model have been investigated, such as representing the oceans with many vertical boxes, allowing different geographical regions to be represented by a number of boxes, and allowing the boxes representing deep waters to directly contact the atmosphere to represent upwelling and downwelling (Moore[30]; Laut and Gundermann[31]; Volk and Liu[26]), (Fig. 3.2). The terrestrial biosphere is represented by four compartments which represent short-term carbon storage such as leaves, long-term carbon storage such as branches and other structural material, litter such as decomposing leaves and branches, and soil. The flow of carbon is represented by first order diffusion equations. The equations are solved simultaneously, and the solutions are presented in figures 3.3 through 3.5 corresponding to the following scenarios: (1) Fossil fuel burning: The atmospheric CO_2 concentration is doubled, and the model is integrated forward in time for a period of 100 years. The concentration of carbon in the various reservoirs is plotted as a function of time. (2) Biomass burning: In a radical scenario, 40% of the short-lived biota plus 10% of the long lived biota are converted to CO_2 and added to the atmosphere. The model integration and solution plots are as in scenario 1. (3) Deforestation: In a scenario similar to that addressed in (1), 25% of the short-lived biota plus 25% of the long-lived biota are removed from the carbon cycle. The model integration and solution plots are as in scenario 1. A complete description of the model follows. The carbon fluxes, Fij, are specified as first order exchange processes with the exception of F_{01},F_{10}, F_{03}, F_{30}, and F_{30}. These exceptions represent carbon flows between the atmosphere and surface ocean, and the atmosphere and terrestrial biosphere respectively, and are discussed below. The amount of carbon in the i^{th} reservoir is represented by Ci(t), and the amount present at time t=0 is Ci(0). The values for Ci(0) are taken from (Bolin and Fung[5]). The flux in steady state is represented by Fij(0). The Fij(0) are also taken from (Bolin and Fung[5]). Knowing the fluxes and amount of carbon in each of the reservoirs, a first-order exchange coefficient, K_{ij}, can be defined:

$$K_{ij} = \frac{F_{ij}}{C_i(0)}$$

The atmosphere-ocean flux must represent the buffering capacity of sea water which controls the CO_2 partial pressure and thus determines the gas exchange rate (Quay[22]; Phillips[23]). The buffering of sea water is controlled by the availability of dissolved inorganic carbon. Dissolved inorganic carbon is comprised of carbonate ions, bicarbonate ions, and dissolved carbon dioxide which take part in the reversible reaction:

$$(CO_2)_{atm} <-> (CO_2)_{ocn} <-> H_2CO_3 <-> HCO_3{}^{-} <-> CO_3{}^{-2}$$

Where the subscripts atm and ocn represent CO_2 in the atmosphere and ocean, respectively. Most of the dissolved inorganic carbon is bicarbonate ion (90%), while 9% is carbonate ion with the remaining 1% being actually dissolved CO_2 (Brewer[21]). At constant temperature and alkalinity, the partial pressure of CO_2 in sea water, PwCO_2 is given by:

$$\frac{10P(0)}{C_{id}(0)} C_{id}(t) - 9P(0) = P$$

P(0) is the preindustrial CO_2 partial pressure in the surface ocean, and Cid(0) is the corresponding preindustrial concentration of dissolved inorganic carbon. Rewriting the above relation and solving for the quantity

$$\xi = \frac{\frac{P(t)-P(0)}{P(0)}}{\frac{C_{id}(t)}{C_{id}(0)}}$$

gives

$$\xi = 10$$

where ξ is the Revelle factor.

This leads to the following expressions for atmosphere-ocean exchange of CO_2:

$$F_{0,3} = k_{0,3} C_0 (t)$$

$$F_{0,3} = k_{0,3} (C_0 (0)) + \xi \left(\frac{C_0 (0)}{C_3 (0)} \right) \Delta C_3 (0)$$

Respiration and photosynthesis can be expressed by:

$$P = F_{0,1} \left(\frac{C_1 (t)}{C_1 (0)} \right)^{\beta_a} \left(\frac{C_0 (t)}{C_0 (0)} \right)^{\beta_b}$$

$$R = F_{0,1} \left(1 + \frac{C_0 (t)}{C_0 (0)} \right)$$

The expression for photosynthesis comes from the observation that the uptake of CO_2 from the atmosphere by the terrestrial biota is proportional to both the amount of photosynthetically active material present, N3, and the atmospheric concentration of CO_2, N_0 (Acock and Allen[32]). The steady state amount of carbon in the reservoirs, N_i, and the steady state fluxes, F_{ij}, are given in Table 3.1.

Important to note is the sensitivity of atmospheric CO_2 to the ocean-atmosphere transfer rate, as well as the shallow ocean to deep ocean transfer. Also important is the sensitivity of atmospheric CO_2 to the particular parameterization of photosynthesis, Specifically, the CO_2 fertilization effect,here represented by the model constant β_b, causes the atmospheric CO_2 concentration to eventually fall below the initial steady state value, presumably since there has been enough new growth due to initially enhanced atmospheric CO_2 to substantially deplete the atmospheric CO_2 reservoir.

Figure 3.1 Simple Box Model

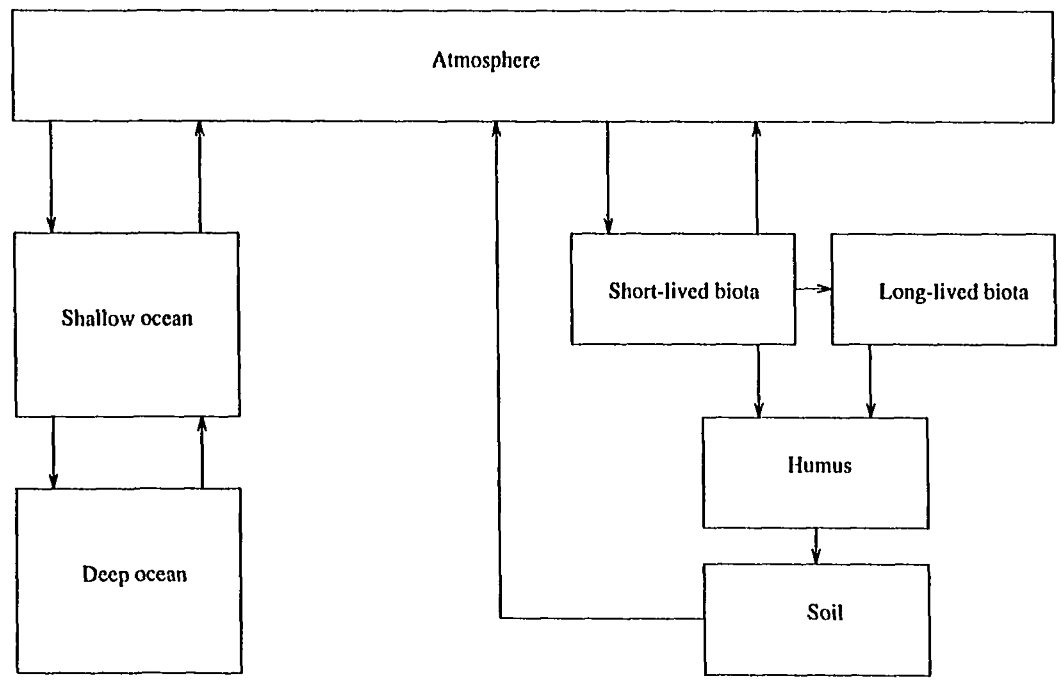


Figure 3.2 Upwelling Ocean Model

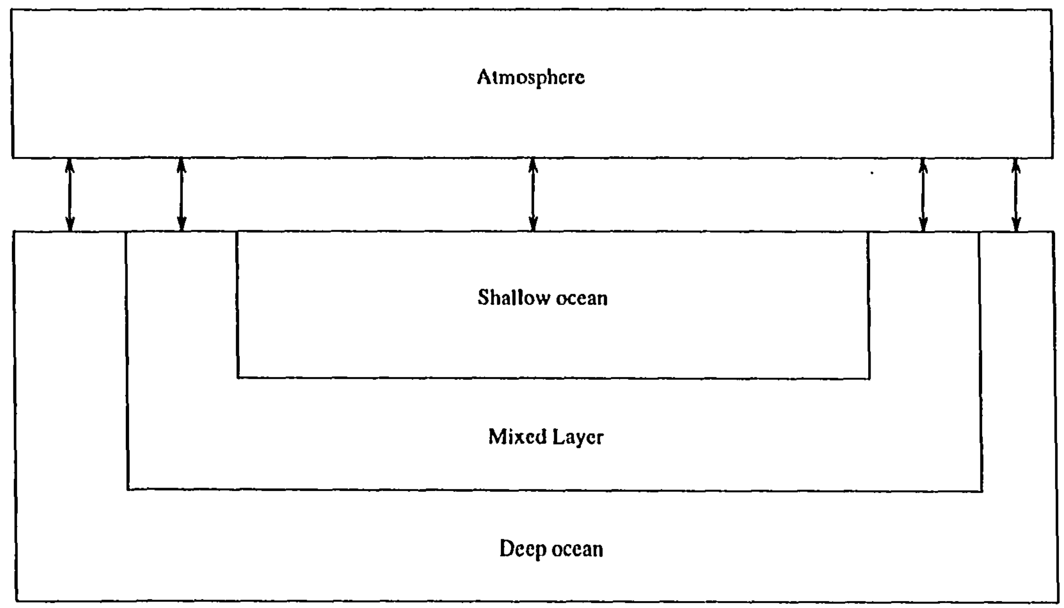


Figure 3.3 Fossil Fuel Combustion Scenario

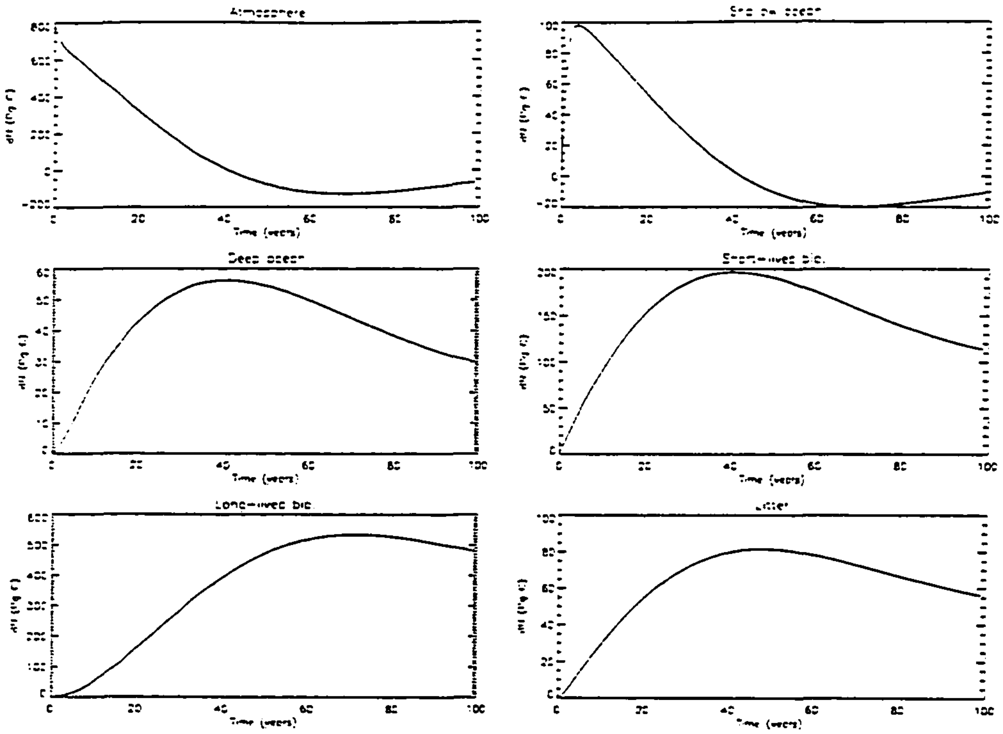


Figure 3.4 Biomass Burning Scenario

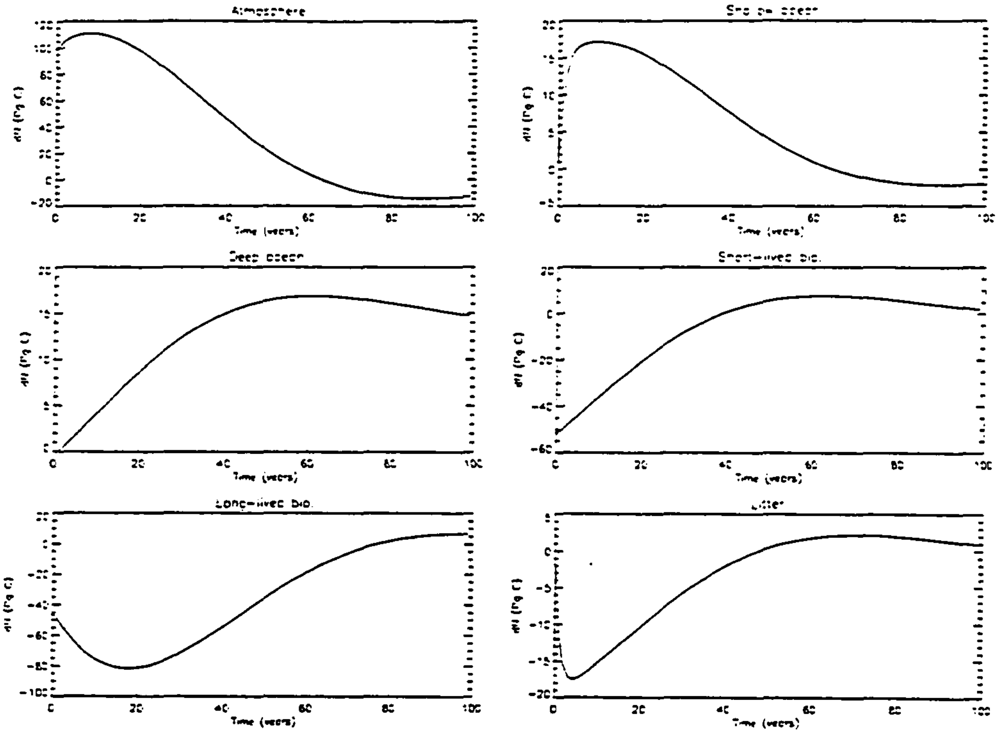


Figure 3.5 Deforestation Scenario

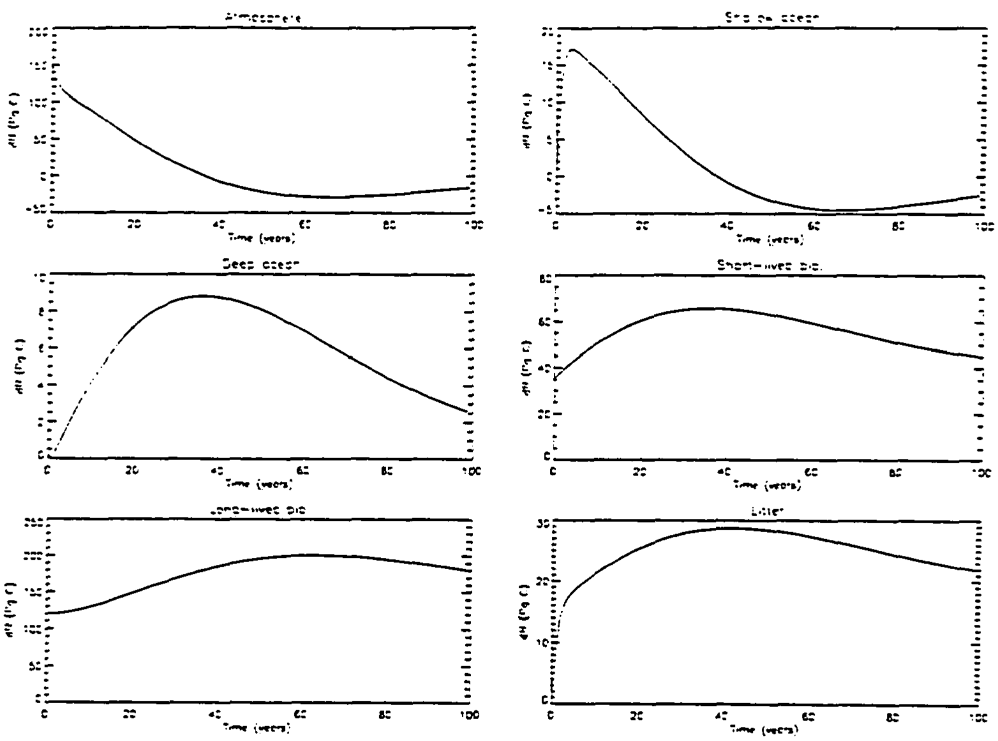


Table 3.1 Reservoir Model Fluxes

Gt C / yr	Atmosphere	Shallow	Deep	Branches	Structural	Humus	Soil
Atmosphere		100	0	110	0	0	0
Shallow	100		33	0	0	0	0
Deep	0	33		0	0	0	0
Banches	55	0	0		15	40	0
Structural	0	0	0	0		15	0
Humus	53	0	0	0	0		2
Soil	2	0	0	0	0	0	

CHAPTER 4: The Atmospheric Circulation Module

The atmospheric circulation module consists of a set of prescribed wind fields and a numerical advection algorithm. Its purpose is to predict the global concentration field of CO_2, both as an output variable of the complete model and as an input variable for the ocean and biosphere modules. The atmospheric circulation module begins with an initial distribution of atmospheric CO_2 specified on a global grid at time t_i, and returns a final distribution at a later time, t_f. Then, the net CO_2 released (absorbed) is added (subtracted) from the appropriate grid location. Due to the sensitivity of the ocean and biosphere to atmospheric CO_2 concentration and to the variability of tropospheric transport time scales, it is desirable to reproduce the atmospheric CO_2 distribution as accurately as possible. In addition to satisfying the above model requirements, an accurate transport scheme is of fundamental importance when attempting to reproduce observed values of atmospheric CO_2. In the present module, a set of wind field data obtained from the European Center for Medium-Range Weather Forecasting (ECMWF) was used to drive the atmospheric advection scheme. The data were in the form of 0 hour and 12 hour observational analysis fields of horizontal winds. The atmospheric advection algorithm calculates the distribution of CO_2 on a computational grid (Fig. 4.1) in the bottom most atmospheric layer defined in the data set. The horizontal grid resolution is

5 degrees by 5 degrees latitude by longitude, and the grid box height, measured in pressure coordinates, is from 1000 mb to 850 mb(0 - 1.5km height), corresponding with the previously mentioned wind field data set. The advection algorithm solves the finite-difference form of the tracer transport equation which can be arrived at as follows: First, the continuous form of the tracer transport equation is developed assuming that no sources or sinks of CO_2 exist. Then, the finite difference equations are developed, and the above assumption is relaxed. In the absence of sources and sinks, the rate of change of CO_2 in a fixed volume is equal to the amount of CO_2 advected in or out of the volume. This is represented by equation 4.1:

$$\frac{\partial C}{\partial t} + \nabla \cdot \vec{V} C = 0 \tag{1}$$

where C is the concentration of CO_2, $\vec{V}$ is the wind velocity, ∇ is the spatial gradient operator, and t is time. Equation 4.1 can be rewritten in terms of the material derivative:

$$\frac{\partial C}{\partial t} + \vec{V} \cdot \nabla C + C \nabla \cdot \vec{V} \tag{2}$$

or

$$\frac{dC}{dt} = -C \nabla \cdot \vec{V} \tag{3}$$

This has a distinct advantage when modeling atmospheric transport, namely that the following relation holds for divergence-free velocity fields:

$$\frac{\partial \rho}{\partial t} + \nabla \cdot \rho \vec{V} = 0 \tag{4}$$

Since the atmospheric wind fields are given in pressure coordinates, the mass of air within a specified volume remains constant. Hence, the velocity field is nondivergent. The concentration of CO_2 in the atmosphere is defined in terms of its mixing ratio, i.e. the concentration of CO_2 with respect to air in a specified volume. Rewriting equation 4.2 in terms of the CO_2 mixing ratio, and recalling equation 4.3, the conservative form of the tracer transport equation is found:

$$\mu = c\rho^{-1}$$

$$\frac{\partial \mu}{\partial t} + \vec{V} \cdot \nabla \mu = -\frac{\mu}{\rho}\left(\frac{\partial \rho}{\partial t} + \nabla \cdot \rho \vec{V}\right) \qquad (5)$$

Rewriting equation 4.4 to include sources and sinks gives:

$$\frac{\partial \mu}{\partial t} + \vec{V} \cdot \nabla \mu = \Phi_{ocn} + \Phi_{bio} + \Phi_{ffc} + \Phi_{bmb} + \Phi_{def} \qquad (6)$$

where the $\Phi's$ represent sources or sinks corresponding to the ocean, terrestrial biosphere, fossil fuel combustion, biomass burning, and deforestation respectively. Since the solution method for the advection equation in no way depends on the source and sink terms, its homogeneous counterpart (equation 4.4) will be used to illustrate the numerical advection algorithm. The full solution will be shown following the discussion of the numerical algorithm.

The concentration of CO_2 in a grid box centered on point (i,j) is represented by C_{ij} , while the wind field values are specified at the sides of the box. Other variables specified by the model are the first moments in the X and Y directions of the CO_2 distribution function within the box. These are defined at the center of the box along with the concentration. The finite-differencing scheme used to solve the tracer transport equation is known to be stable and virtually free from numerical diffusion (Russell and Lerner[33]).

In order to implement this scheme, the global model domain must be represented in a rectangular coordinate system. The dimensions of a grid box centered at latitude θ, with north-south and east-west extent $\Delta\theta$ and $\Delta\lambda$ respectively, are given by:

$$\Delta\lambda = \frac{\pi a}{N_\lambda}\left[cos\left(\theta + \frac{\Delta\theta}{2}\right) + cos\left(\theta - \frac{\Delta\theta}{2}\right)\right] \quad (7)$$

$$\frac{\Delta\phi = \pi a}{N_\phi} \quad (8)$$

and for the polar caps, defined to be $\theta > 87.5$ degrees by:

$$\Delta\lambda \; \frac{\pi a}{N_\lambda} cos\left(\theta_{max}\right) \quad (9)$$

$$\Delta\phi = \frac{\pi a}{N_\phi} \quad (10)$$

The tracer transport equation also requires that the mass of air in each grid cell, M_{ij}, be known. Using the above approximations for north-south and east-west extent, and the fact that the layer thickness is defined in pressure coordinates, the mass can be written:

$$\mu = \frac{\Delta p}{g}\Delta X \Delta Y \quad (11)$$

where Δp is the difference in pressure between the top and bottom of the layer, and g is the acceleration due to gravity. CO_2 is advected as a component of mass fluxes, i.e. mass per unit time transported out of a grid cell. These mass fluxes are computed from the prescribed wind field, and the mass of air contained within the grid box. Advection of CO_2 is defined to be along the flow of air, or upstream. During a time step dt, a portion of box j is advected into box j+1. The relevant quantities are defined as: M_k = mass of air in box k, S_x = first moment of tracer distribution in east-West direction, S_y = first moment of tracer distribution in north-south direction.

Advection is controlled by the mass flux, defined as the product of the wind velocity at the interface of two boxes, the interfacial area, and the density of the fluid in the upstream box. The mass of the portion of air that is advected upstream is given by:

$$\Delta M = U dt \tag{12}$$

These quantities are added to the respective quantities in the j^{th} grid box. The first moments of the tracer distribution function describe the ration of CO_2 to air mass, and advection is treated as a translation of coordinates in order to preserve the tracer distribution function as much as possible during advection. This minimizes the amount of computational error introduced during advection time steps. The tracer distribution within each grid box is continuous; however, there is a discontinuity in the first derivative of tracer distribution between grid boxes.

For a given grid box, k, the tracer distribution can be written:

$$C_{i-1} + \left(x + \frac{1}{2}[X_{i-1} + X_i]\right); -X_i < x < -\frac{1}{2}X_i$$

$$C_i + \frac{S_i}{X_i}x; -\frac{1}{2}X_i < x < \frac{1}{2}X_i$$

$$C_{i+1} + \left(x - \frac{1}{2}\left[X_i + X_{i+1}\right]\right); \frac{1}{2}X_i < x < \frac{1}{2}X_i + X_{i+1}$$

where $V = XxYxZ$.

The total amount of fluid (air + CO_2) is given by:

$$M_{ij} = \left(\frac{100}{g}\right) dp\Delta X\Delta Y \tag{13}$$

and the total amount of CO_2 is:

$$M_{ij} * C_{ij} \tag{14}$$

To calculate advective transport for a grid box, k, the box is first divided into two sub-boxes such that the mass of the right sub-box is the amount of fluid that would be advection out of the kth box in a time step *dt*. Each sub-box retains its original concentration, C(x), but now has new local moments defined with respect to its center of mass. After this has been done for every grid box in the model domain, all of the advected sub-boxes are summed in their respective destination boxes, and a new tracer distribution at time $t = dt$ is formed from the old moments. The distribution function for CO_2 is therefore reinitialized between each time step.

In practice, the two dimensional advection works in exactly the same manner. The advection is decomposed into north-south and east-west components, and the advection scheme is alternately applied to each component. This method of numerically solving the advection problem, however, introduces some error. The error arises from the de-coupling of north-south and east-west wind components. In other words, advection across a diagonal trajectory is ignored. This introduces a small error term.

Since the error introduced in on the order $(dt)^2$, one method of reducing the error would be to simply take smaller time steps. However, this becomes computationally expensive since the smallest allowable time step is dictated by the largest wind velocity in the entire computational domain. A spatial leapfrog method has been successfully applied to this advection algorithm (Prather[34]) and is likewise adopted for this study. The spatial leapfrog technique alternates integrations in the north-south and east-west directions in the following manner:

$$U^{t=t_{n+1/2}odd} = 0$$

$$V^{t=t_{n+1/2}even} = 0$$

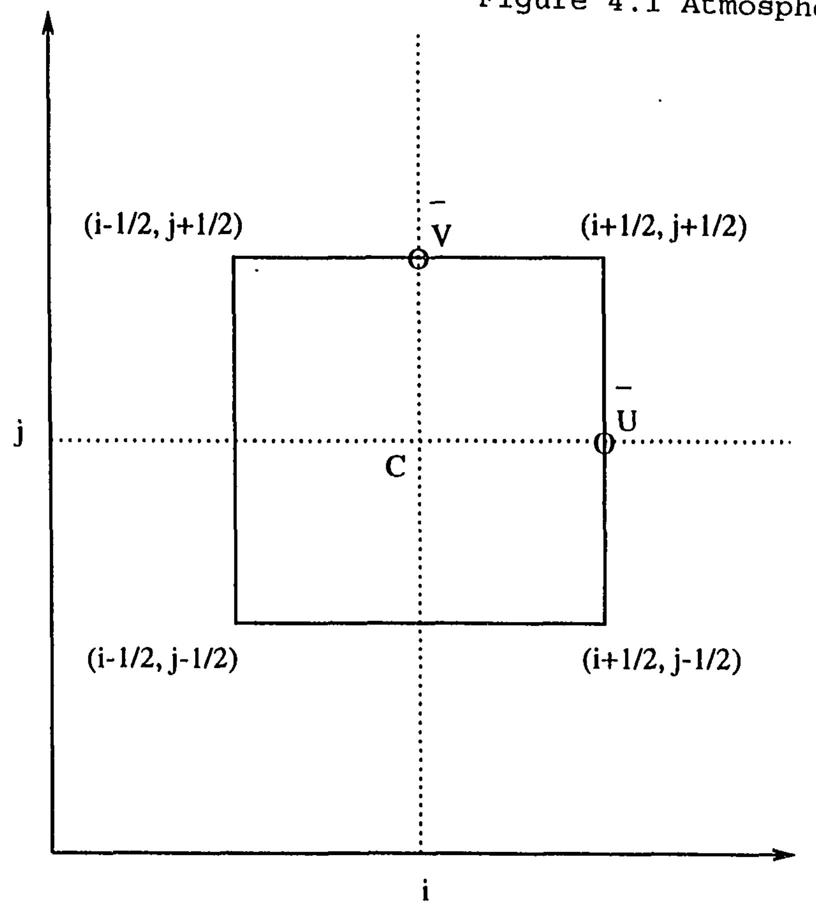
Vertical advection is defined to be the difference between the air masses advected through the horizontal faces of the grid box:

$$-W_{ij} = U_{ij} + V_{ij}$$

The vertically-advected tracer for each horizontal grid box goes into a single box that is defined in pressure coordinates to be $0 < p < 850mb$. The total mass is conserved, and the upper atmosphere acts as a single reservoir for CO_2.

The atmospheric advection module has been verified for both conservation of total tracer and preservation of initial tracer distribution with a uniform wind field over the globe.

Figure 4.1 Atmospheric Computational Grid



CHAPTER 5: The Terrestrial Biosphere Module

The cycling of carbon by the terrestrial biosphere is controlled by the processes of photosynthesis, respiration, and decomposition. These processes are different for each ecosystem, and the factors that affect them, namely temperature, rainfall, solar radiation, and wind speed vary as functions of both time and geographic location. The functional dependence of the processes on the factors, however, is assumed to be independent of geographic location. The seasonal variations of the biosphere have been inferred from data taken at various CO_2 monitoring stations mentioned in chapter 4.

A common feature of the seasonal distribution of atmospheric CO_2 is a high frequency oscillation superimposed on steady exponential growth (Fig. 5.1). The high frequency oscillation is due to seasonal photosynthesis/respiration processes of the terrestrial biosphere, while the nearly monotonically increasing component is correlated with the release of CO_2 into the atmosphere from fossil fuel combustion until about 1987. After 1987, fossil fuel consumption rises less dramatically, however the atmospheric concentration of CO_2 continues to increase exponentially (Rotty and Marland[12]).

The model terrestrial biosphere consists of a global ecosystem data base (Fig. 5.2) and eight site-specific ecosystem models which, taken together, represent over 80% of the net atmospheric CO_2 exchange due to the world's ecosystems (Table 5.1). The ecosystem data base specifies each ecosystem over a 1o x 1o global grid. The thirty-two different ecosystem classifications in this scheme are listed in table 5.2. The site-specific models are listed in table 5.3. The criteria for ecosystem module selection was sufficiently stringent that only eight different models were chosen from the literature. The two major criteria were (1) the models must have been verified, and (2) the models' output must depend on regional driving variables in such a way as to make extrapolation from site-specific CO_2 fluxes to regional CO_2 fluxes feasible. Other criteria, such as computational economy were considered as well.

The terrestrial biosphere is not static. It has been observed to change in response to increased atmospheric CO_2 concentration (Acock and Allen[32]). The response to increased CO_2 is known as the CO_2 fertilization effect. The biosphere will also respond to changes in climatic driving variables such as temperature and rainfall. Changes in variables such as these are expected to accompany increased atmospheric CO_2 (Houghton[35]; Hansen[15] et al). The response of the model biosphere must also depend strongly on changes in external forcings such as temperature and rainfall.

Plants require water, nutrients, photosynthetically active radiation (PAR), and CO_2 to take part in photosynthesis and respiration. Photosynthesis rates are typically proportional to available plant biomass, ambient CO_2 concentration, temperature, and sunlight (King[36] et al.). For example, in the temperate deciduous forest ecosystem model, photosynthesis in leaves, P_{tdf}, is modeled by:

$$P_{tdf} = P_{tdf}^{max} X_1 \lambda_1 ln \left(\frac{1 + \lambda\epsilon_1}{1 + \lambda\epsilon_0} \right)$$

where the variables are defined as follows:

P_{tdf}^{max} = maximum photosynthesis rate

X_1 = carbon stored in leaves

λ = light saturation coefficient

ϵ_0 = light intensity

ϵ_1 = $\epsilon_0 e^{-KX_1}$

For certain geographic locations and different ecosystems, however, the relationship is not as straightforward, and photosynthesis is sensitive to other variables as well. In high northern and southern latitudes, driving variables for photosynthesis such as water and PAR are limited. This in turn limits the amount of carbon that can be sequestered by these ecosystems (Townsend[37] et al.). For example, in the northern coniferous forest model, the driving variables consist of: total precipitation, average photosynthetically active radiation, average air temperature, day length, average dew point temperature, average daytime temperature, average nighttime temperature, and average windspeed.

Photosynthesis in a northern ecosystem (a coniferous forest) is modeled by:

$$\frac{\lambda \beta h\left(T\right) X_1}{\alpha \rho_s G} ln \left[\frac{\lambda_{p=1/2} + Re^{-\alpha G}}{\lambda_{p=1/2} + R}\right]$$

where

λ	= average day length
β	= rate constant for photosynthesis
$h\left(T\right)$	= effect of temperature on photosynthesis
α	= light attenuation coefficient
ρ_s	= stomatal resistance to CO_2 and water transfer
G	= total foliage carbon
$\lambda_{p=\frac{1}{2}}$	= light intensity where $P = 0.5P_{max}$
R	= average visible radiation

The difference in the relationships of photosynthesis to the external driving variables demonstrates the difficulty in predicting CO_2 exchange functions for high northern latitudes where carbon flow processes are limited by available water, light, and temperature. The basic terrestrial biosphere module is based on previously existing site-specific ecosystem models mentioned in chapter 1. In these models, a basic ecosystem is divided into several (10 - 30) compartments corresponding to physical properties of the system.

In the general case, a model is represented by a set of compartments, or reservoirs, and fluxes between them. The fluxes are represented by equations such as:

$$\frac{d[n_i]}{dt} = \Sigma k_{ij} N_j + \gamma_i$$

where N denotes the mass of carbon in the its reservoir, t is the time, γ_i represents the addition of carbon to the i^{th} reservoir from an external source such as biomass burning or fossil fuel combustion, n is the number of compartments in the system, and k_{ij} is the transfer coefficient. The physics of the model is contained in these transfer coefficients. The ecosystems represented in the terrestrial biosphere module are listed in table 5.2. The driving variables for these models are listed in table 5.3.

These models are particularly well suited toward the goal of a global terrestrial ecosystem model with seasonal variability. The models in the terrestrial biosphere module have all been previously validated, and they all predict CO_2 exchange as a function of ecosystem-specific parameters and external driving variables.

In order to arrive at a meaningful prediction, some method of extrapolation from small, site-specific CO_2 exchange to larger, regional CO_2 exchange must be implemented, since the model resolution of 5 degrees by 5 degrees exceeds the regional model scale. Typically, this involves expressing the model parameters as spatially distributed random variables whose exact functional forms are unknown. In this case, however, since the model parameters are known at a finer resolution than the 5 degree by 5 degree model grid size, the expressions for regional CO_2 exchange can be evaluated directly. This aspect of the model would be useful for evaluating CO_2 exchanges over very large regions, while minimizing errors introduced from averaging schemes. In the present case, however, the extrapolation scheme serves to reduce computational time spent in the ecosystem module.

The validity of the extrapolation from local site-specific CO_2 exchange functions to a global CO_2 exchange function rests on the following four assumptions. First, that a significant portion of the global terrestrial biosphere has been represented by the collection of models. Secondly,that most biogenic trace gas fluxes arise from well defined biological processes such as photosynthesis and respiration that are defined for specific ecosystems. Thirdly, that the distribution of ecosystems is specified over the modeled region. Fourthly, that these variables are controlled by external climatic forcings which are also defined over the region being modeled. All eight models which comprise the terrestrial biosphere module satisfy these criteria. The method of extrapolation incorporated into the terrestrial biosphere module is as follows:

Given a region R of an area A that is spatially heterogeneous, a model can be defined as follows:

$$y = f(x, p, z)\, a$$

where y represents the process of interest, in this case CO2 exchange, and a represents the area of validity of the individual site-specific ecosystem model within the region R. In the model, these correspond to:

R	= a 5 x 5 grid box
a	= a 1 x 1 subbox of R
x	= model state variables
p	= model parameters
z	= external driving variables

for any site. a, x, p, and z are constant but they vary from site to site in R.

Y, the regional equivalent of y, can be expressed as $Y = \Sigma f(x,p,z)g(x,p,z)$ where f(x,p,z) is the model and g(x,p,z) is the joint PDF. x and p are assumed known from the fine scale ecosystem data base, while an expression for g(z) is derived from the climatological data sets.

A and B are described by the ecosystem data base, and g(z) is estimated from the variability of the driving variable data. These processes are controlled by certain driving variables external to the system being modeled. Examples of such variables include temperature, rainfall, and available photosynthetically active radiation. If these variables are reasonably well defined, and if the individual models are sound, then an extrapolation from local to regional carbon dynamics is feasible. To this end, models in which carbon fluxes are determined by external climatic driving variables are selected over those models in which seasonal carbon dynamics is driven by rate coefficients specific to a given location or data set. Carbon processes represented in the ecosystem models are photosynthesis, respiration, carbon allocation,net primary production, and decomposition. The models used here are outlined in figures 5.3 - 5.10.

Photosynthesis, the incorporation of atmospheric CO_2 into terrestrial vegetation, is represented by an equation of the form:

$$P = P_{max} f\left(l, T, p\right)$$

where P is the photosynthesis represented in the module as the uptake of CO_2, and f is a function of variables such as light, temperature and precipitation. Temperature and soil water are the primary environmental driving variables that control respiration in terrestrial ecosystems. For the ecosystems modeled, the following general equations were used to calculate respiration:

$$\Phi_{0,i} = K_1 \left(T_{opt} - T\right) exp\left(T_{opt} - T \; over K_2\right)$$

$$\Phi_{0,i} = K_i f\left(T, M\right) X_i$$

where K_i are rate constants, T_{opt} is an experimentally determined optimal temperature, $\Phi_{0,j}$ is the respiration due to compartment j, X_j is the amount of carbon in compartment j, and $f(T)$ describes the temperature dependence of respiration as experimentally determined, adn varies from one ecosystem to another.

Carbon allocation is defined to be the flow of carbon from leaves to the other model compartments. This flow is represented by first order diffusion equations with time dependent coefficients:

$$\Phi_{1,2} = n_1\theta_{1,2}(t)\xi_{1,2}$$

where $\Phi_{1,2}$ is the translocation of carbon from leaves to another compartment, n is the amount of carbon in the leaves, θ is the time dependent factor representing the seasonality of the process, and ξ is an ecosystem dependent constant representing the maximum rate of translocation. Net primary production is defined to be the amount of atmospheric CO_2 stored in an ecosystem over a specified time interval. Decomposition is dependent upon three variables: the amount of material available; the temperature; and the available soil water:

$$D = f(T, W)X_i$$

The ecosystem models are all represented as sets of coupled differential equations to be solved numerically. The variable of interest is atmospheric CO_2 exchange. Once this is computed, it is stored for later retrieval by the atmospheric advection algorithm. The ecosystem models take as their input the atmospheric CO_2 concentration (output from the advection module) and, along with other external input, return a net exchange of CO_2 with the atmosphere.

Plots for the average monthly driving variables temperature and rainfall are shown in figures 5.11 - 5.22.

Figure 5.1 Atmospheric CO_2

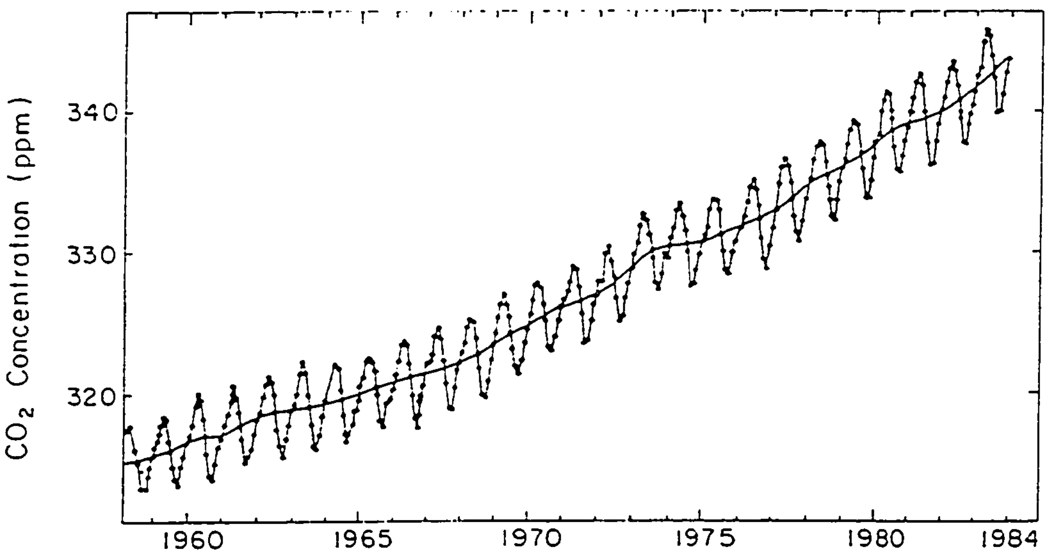
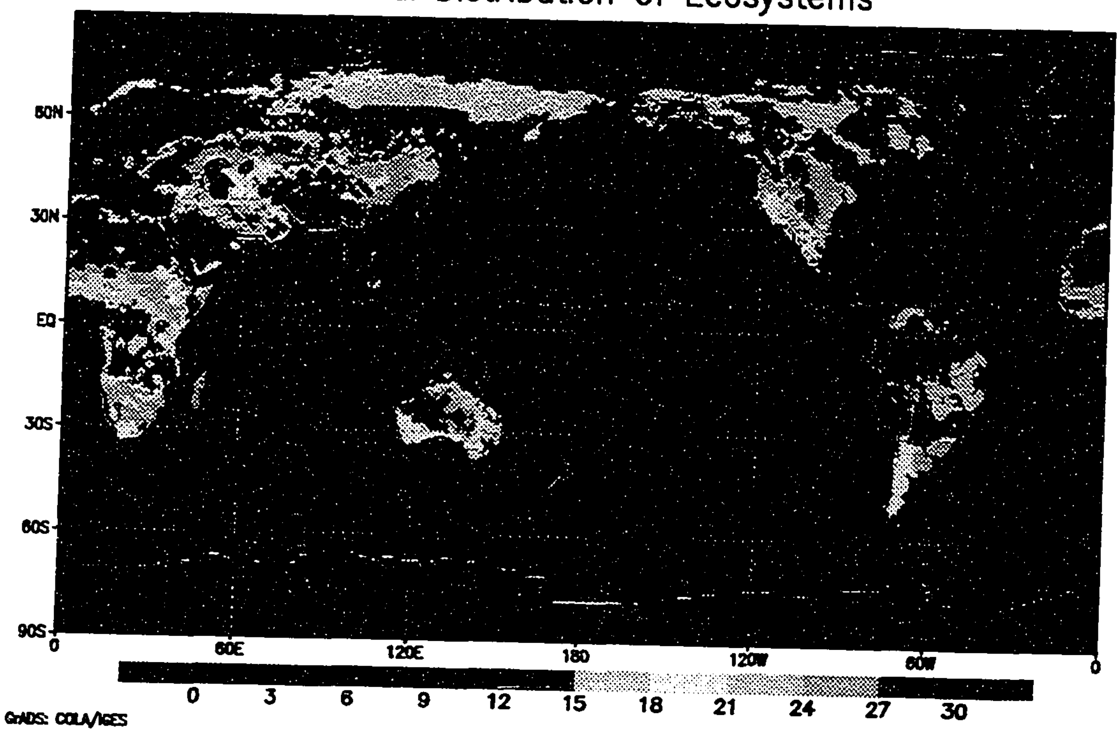


Figure 5.2 Matthews Data Set

Global Distribution of Ecosystems



01-03 Tropical/Subtropical Forest
04-06 Temperate Evergreen Forest
07-09 Tropical Evergreen Forest
10-12 Cold Deciduous Forest/Mixed Woodland
13-15 Woodland
16-18 Cold Woodland/Shrubland
19-21 Cold Shrubland
22-24 Sry Shrubland/Tundra
25-27 Grassland
29-31 Weeds/Desert/Ice

Figure 5.3 Temperate Deciduous Forest (i) Model

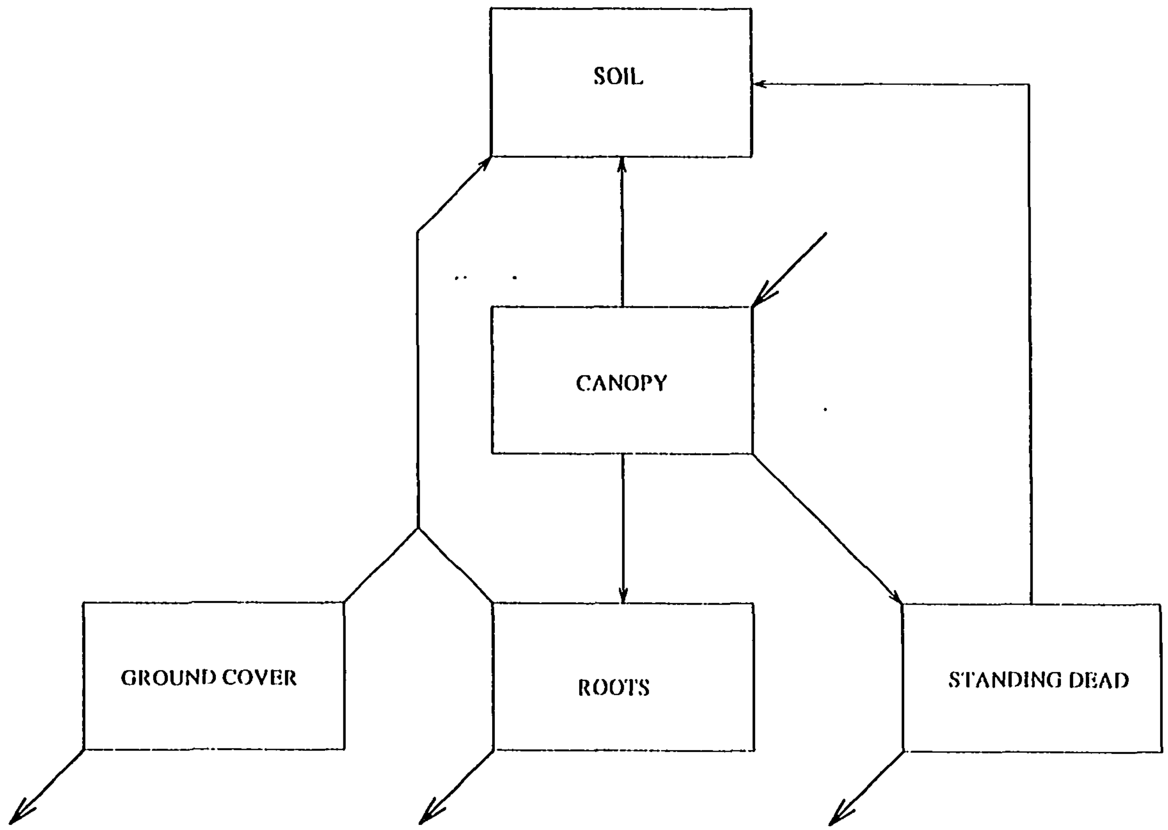


Figure 5.4 Temperate Deciduous Forest (ii) Model

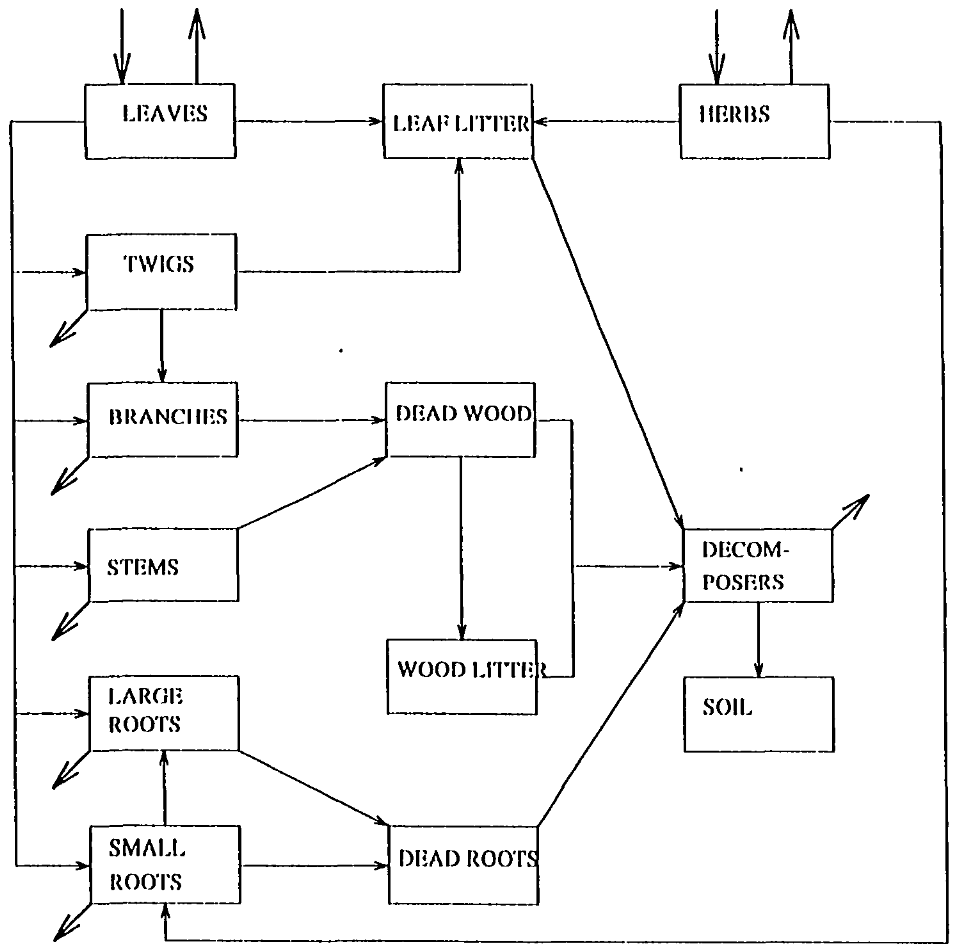


Figure 5.5 Tropical Deciduous Forest Model

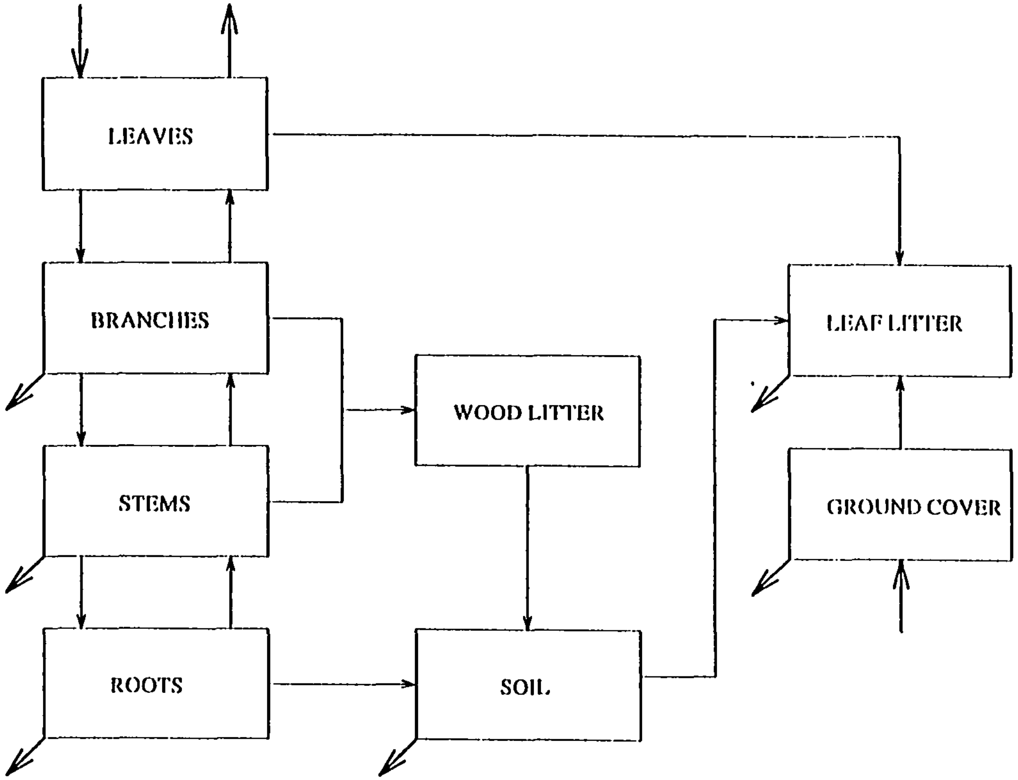


Figure 5.6 Northern Coniferous Forest Model

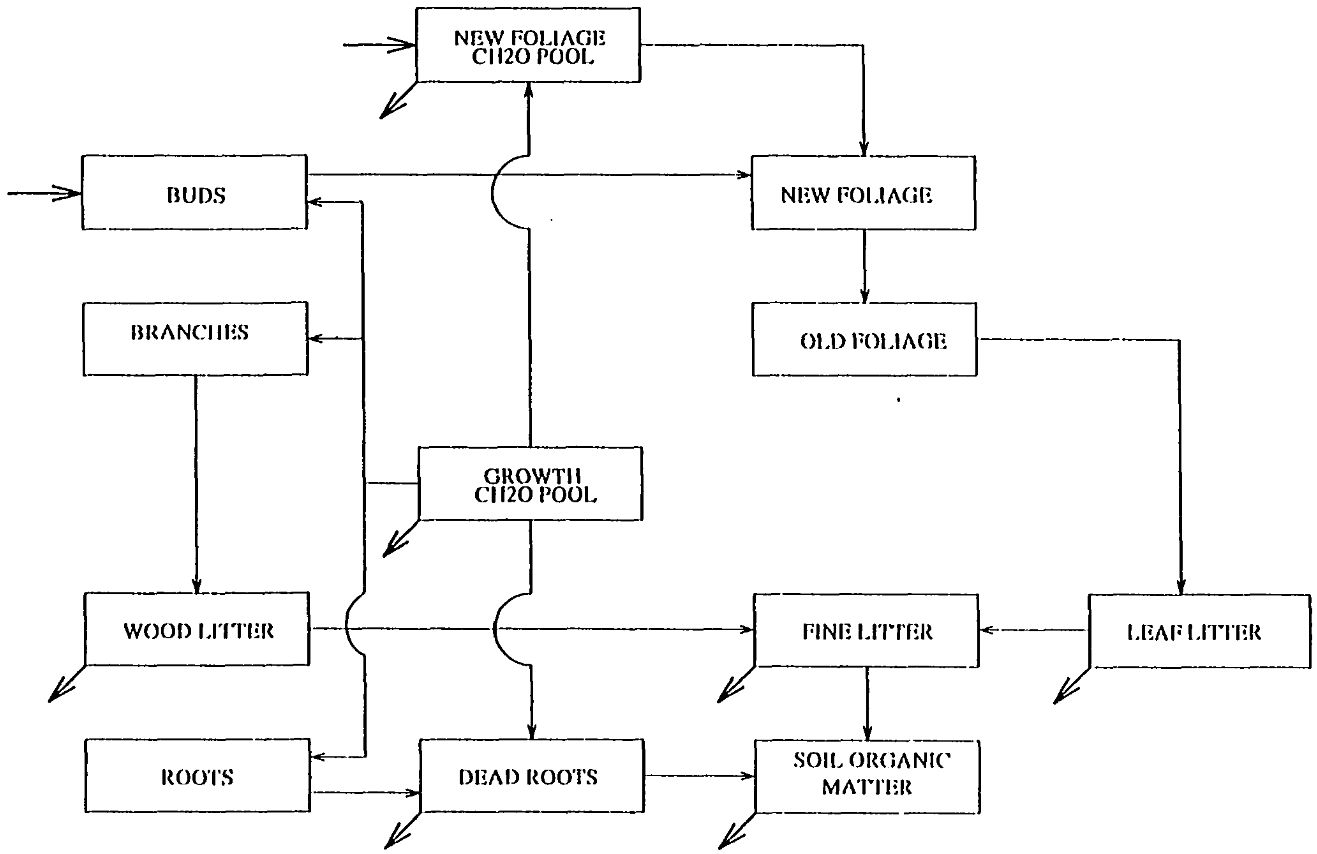


Figure 5.7 Temperate Evergreen Forest Model

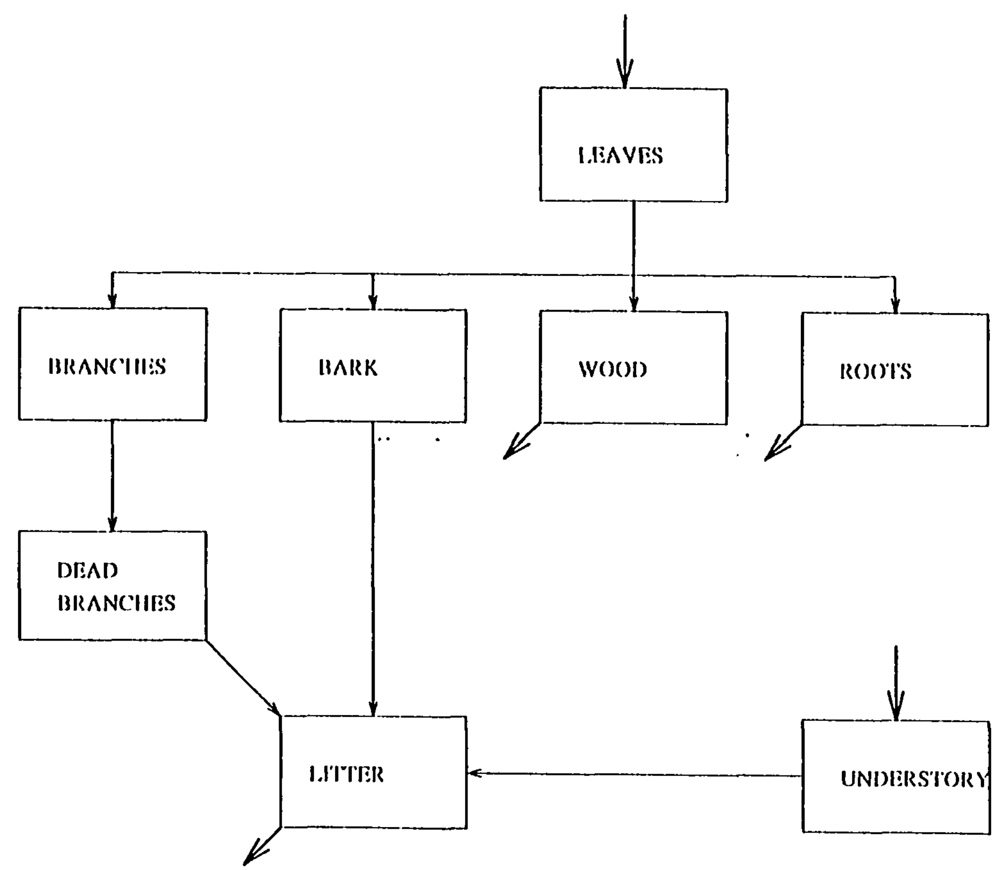


Figure 5.8 Tropical Rainforest Model

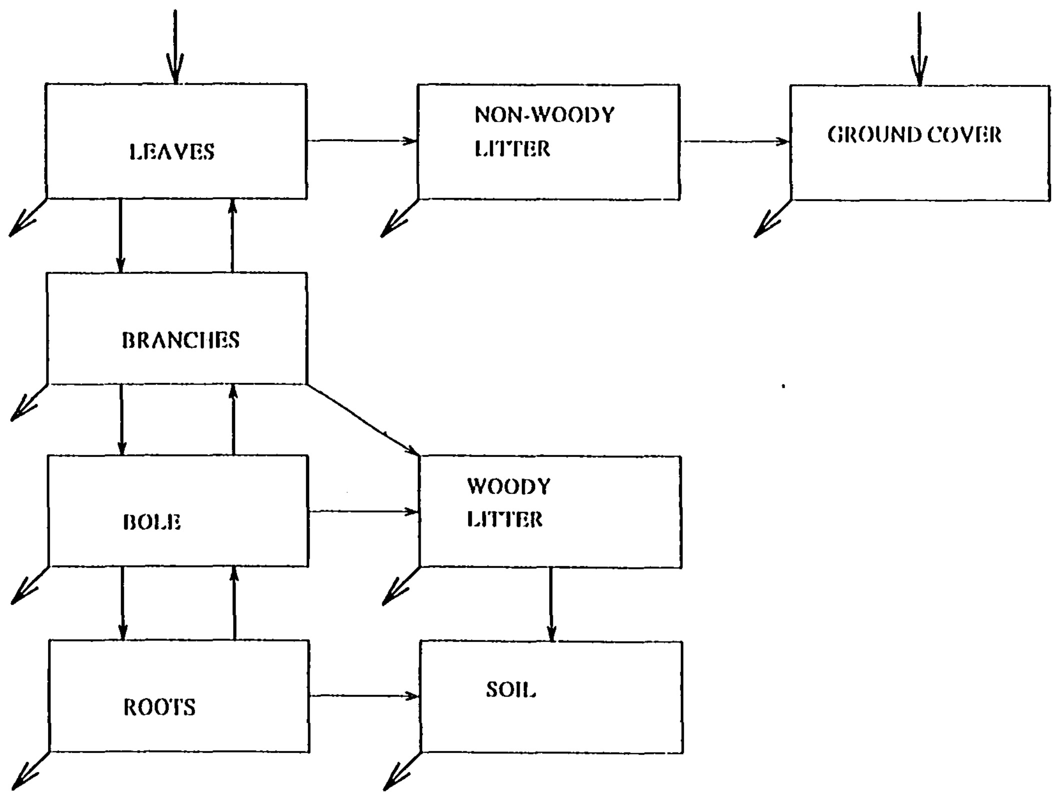


Figure 5.9 Grassland Model

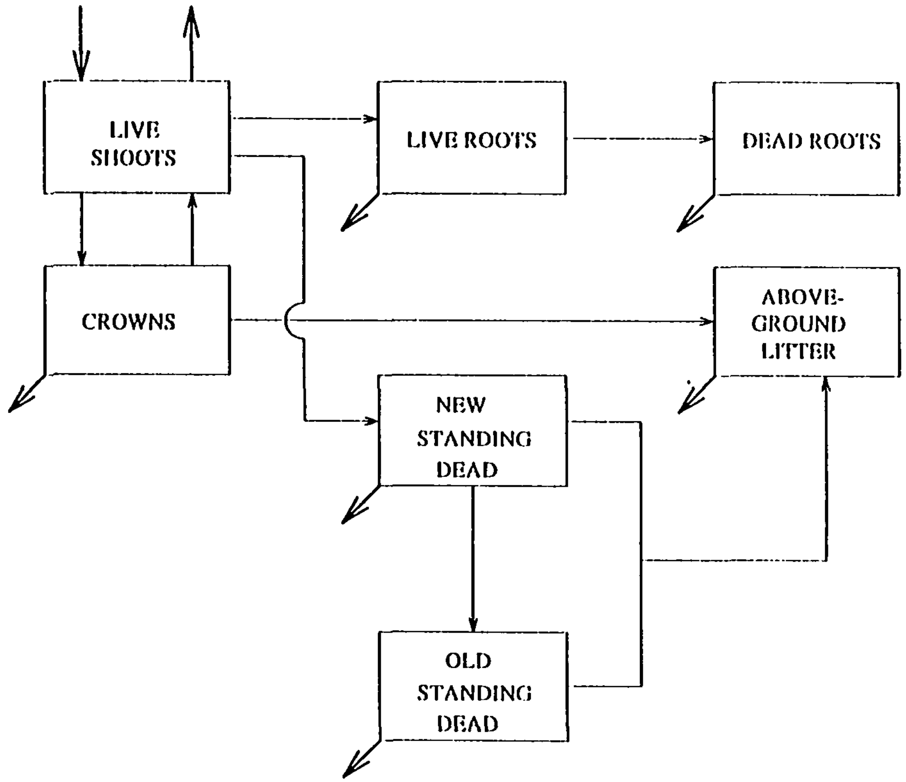


Figure 5.10 Arid Lands Model

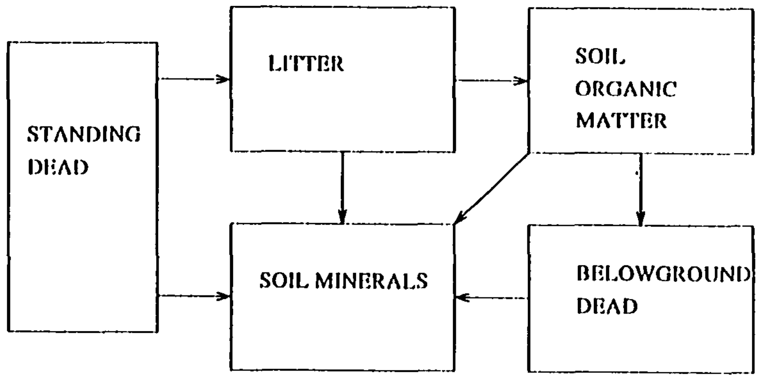
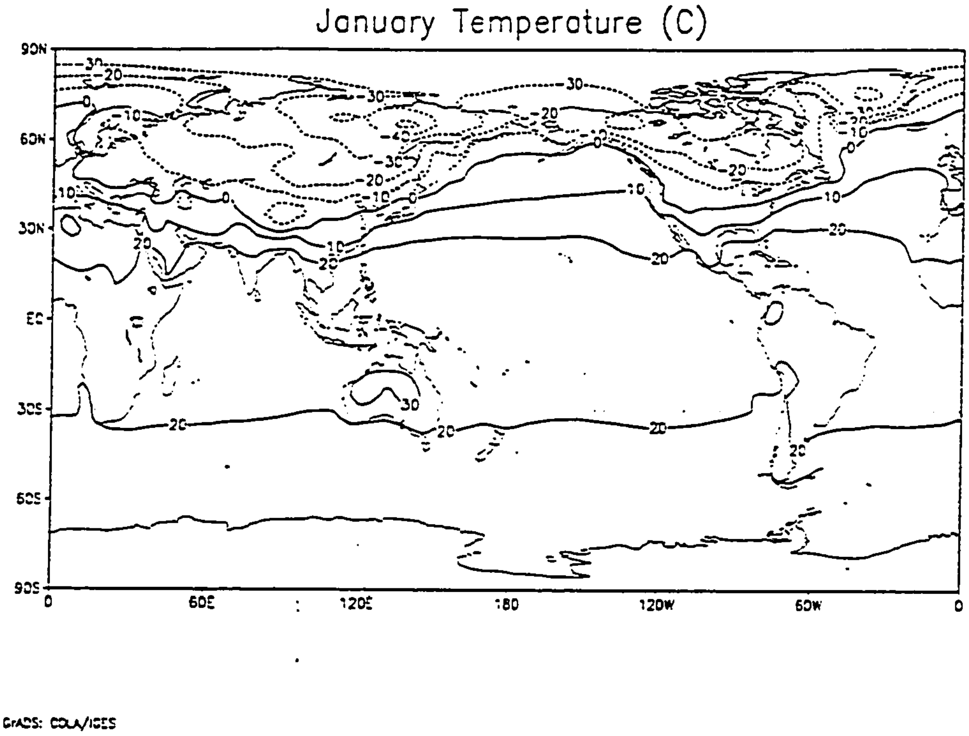


Figure 5.11 Ecosystem Driving Variables (Jan.)



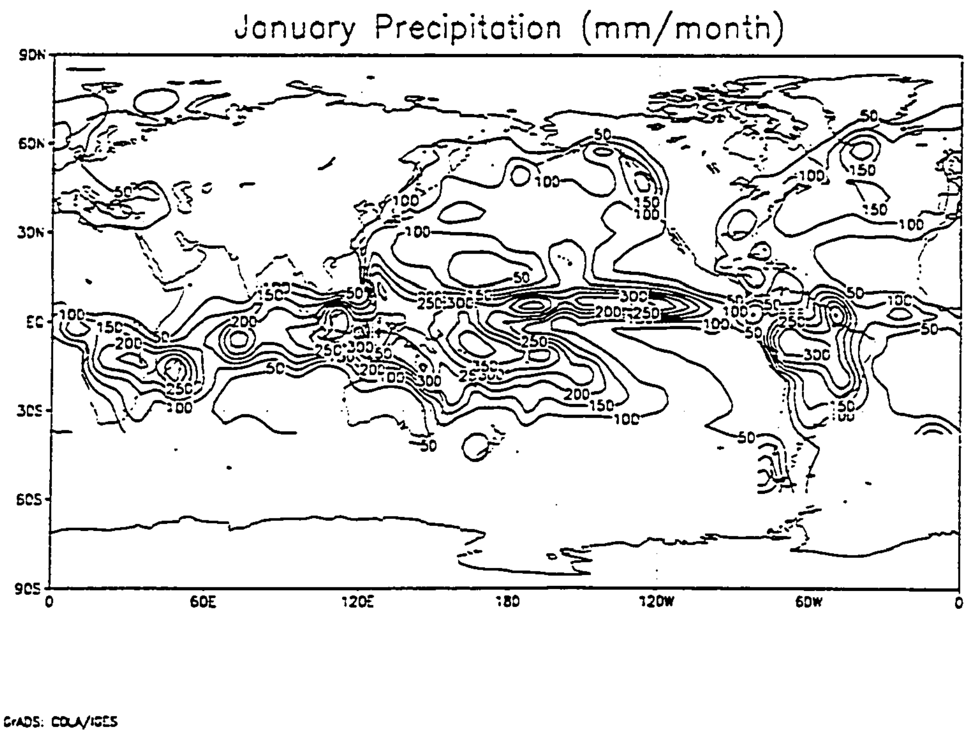
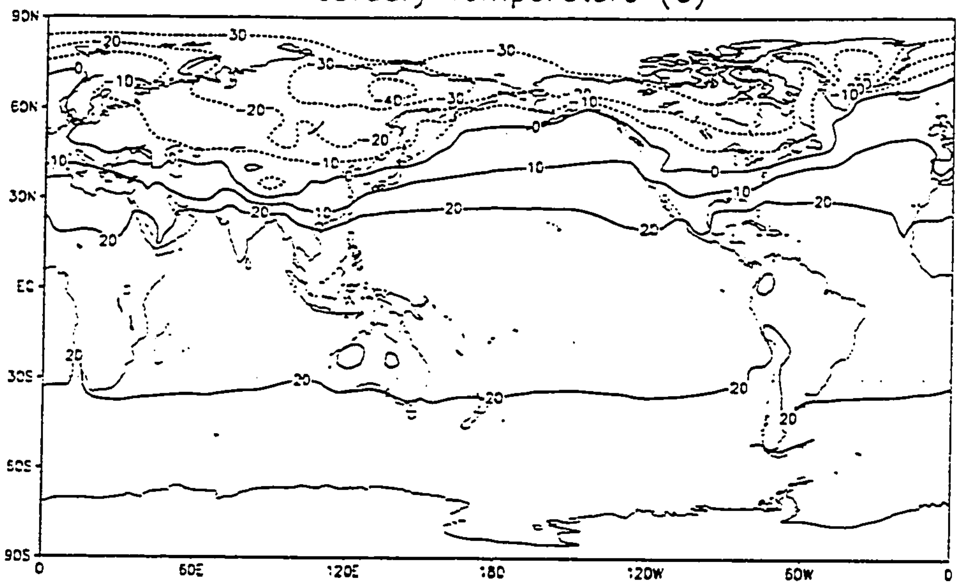


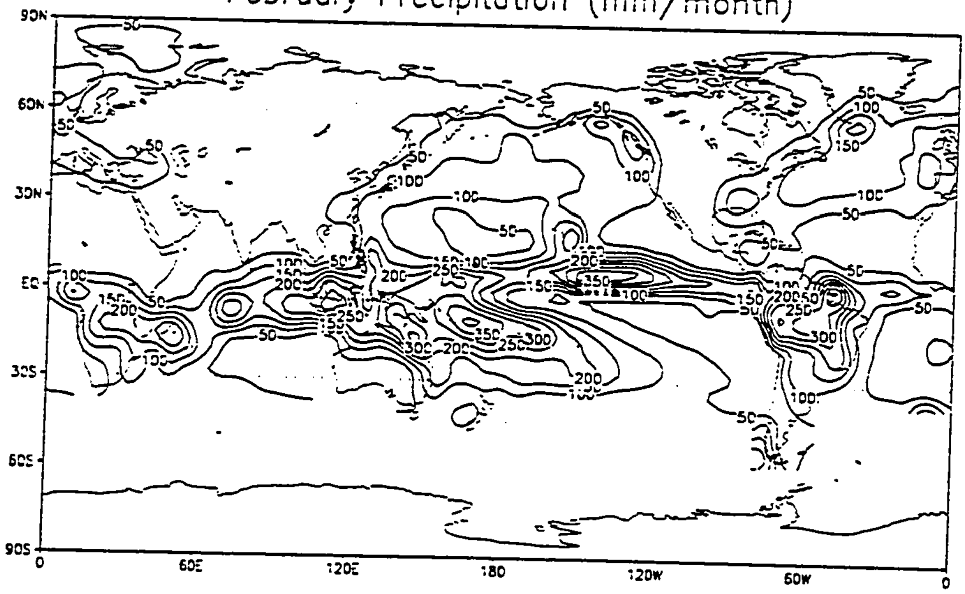
Figure 5.12 Ecosystem Driving Variables(Feb.)

February Temperature (C)



GrADS: COLA/IGES

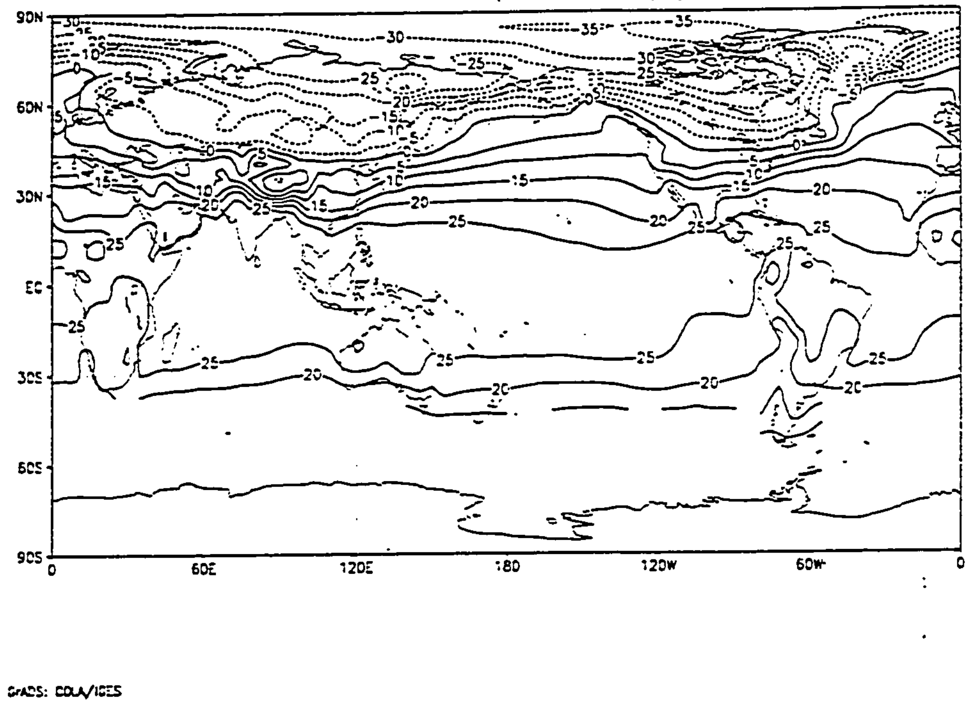
February Precipitation (mm/month)



GrADS: COLA/IGES

Figure 5.13 Ecosystem Driving Variables(Mar.)

March Temperature (C)



March Precipitation (mm/month)

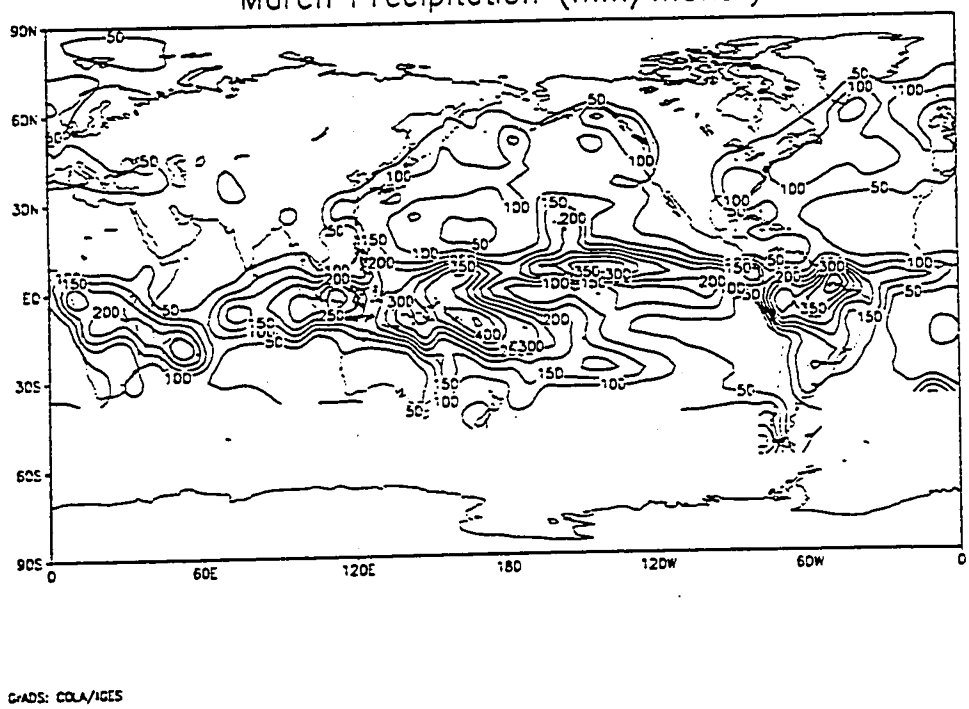
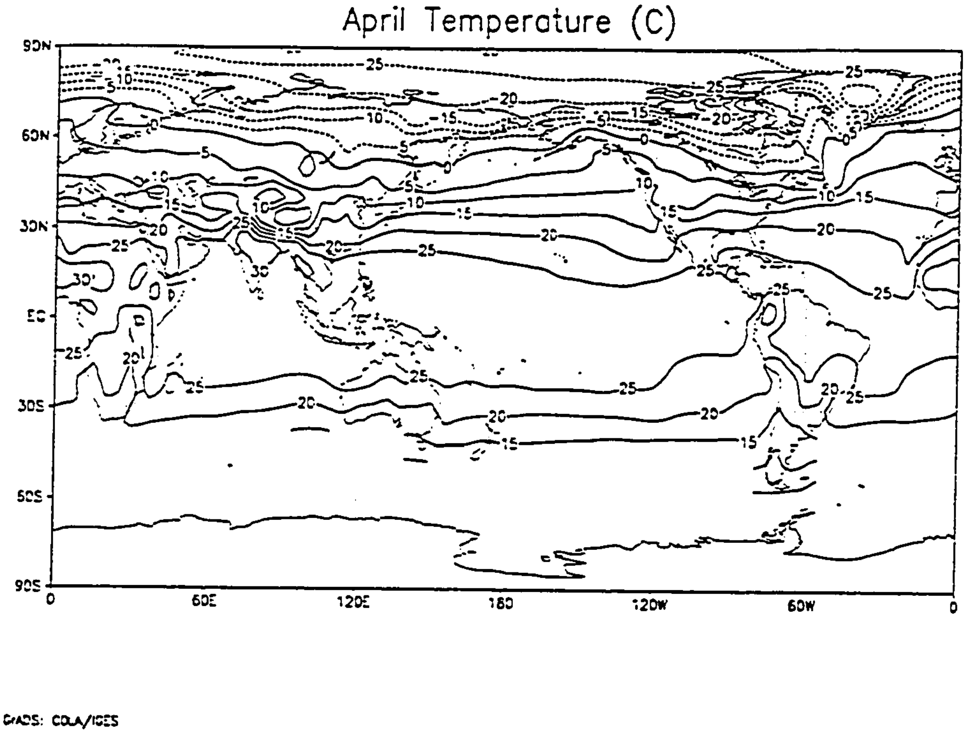


Figure 5.14 Ecosystem Driving Variables(Apr.)



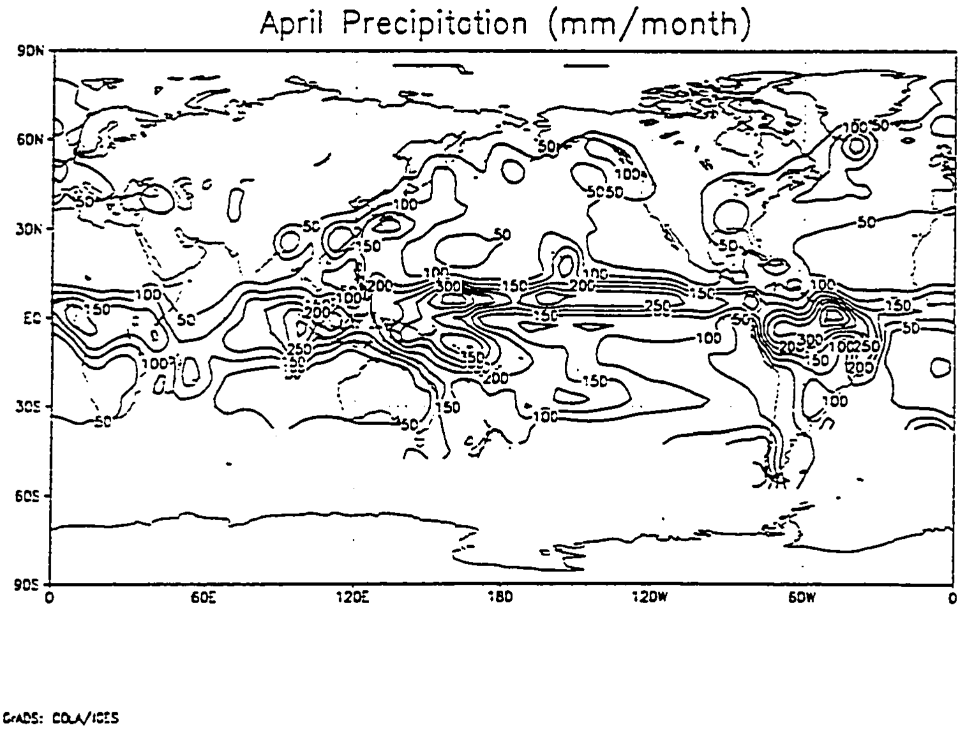
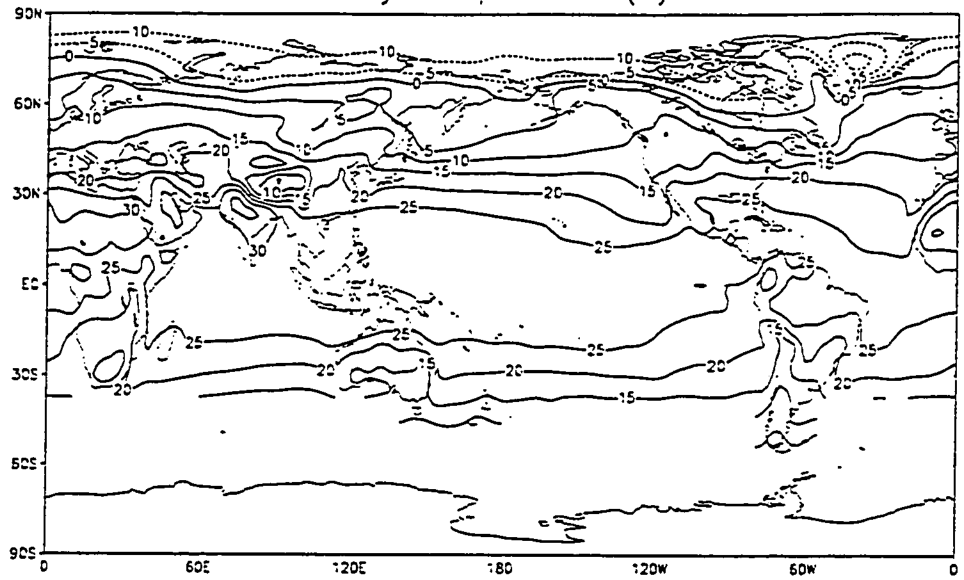


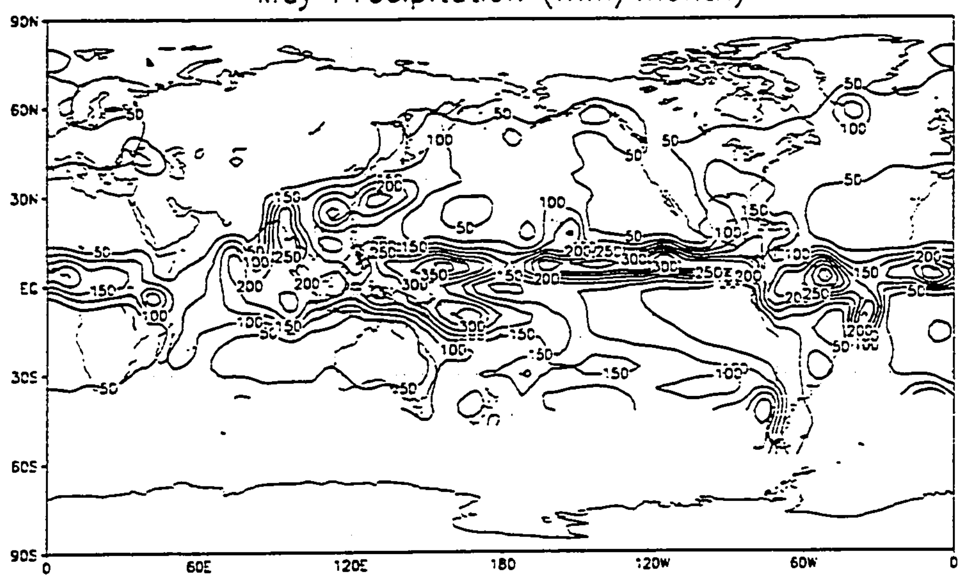
Figure 5.15 Ecosystem Driving Variables(May)

May Temperature (C)



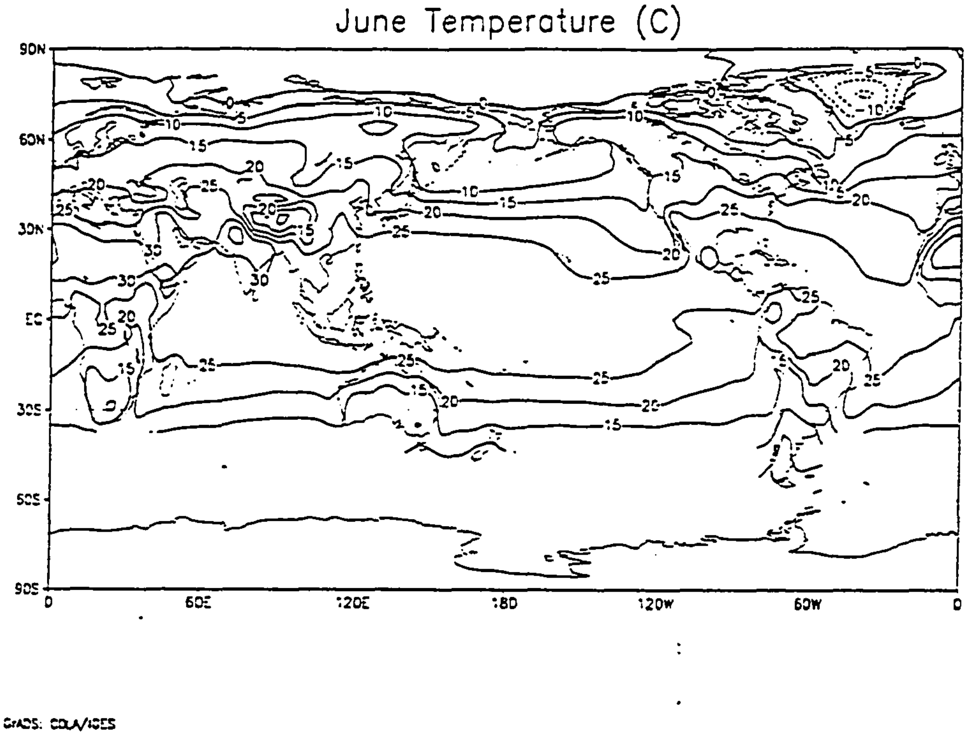
GrADS: COLA/IGES

May Precipitation (mm/month)



GrADS: COLA/IGES

Figure 5.16 Ecosystem Driving Variables(Jun.)



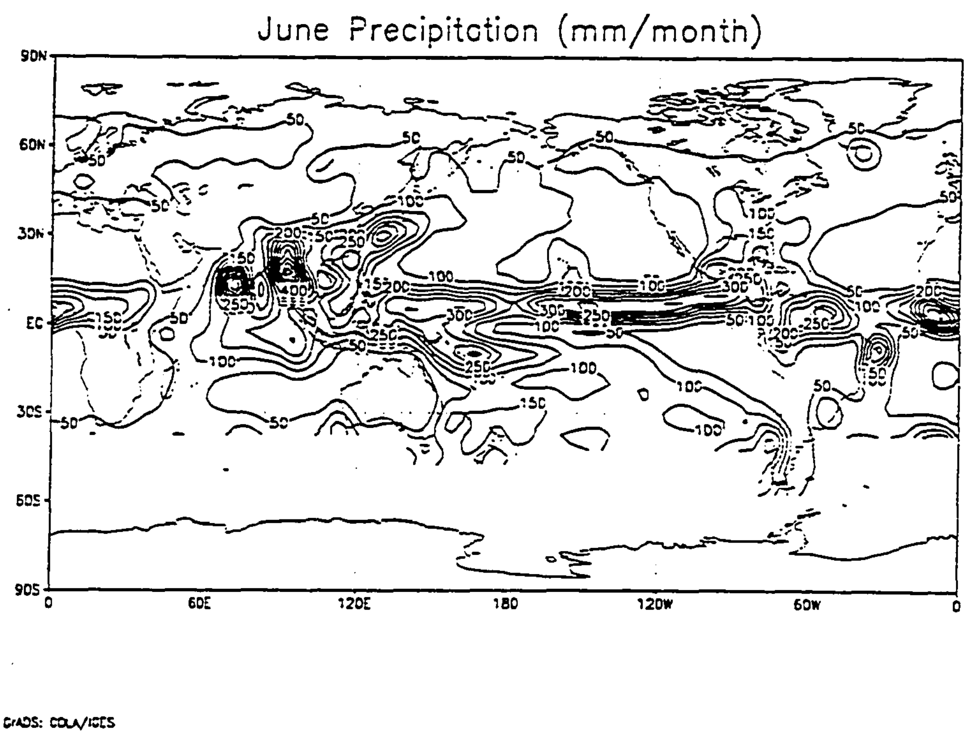
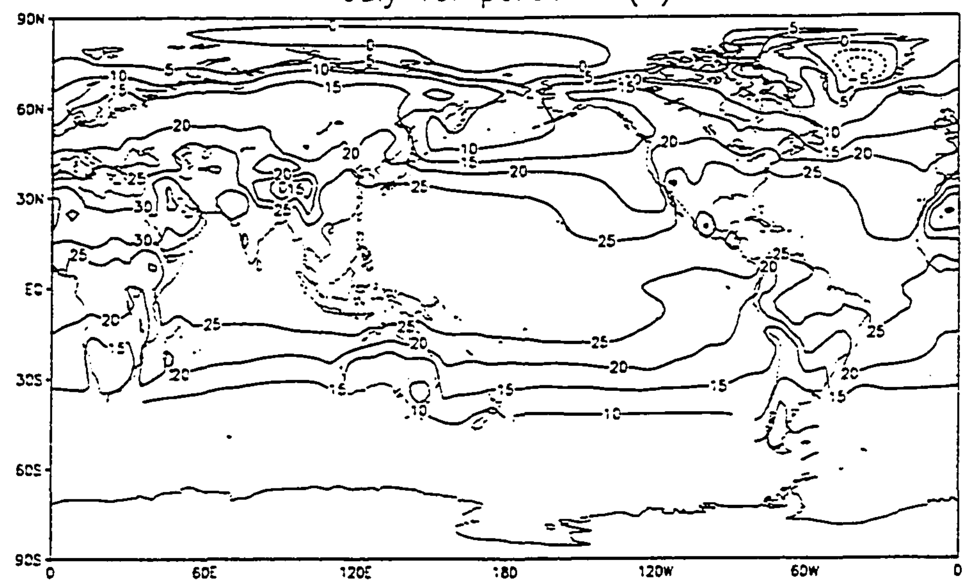


Figure 5.17 Ecosystem Driving Variables(Jul.)

July Temperature (C)



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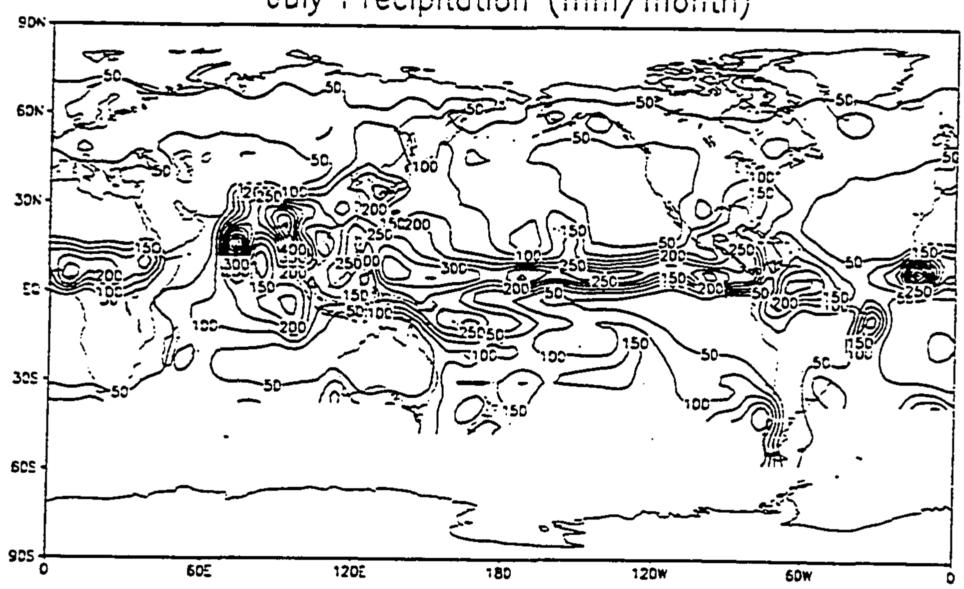
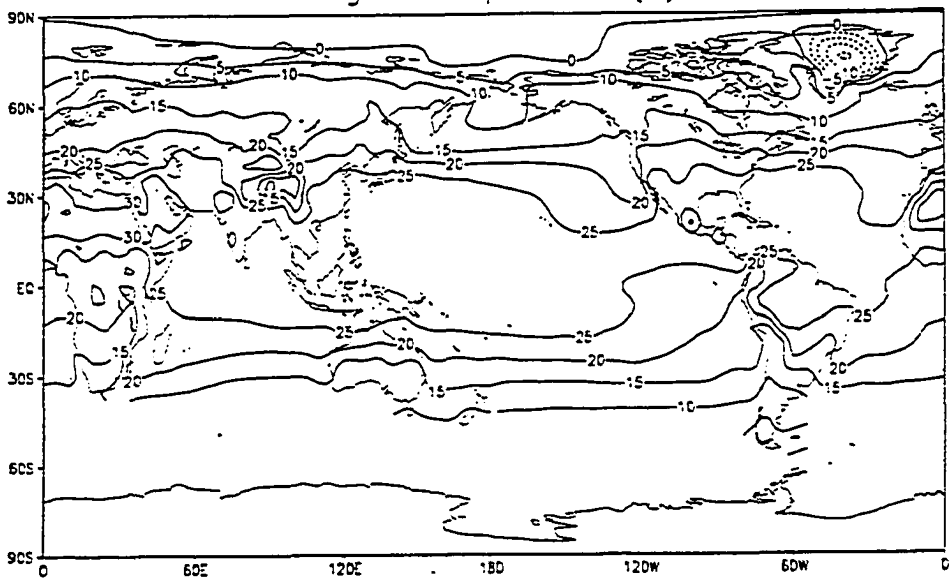
July Precipitation (mm/month)



GrADS: COLA/IGES

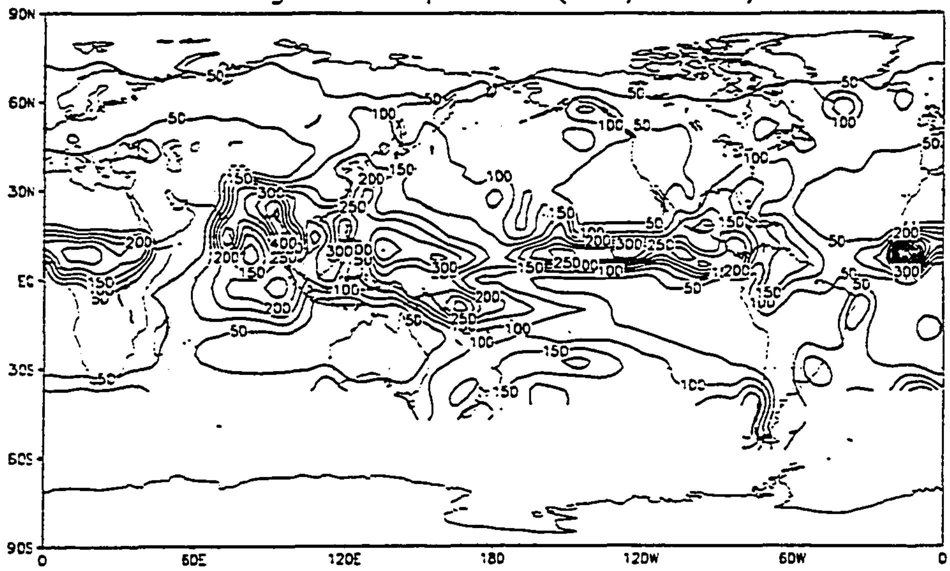
Figure 5.18 Ecosystem Driving Variables(Aug.)

August Temperature (C)



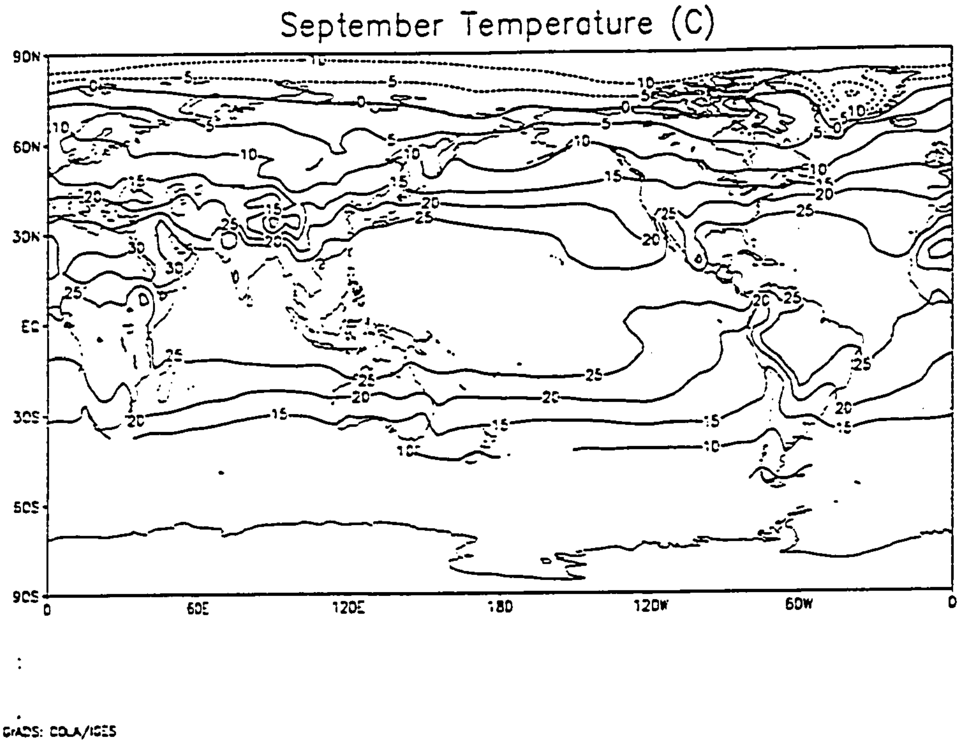
GrADS: COLA/IGES

August Precipitation (mm/month)



GrADS: COLA/IGES

Figure 5.19 Ecosystem Driving Variables(Sep.)



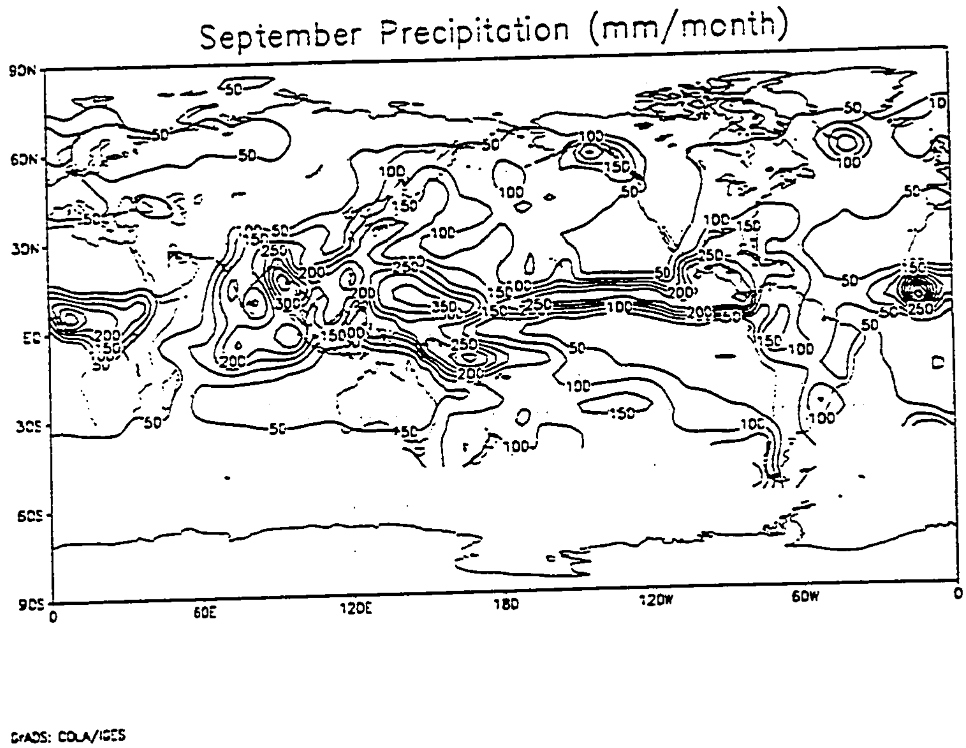
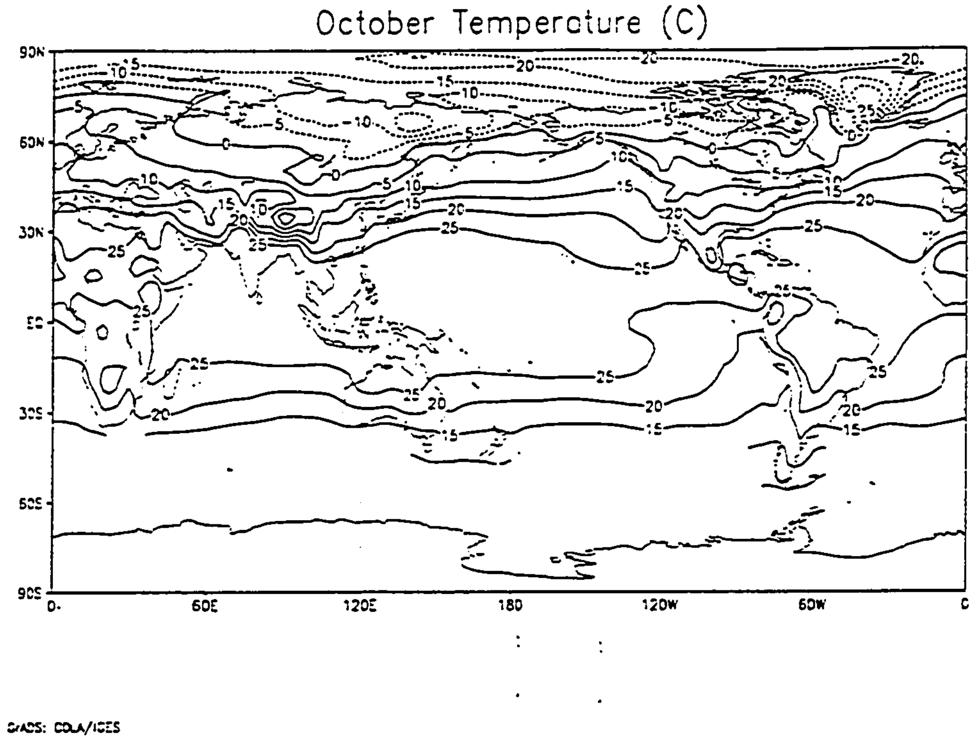


Figure 5.20 Ecosystem Driving Variables(Oct.)



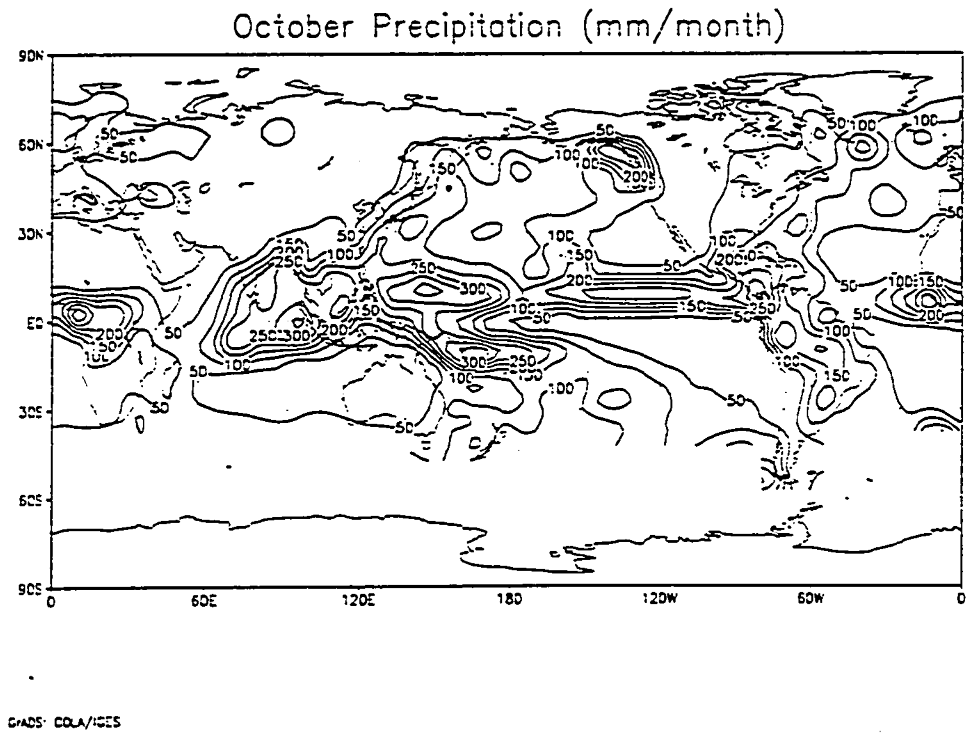
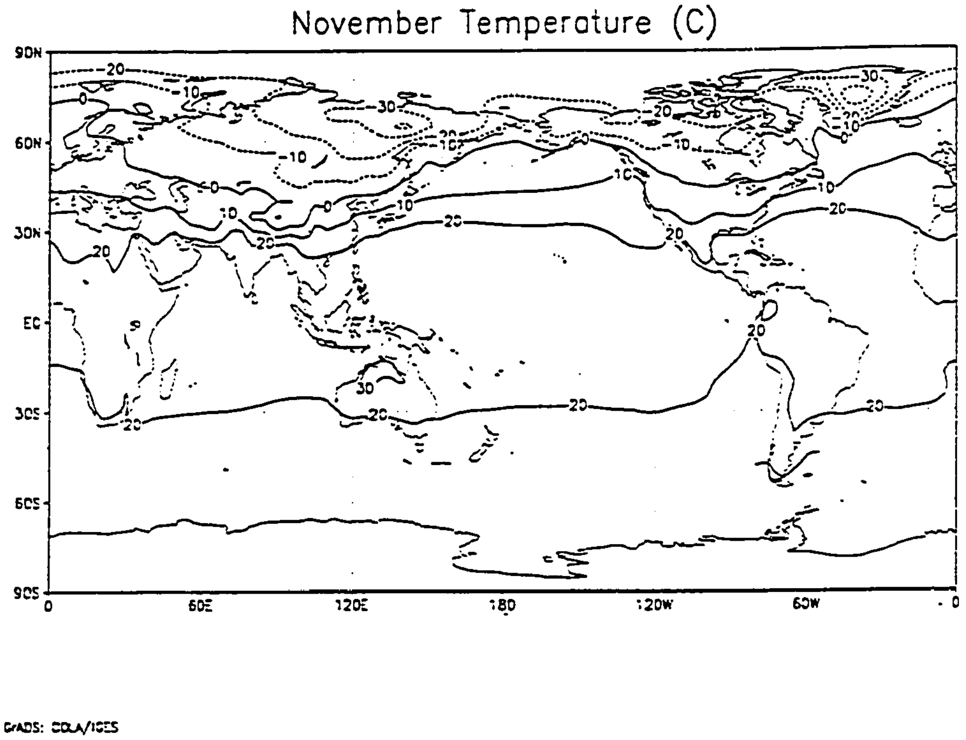


Figure 5.21 Ecosystem Driving Variables(Nov.)



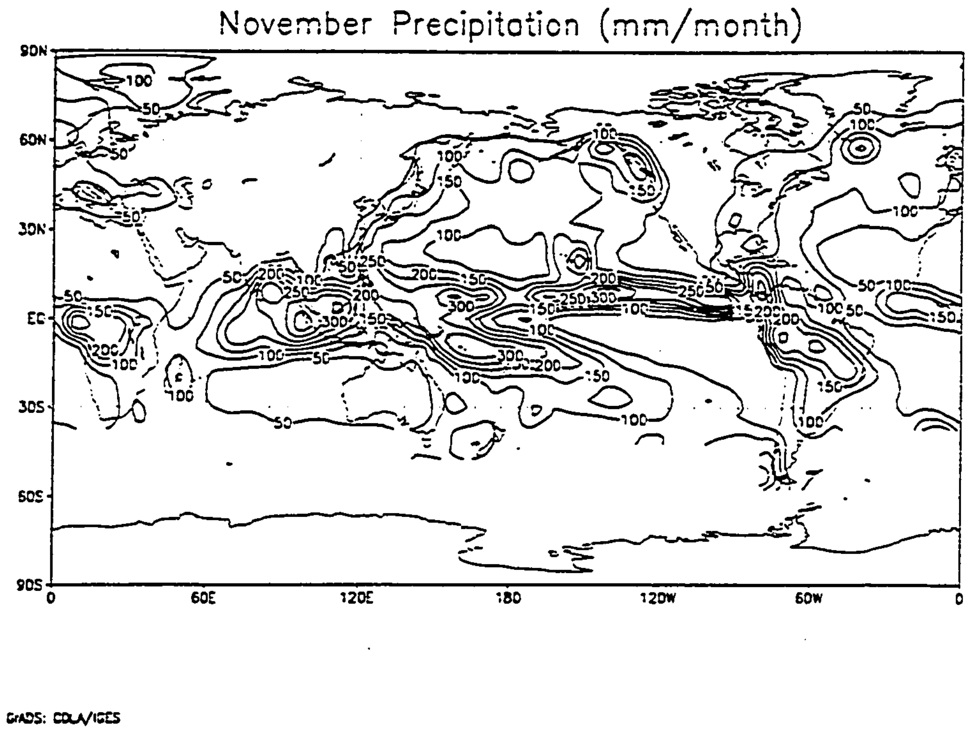


Figure 5.22 Ecosystem Driving Variables(Dec.)

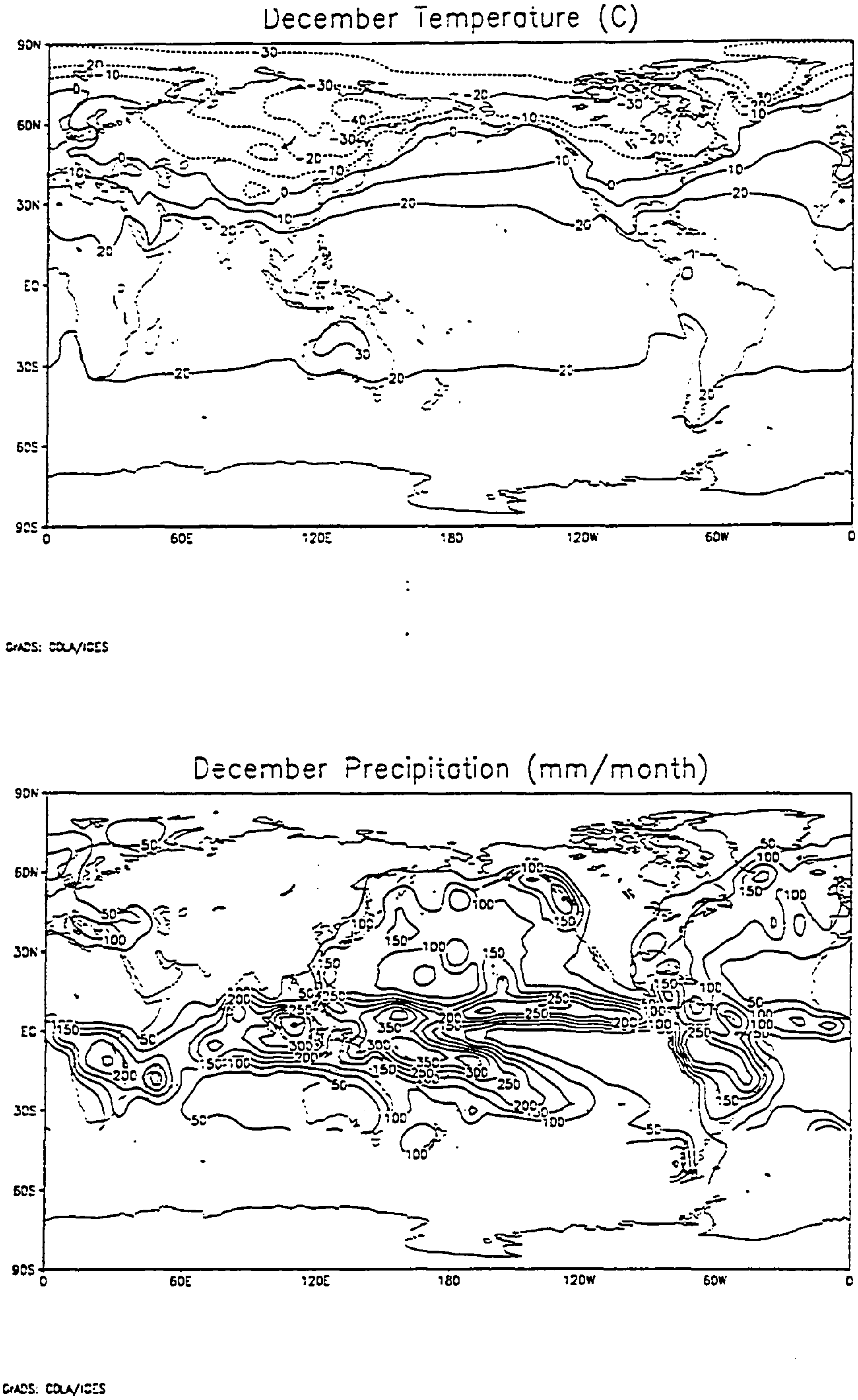


Table 5.1 Carbon Storage in Ecosystems

Biome	Total Carbon (gigatons)
Tropical rainforest	270
Tropical seasonal forest	160
Temperate evergreen forest	160
Temperate deciduous forest	135
Boreal forest	90
Tropical wood/shrubland	27
Temperate wood/shrubland	27
Tropical grassland	26
Temperate grassland	14
Tundra	3

Table 5.2 Ecosystem Classification

Ecosystem Type	Description	Modeled
1	Tropical Evergreen Rainforest	Y
2	Tropical Broadleaved Forest	Y
3	Subtropical Evergreen Rainforest	N
4	Temperate Evergreen Forest	Y
5	Temperate Evergreen Seasonal Forest	Y
6	Broadleaved Evergreen Forest	Y
7	Tropical Evergreen Needleleaved Forest	N
8	Temperate Evergreen Needleleaved Forest	Y
9	Tropical Deciduous Forest	Y
10	Cold Deciduous Forest with Evergreens	N
11	Cold Deciduous Forest	Y
12	Mixed Forest/Woodland	N
13	Broadleaved Evergreen Woodland	N
14	Evergreen Needleleaved Woodland	Y
15	Tropical Deciduous Woodland	N
16	Cold-Deciduous Woodland	Y
17	Evergreen Broadleaved Shrubland	N
18	Evergreen Needleleaved Shrubland	N
19	Deciduous Shrubland	N
20	Cold Deciduous Shrubland	N
21	Dry Shrubland	N
22	Alpine Tundra	
23	Grassland + <40% Woody Cover	N
24	Grassland + <10% Woody Cover	Y
25	Grassland + Shrub Cover	
26	Tall Grassland	Y
27	Medium Grassland	Y
28	Short Grassland	Y
29	Weeds/Broadleaved herbs	N
30	Desert	Y
31	Ice	-
32	Cultivation	N

Table 5.3 Ecosystem Models

Temperate Deciduous Forest (Mixed)
Temperate Deciduous Forest + Shrubs
Cold Coniferous Forest
Temperate Broadleaved Evergreen Forest
Tropical Deciduous Forest
Tropical Rain Forest
Temperate Grassland
Arid Lands

CHAPTER 6: The Ocean Carbon Cycle Model

The atmospheric CO_2 concentration is strongly affected by the ocean atmosphere transfer of CO_2. The ocean presently acts as a net sink for atmospheric CO_2 with a global annual average flux into the ocean of 44% of the anthropogenic emissions of CO_2 (Siegenthaler[38]; Sarmiento[39]; Jahnke[40]). The ocean's ability to sequester atmospheric CO_2 is limited by the following four factors: the exchange of CO_2 across the atmosphere-ocean interface; the chemical buffering capacity of the ocean carbonate system; other chemical and biological ocean processes; and transfer of water between the surface ocean and deep sea. The approach to modeling the ocean carbon cycle taken here is based on the assumption that the state of the ocean carbon cycle, i.e. the distribution of temperature, salinity, and the various chemical compounds involved in the ocean carbon cycle, depends upon the ocean circulation, the chemical and biological processes involving carbon in the ocean, and the exchange of CO_2 with the atmosphere in an interrelated way. The atmosphere-ocean exchange of CO_2 has been extensively modeled as well as experimentally measured (Rintoul[41]; Gemmrich and Hasse[42]; Ariyel[43] et al., 1981). The exchange can be well approximated by:

$$\Phi = \alpha K \left(P - P_a\right)$$

where Φ is the flux between the atmosphere and ocean, K is an empirically determined transfer velocity, α is the solubility of CO_2, P_a is the atmospheric CO_2 partial pressure, and P is the equilibrium partial pressure corresponding to the actual concentration of dissolved CO_2 in the ocean. The gas transfer coefficient, K, is known to increase with increasing wind speed as shown in figure 6.1. However, an accurate empirical relationship is not yet available due to the scarcity of oceanic measurements (Hasse[44]). There is, however, much information regarding the relationship of wind speed to ocean-atmosphere transfer of CO_2 that has been derived from experiments performed in wind tunnels (Jahne[45] et al.). These relations were derived in the laboratory, however, and are difficult to extrapolate to the open ocean. Therefore, the fluxes estimated in this manner may be incorrect by as much as a factor of two. This uncertainty is not as severe as it first seems, however. The ocean's ability to sequester atmospheric CO_2 is controlled primarily by the transfer of carbon from the surface ocean to the deep ocean which occurs on a timescale of years to decades. Hence, the rapid ocean-atmosphere exchange time is not critical to long-term predictions. Short-term fluctuations, though, do depend upon the ocean-atmosphere exchange function. Assuming that the dependence of transfer velocity or wind speed was specified, the problem of computing the partial pressure of CO_2, in surface ocean is reduced to that of calculating the values of temperature, alkalinity, and the concentrations of various dissolved inorganic carbon compounds as follows: the partial pressure for CO_2 in surface water depends upon total carbon, total alkalinity, and temperature. An approximate form is given in (Rosati and Miyakoda[29]):

$$\mu = 4.79 * 10^{-3} \frac{(V-2)}{DZ_1}$$

where V is the average windspeed, and DZ_1 is the depth of the surface box.

Dissolved inorganic carbon is defined to be :

$$C_{id} = [CO_3^{-2}] + [CO_2] + [HCO_3^-]$$

Other chemical and biological processes listed in table 6.1 are coupled to the processes determining PCO_2 through the concentration of dissolved inorganic carbon. These biochemical processes comprise the main part of the ocean biochemical carbon cycle model. The chemical processes modeled, along with the ocean state variables that they control are listed in table 6.1. The ocean biochemical processes represented in the ocean carbon cycle module are as follows: photosynthesis; production of carbonate; oxidation of organic carbon; dissolution of inorganic carbon; and sinking due to gravity of large particles of both organic and inorganic carbon.

Photosynthesis is calculated only in the upper most ocean layer. Net productivity is assumed to follow the following relation (Taylor[46]):

$$NP = \mu f(I)\, g(N, P)$$

where P is photosynthesis, μ is phytoplankton growth rate, f(I) is a light limiting factory, and g(N,P) is a growth function dependent upon available nitrogen and phosphorus. Functional forms for f(I) and g(N,P) are given in table 6.2.

The ocean carbon cycle can be briefly described as follows: The production of new organic carbon causes a corresponding decrease in the available nutrients nitrogen and phosphorus. Ocean carbonate production also occurs in proportion to photosynthesis (Takahashi[47]). The rate of production of carbonate is assumed to deplete dissolved inorganic carbon and alkalinity. Oxidation of organic carbon is proportional to the total amount of organic carbon present. When the organic carbon is oxidized, dissolved inorganic carbon is produced and alkalinity is consumed. Dissolution of inorganic carbon depends on the amount of inorganic carbon present and the depth below which the water is not saturated with inorganic carbon. The sinking of particles under gravitational force is assumed to depend on the concentration of particles only.

The ocean circulation determines the change in concentration of ocean carbon cycle variables in a given region. The ocean circulation is also dependent upon the temperature and salinity fields. The temperature dependence of CO_2 partial pressure implies that in order to predict the solubility of CO_2 in the surface ocean, the circulation needs to be explicitly represented. The general circulation of the ocean determines the temperature, salinity and concentrations of carbon compounds at a given location in the global ocean. These variables also determine the state of the ocean carbon cycle.

Since most of the ocean carbon chemistry takes place in the surface ocean and is on the time scale of years to decades, it is important that the ocean GCM accurately resolve the upper ocean structure. The two critical components of upper ocean circulation are equatorial flow and mixed layer processes. The latter is crucial to an ocean carbon cycle model with horizontal resolution. The ocean circulation module is built upon the Geophysical Fluid Dynamics Laboratory's (GFDL) Modular Ocean Model (MOM). This model has been configured with a horizontal resolution of 4.5 degrees latitude by 3.75 degrees longitude, twelve vertical levels, realistic continental boundaries, and bottom topography. The maximum depth represented in the model is 5000 meters. The ocean model is forced at the surface by observed temperatures, salinities, and wind stresses. This model has been used successfully to predict both steady state distributions of 14C in the world ocean and distributions of bomb produced 14C (Rosati and Miyakoda[29]; Toggweiler[48] et al.). However, no attempts were made to include chemical or biological carbon processes represented in either work.

The ocean circulation module is responsible for advecting the various carbon containing compounds represented in the ocean biochemical module. Temperature and salinity data are also provided to the ocean biochemical module by the circulation model.

In order to specify the atmosphere-ocean exchange of CO_2, it is necessary to either know or predict the following boundary conditions: wind stress; heat and water fluxes; and the gas exchange rate. Also crucial are the interior processes of advection and the mixing, including turbulent transfer, and sinking of large particles due to gravity (Maier-Remier and Hasselman[49]). However, the prognostic variables of the ocean circulation module do not depend upon the state of the ocean carbon cycle. This allows for the ocean state fields corresponding to temperature, salinity, and general circulation to be calculated and stored prior to a carbon cycle model run. This is discussed in chapter 9.

Primitive equation models, such as the MOM, allow the temperature and salinity fields to be predicted. Additionally, the concentrations of the various forms of carbon within the ocean that play a part in the seasonal to decadal timescale carbon cycle are predicted. The governing equations for the MOM are the Navier-Stokes equations modified in the following two respects. First, density differences are neglected except when multiplied by gravity. Secondly, the equation for vertical motion has been simplified by neglecting local acceleration terms. This is known as the hydrostatic approximation. The equations can then be written:

$$u_t + L[u] - 2\Omega n v - \frac{mnuv}{a} = -\left(\frac{m}{a}\right)\left(\frac{p}{\rho_0}\right)_\lambda + F_\lambda$$

$$v_t + L[v] + 2\Omega n u - \frac{mu^2}{a} = -\left(\frac{1}{a}\right)\left(\frac{p}{\rho_0}\right)_\phi + F_\phi$$

where

$$m = sec(\phi)\,; n = sin(\phi)$$

$$u = \frac{a}{m}\frac{d\lambda}{dt}$$

$$v = a\frac{d\phi}{dt}$$

The hydrostatic approximation is:

$$\rho_0 g + \frac{\partial p}{\partial z} = 0$$

and the continuity equation is:

$$\frac{\partial w}{\partial z} + \frac{m}{a}\left(\frac{\partial u}{\partial \lambda} + \frac{\partial (v/m)}{\partial \phi}\right)$$

where we can define L such that:

$$L[\mu] = ma^{-1}\left(\frac{\partial u\mu}{\partial \lambda} + \left(\frac{\partial v\mu/m}{\partial \phi}\right)\right) + \frac{\partial w\mu}{\partial z}$$

and the continuity equation can then be written:

$$L[1] = 0$$

There are also continuity equations for temperature and salinity which are:

$$\frac{\partial T}{\partial t} + L[T] = Q$$

$$\frac{\partial S}{\partial t} + L[S] = \sigma$$

and the equation of state is of the form:

$$\rho = \rho(T, S, z)$$

The biochemical and ocean circulation models are coupled by solving the ocean carbon cycle equations (figure 6.3) on the ocean GCM grid (Fig. 6.2). The ocean carbon compounds are first initialized to observed values, and then are advected as passive tracers within the ocean general circulation model. Since these equations are decoupled from the momentum equations, the tracer quantities have no direct effect upon ocean circulation. Results from the global ocean carbon cycle model in the form of CO_2 exchange plots are shown in figures 6.4 through 6.9

Although there is no direct coupling of ocean physical processes and the ocean carbon cycle, effects of global warning associated with increased atmospheric CO_2 have been predicted. These predictions raise substantial concern that the ocean may lose its ability to act as a sink for CO_2 through a phenomenon known as thermohaline catastrophe (Bryan[50]).

The ocean sequesters most of the CO_2 that enters its surface by the downwelling of various carbon containing compounds to deep waters, then returning the relatively carbon free water through upwelling. This large scale ocean circulation is known as thermohaline circulation, the interruption of which is potentially disastrous as the deep ocean would no longer be able to sequester approximately 2.5Gt of carbon annually. If no other sink is available, this CO_2 will be deposited into the atmosphere. That this phenomena has been predicted indicates the need for a better representation of the time dependent global carbon cycle. In order to make any quantitative predictions regarding thermohaline catastrophe, however, a fully coupled atmosphere-ocean-climate model is needed. Such models do not presently exist.

Figure 6.1 Gas Transfer Coefficient

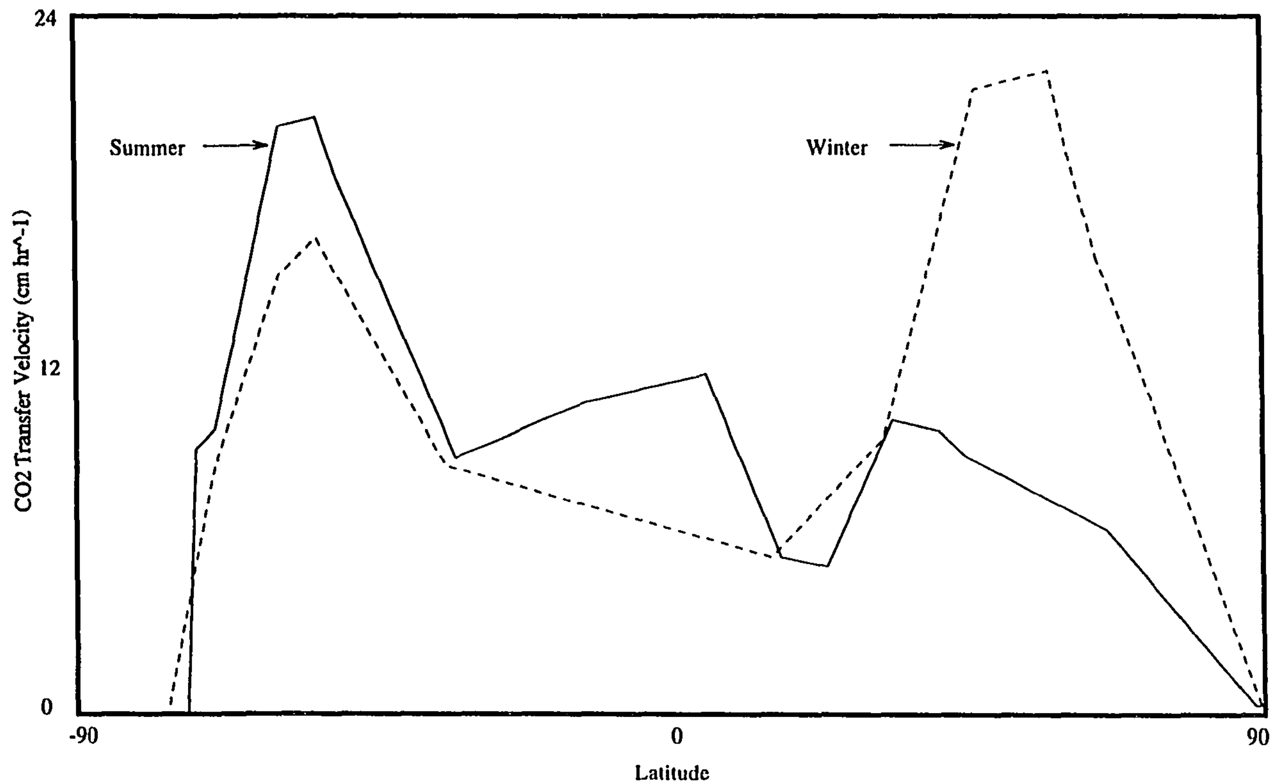


Figure 6.2 Ocean Carbon Cycle

Set of coupled differential equations representing the ocean carbon cycle

$$dn_{[cso]}/dt = P*n + \Phi(cso)$$

$$dn_{[csi]}/dt = P*n*[CaCO_3]/[C] + \Phi(csi)$$

$$dn_{[n]}/dt = \Phi(n) - (16/106)*P*n$$

$$dn_{[cdi]}/dt = -P*n(1 + [CaCO_3]/[C]) + \Phi(cdi) + \beta(P_a, T)*cdi + \gamma(P_a, T)*\alpha$$

$$dn_{[\alpha]}/dt = \Phi(\alpha) + (17/106)*P*n - 2*[CaCO_3]/[C]*P*n$$

$$dn_{[CO2]}/dt = \xi(P_a, T) + \beta(P_a, T)*cdi + \gamma(P_a, T)*\alpha$$

cso : suspended organic carbon
csi : suspended inorganic carbon
n : nutrient (nitrate or phosphate)
cdi : dissolved inorganic carbon
α : total alkalinity

Figure 6.3 Ocean Computational Grid

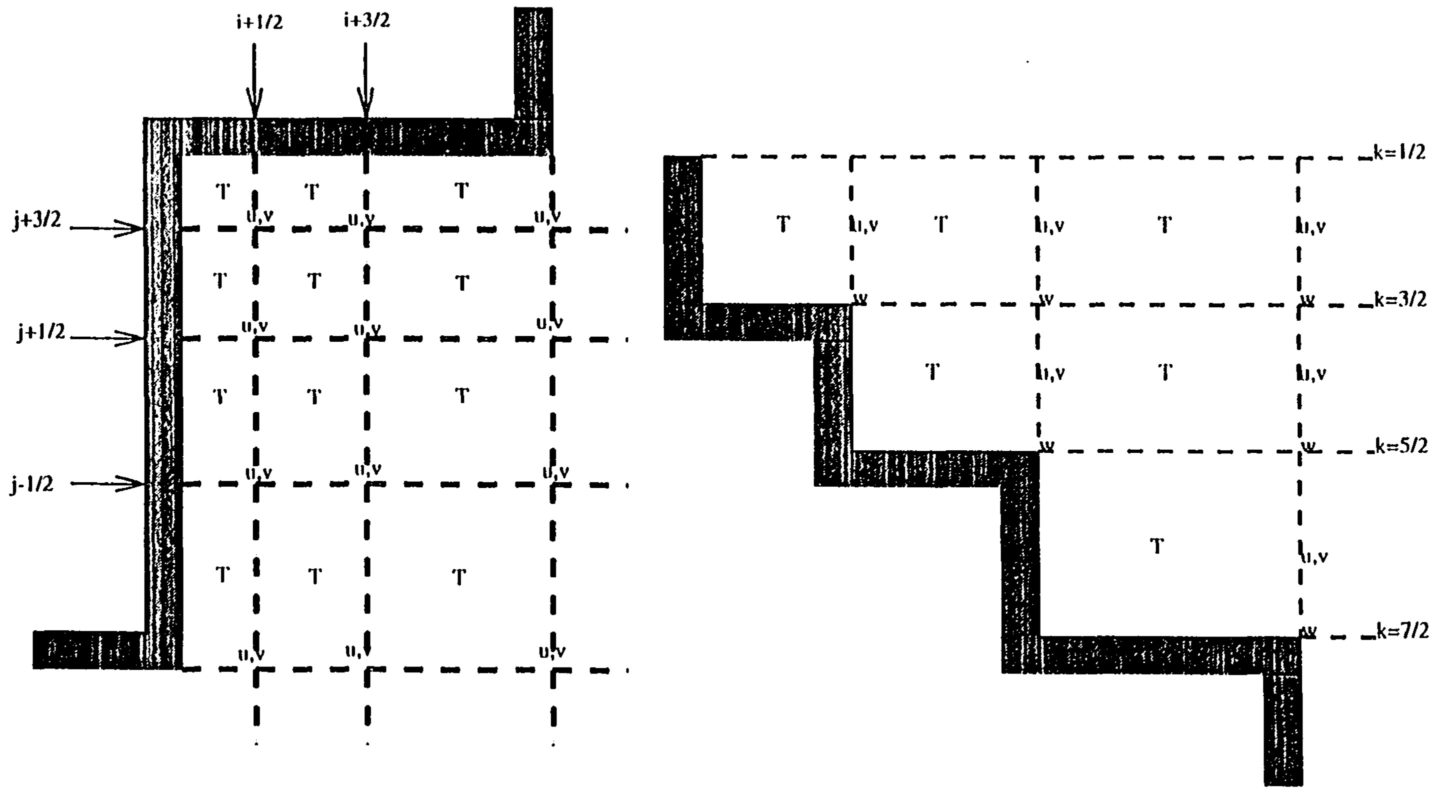
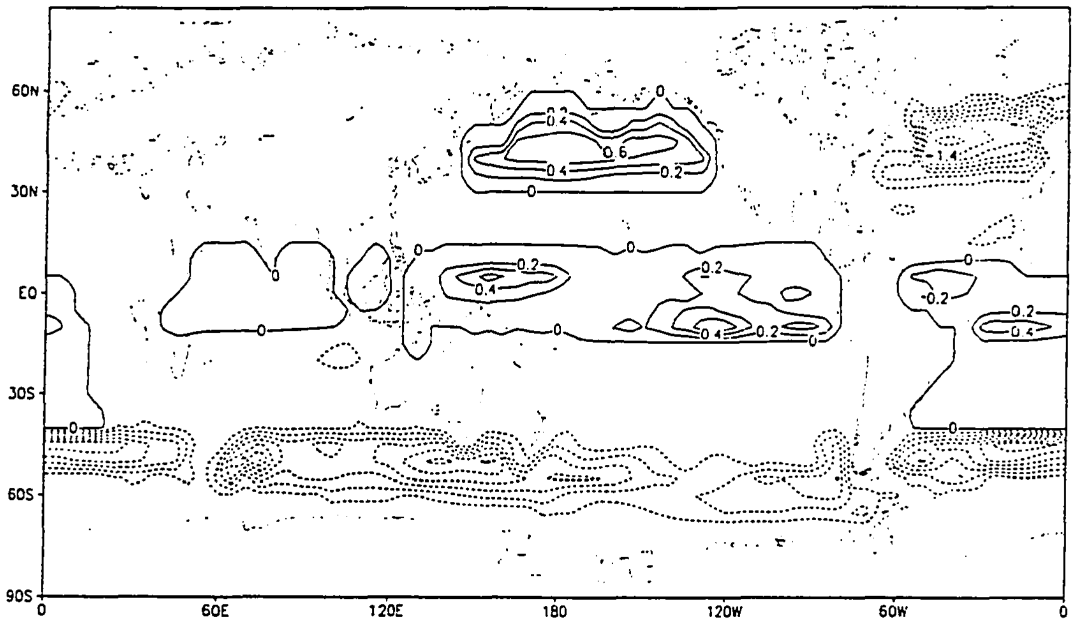


Figure 6.4 Ocean Surface Flux(Jan. - Feb.)

January CO2 Flux



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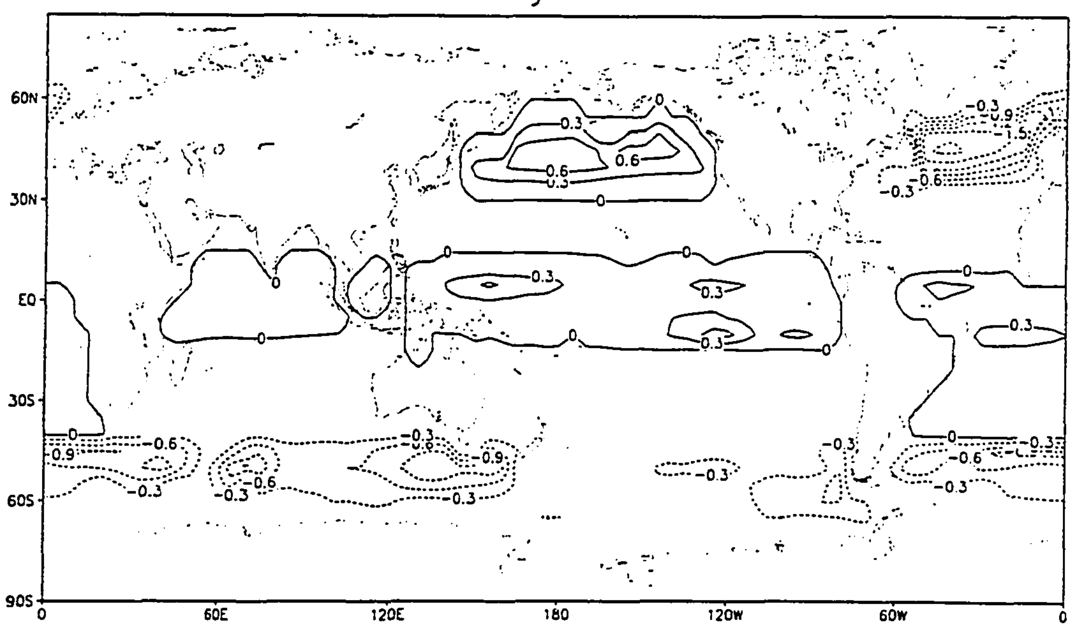
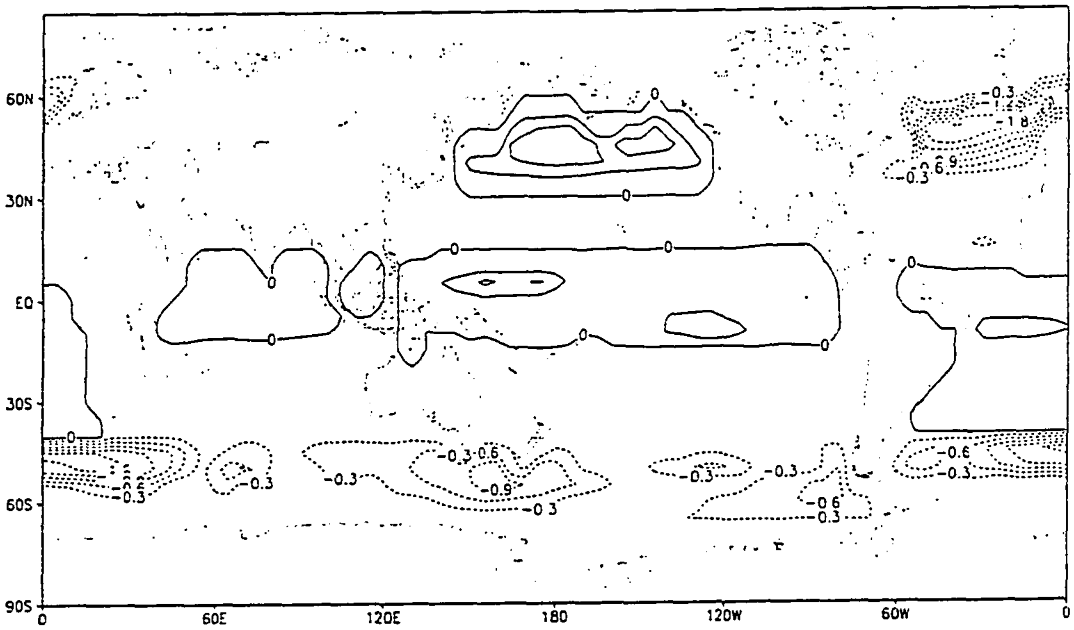
February CO2 Flux



GrADS COLA/IGES

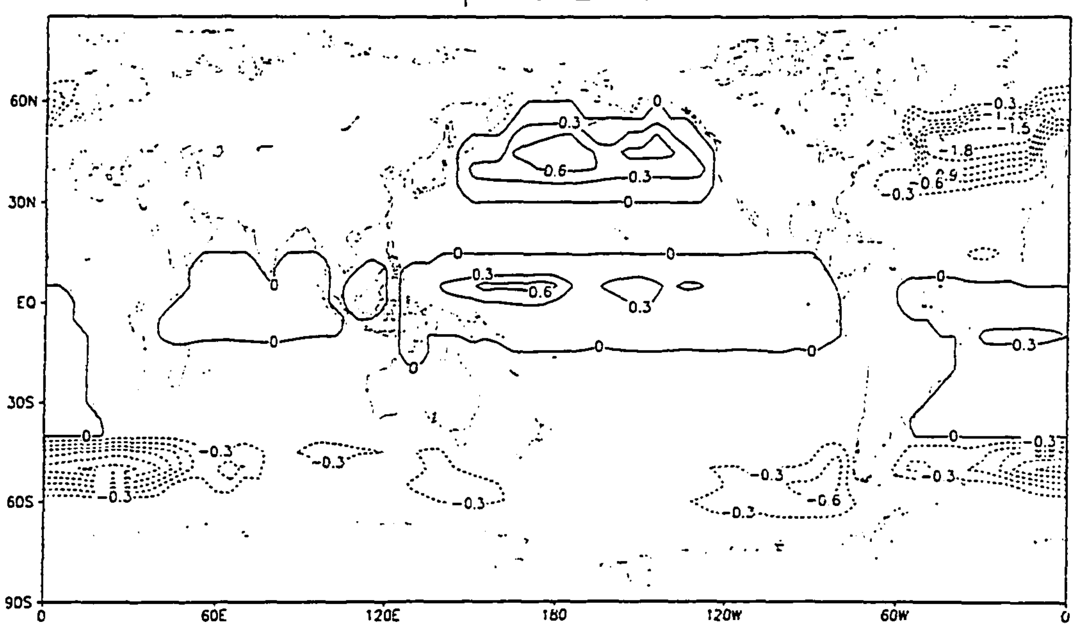
Figure 6.5 Ocean Surface Flux(Mar. - Apr.)

March CO2 Flux



GrADS: COLA/IGES

April CO2 Flux



GrADS: COLA/IGES

Figure 6.6 Ocean Surface Flux(May. - Jun.)

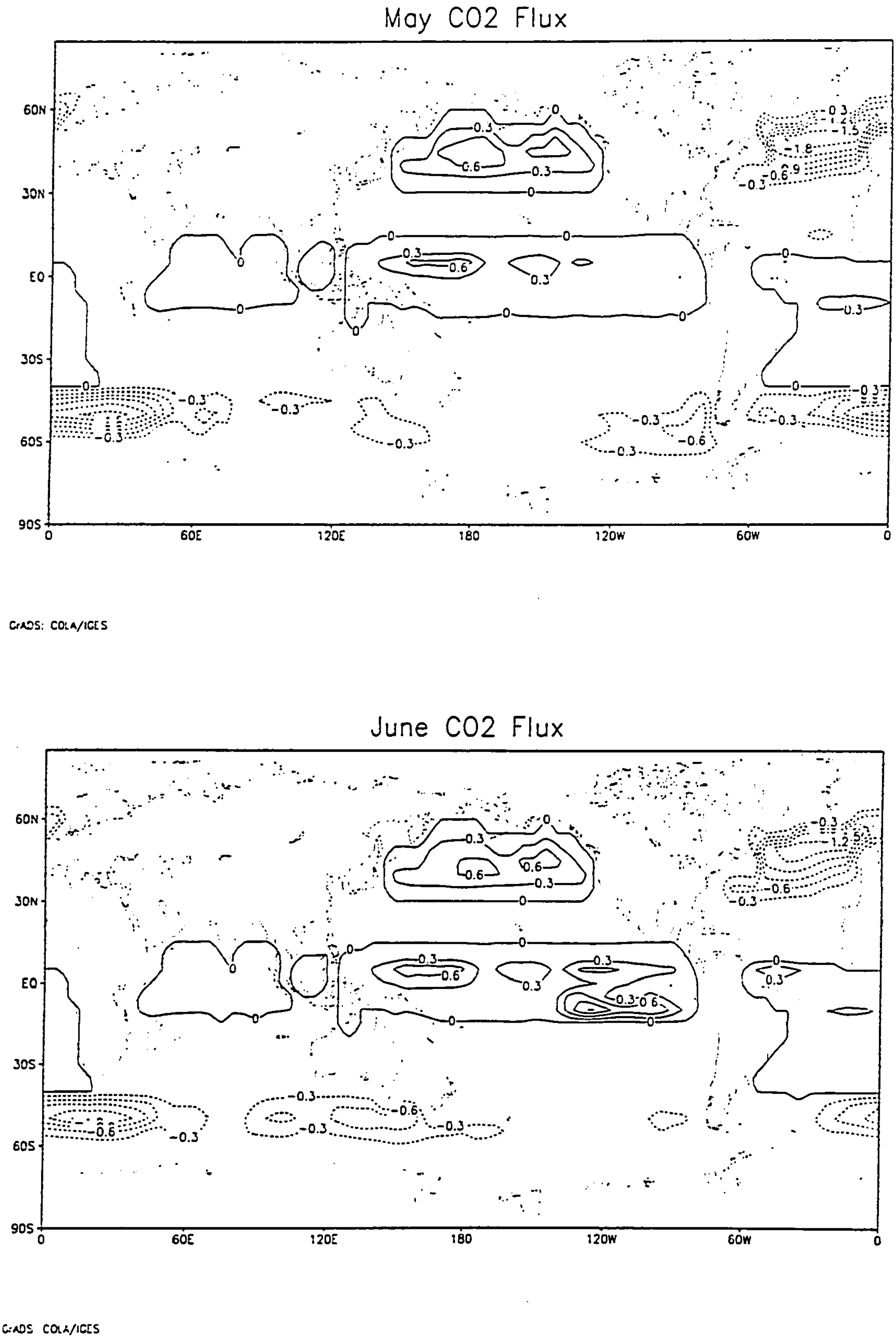
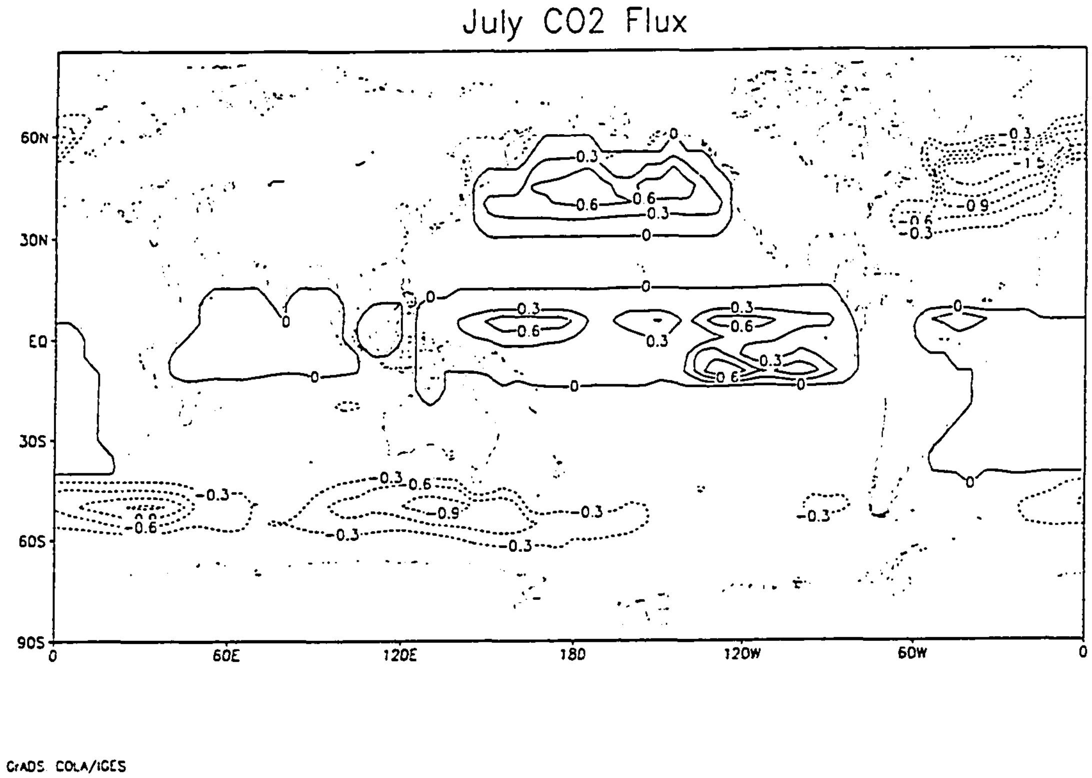


Figure 6.7 Ocean Surface Flux(Jul. - Aug.)



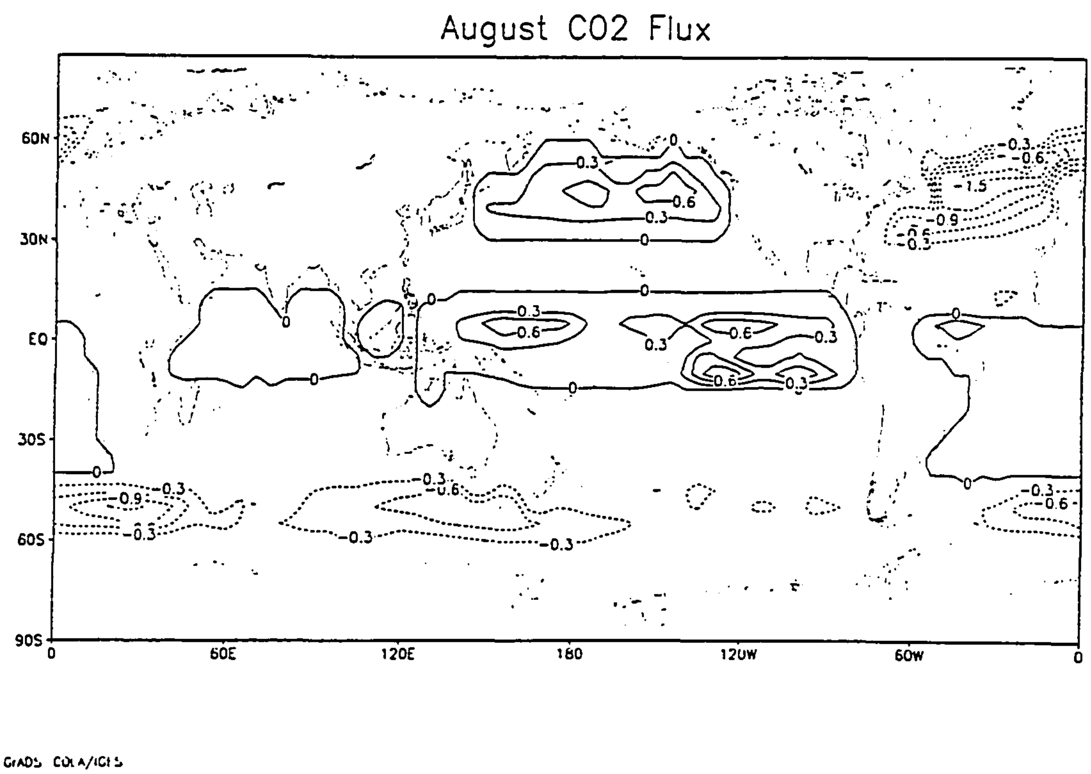
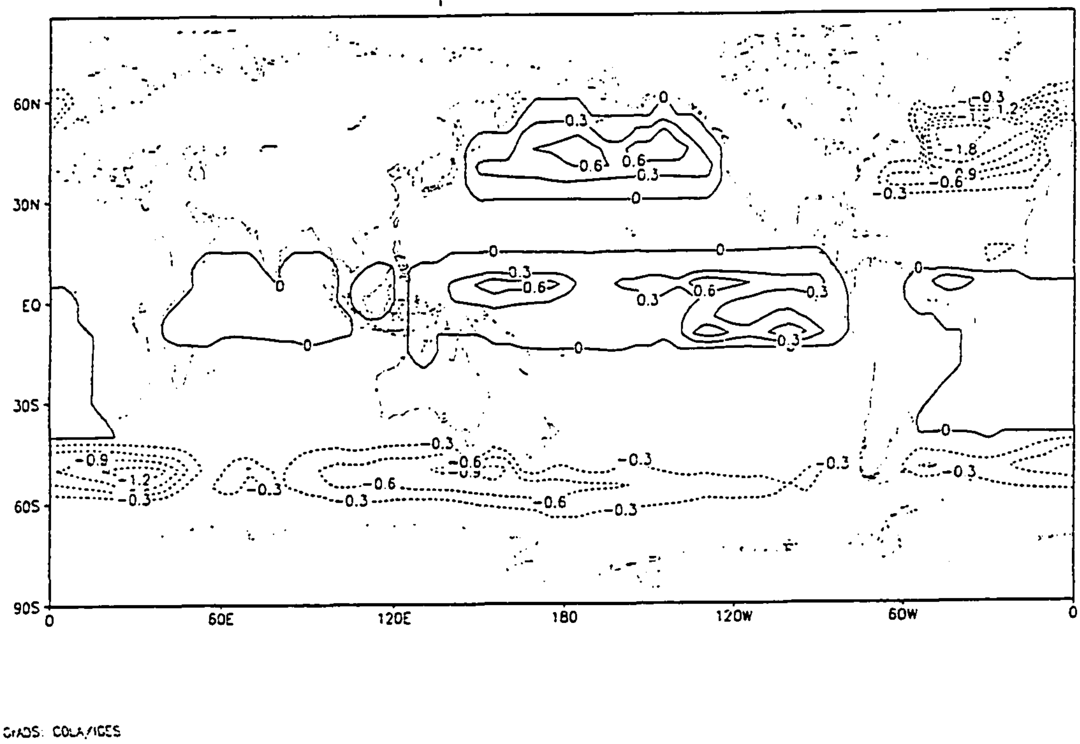


Figure 6.8 Ocean Surface Flux(Sep. - Oct.)

September CO2 Flux



October CO2 Flux

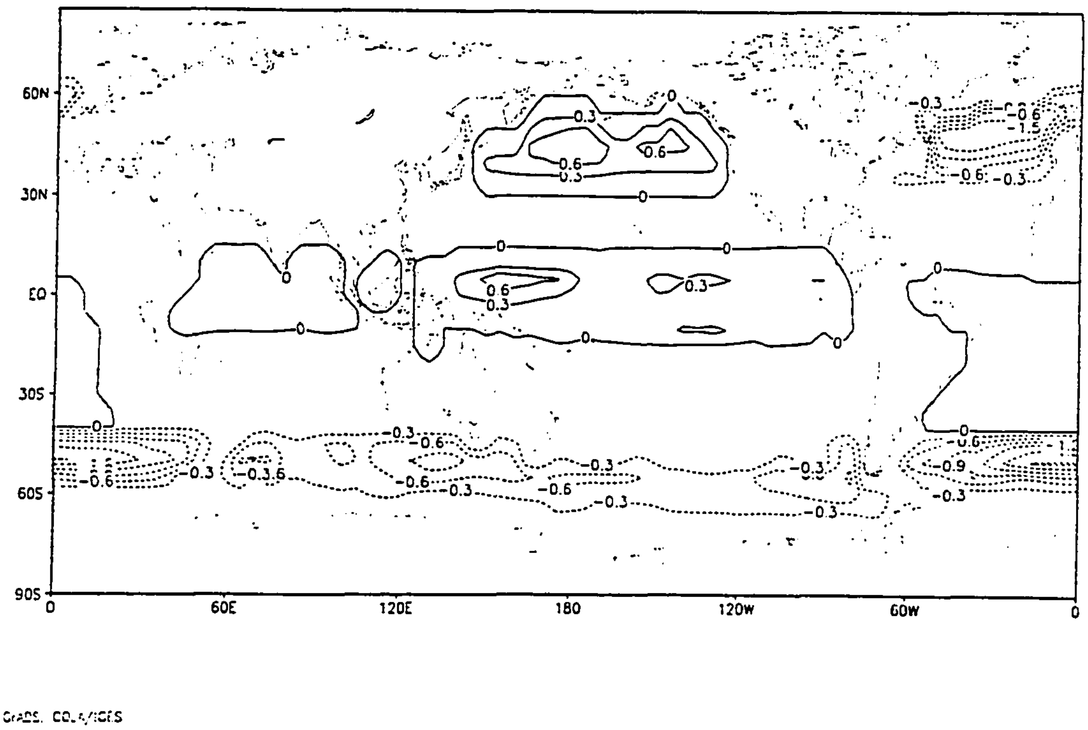
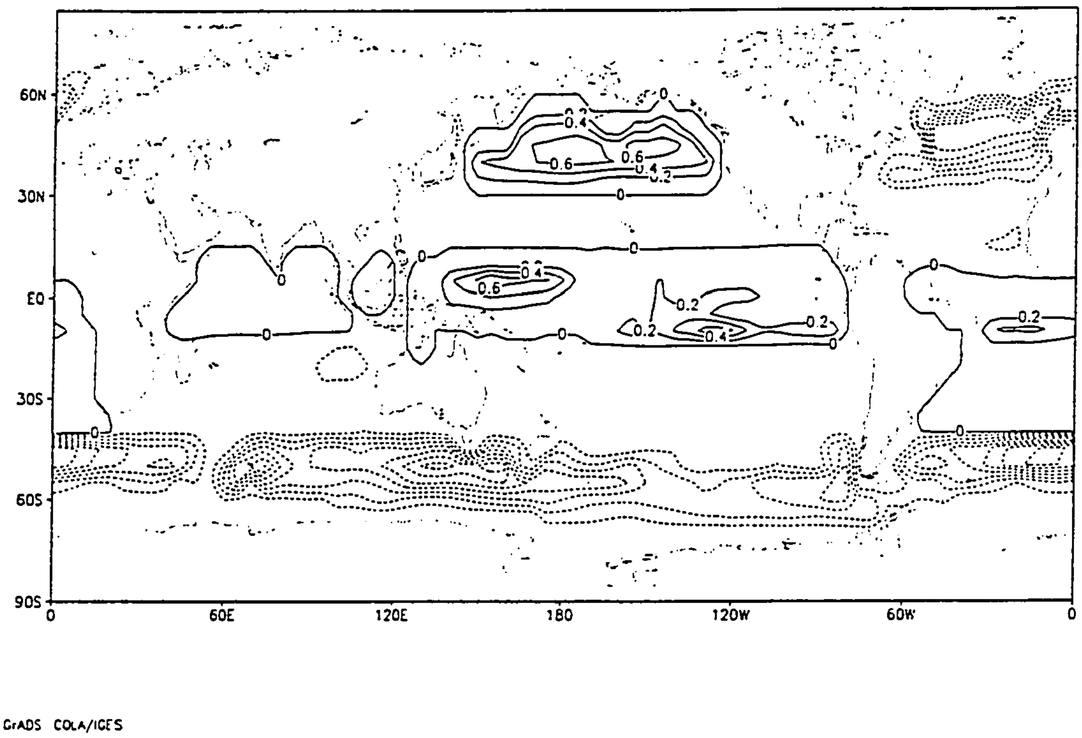


Figure 6.9 Ocean Surface Flux(Nov. - Dec.)

November CO2 Flux



December CO2 Flux

CHAPTER 7: The Fossil Fuel Combustion Module

The net effect of fossil fuel combustion has been to add to the global carbon cycle between 240 and 260 Gt of carbon since 1830, while current emissions resulting from the burning of coal, oil, and natural gas contribute between five and six Gt C per year to the global carbon cycle (Perry[51]). The measurements were taken from air bubbles as old as 160.000 years trapped in ice cores. The ice core was taken from Vostok, Antarctica, and is a total of 2048 meters in length. In order to analyze the atmospheric CO_2 concentration for a particular time, a slice of the core corresponding to the time in question is placed in an evacuated chamber, crushed, and the chemical composition of the air bubbles analyzed by gas chromatography.

The data shown seem to be consistent with other data as far back as 10,000 years. This data shows clearly that the atmospheric CO_2 concentration has risen exponentially over the past hundred years. The increase in atmospheric CO_2 is very closely correlated with the consumption of fossil fuels until 1985. Estimates of future CO_2 release for the period 1995-2100 due to fossil fuel combustion range from 700 Gt C to 2100 Gt C (Bowden[52] et al.). These estimates are based on data regarding fuels consumption rates.

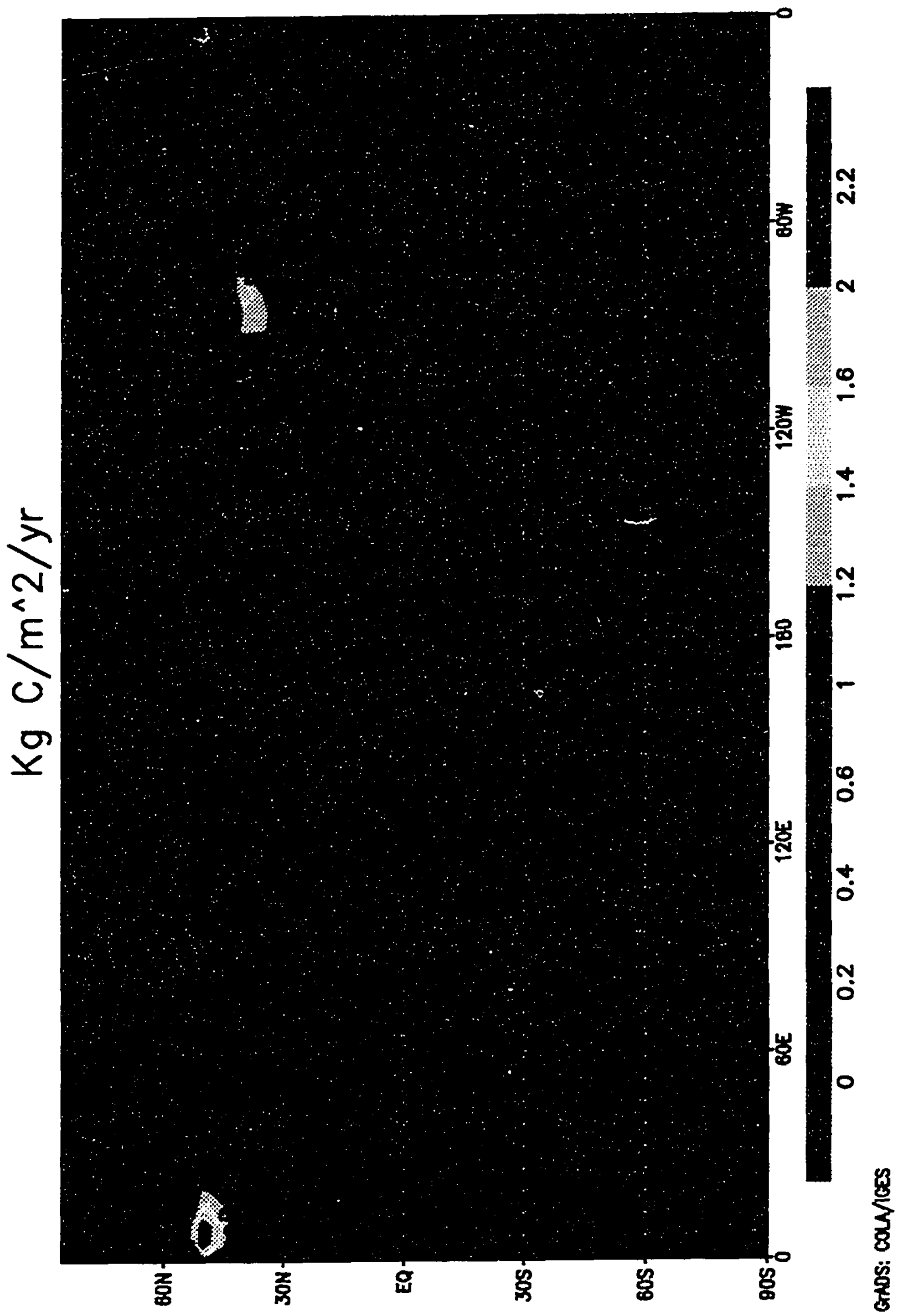
For the purposes of this model, the CO_2 emission data was given in the form of per capita consumption of fossil fuel (Fig. 7.1). Fossil fuel CO_2 produced is expressed on a one degree by one degree latitude by longitude grid. This data was modified according to the scenario for fossil fuel consumption investigated. Each of the data points was scaled according to the predicted increase in fossil fuel consumption. In order to extrapolate the original data set to the one degree by one degree grid, individual country data from the United Nations energy statistics were used to calculate the net consumption of fossil fuel. Emission rates were calculated for individual countries by the following formula:

$$C = \Sigma_i (FC)_i (FO)_i C_i$$

where FC is the net fuel consumption, FO is that fraction of fuel that is oxidized during combustion, and C is the carbon content of the fuel.

The incorporation of the fossil fuel combustion data into the model is described in chapter 9. Except for the modeled increase in fossil fuel consumption, there is no time dependence included in the data set since it has been determined that the seasonal variation in fossil fuel consumption, while present, is less than two percent of the average annual consumption (Taylor[53]).

Figure 7.1 Fossil Fuel Consumption


Kg C/m^2/yr
60N
30N
EQ
30S
60S
90S
0
60E
120E
180
120W
60W
0
0
0.2
0.4
0.6
1
1.2
1.4
1.6
2
2.2
GrADS: COLA/IGES

Chapter 8 The Biomass Burning Module

Global biomass burning is a significant source of radiatively active gases to the atmosphere, the most relevant to global climate change being CO_2 (Lashof[54]). The primary sources of biomass burning are the burning of forests for land clearing and the annual burning of grasslands. Methods exist for inferring biomass burning data from data gathered during satellite observations (Crutzen and Andrea[55]). These data can then be converted into the CO_2 released during a particular biomass burning event. CO_2 is also released during deforestation associated with biomass burning in certain geographic regions (Houghton[56] et al.).

The data currently available on biomass burning is sparse. Values obtained are at best monthly averages over large geographic areas (Kaufmann[57] et al.). On the other hand, there exists a limited amount of high resolution data gathered from satellite images. This data is very well localized in both time and geographical extent; however, it is representative of an extremely short time span, eg. a few days. Nevertheless, seasonality of biomass burning can be inferred from data taken over the same location at different times. Such analyses have be performed on data gathered by the Defense Meteorological Satellite Program (DMSP) in order to infer the seasonality of African savanna fires (Cahoon[58] et al.).

An example of coarse-scale data is the distribution of tropical biomass burning. This burning has been estimated and the resultant CO_2 emissions given on a five degree by five degree latitude by longitude grid (Hao and Liu[59]). This data set is summarized in table 7.1. The areal extent of biomass burning deduced from satellite observations is combined with the ecosystem type to obtain an estimate of CO_2 released during biomass burning. Total biomass burned is given by:

$$M = AB\alpha\beta$$

where A is the total area burned, B is the amount of biomass in the particular ecosystem, α is that fraction of biomass that is above ground, and β is the burning efficiency, or the fraction of biomass that is converted to CO_2 and other gases.

M is converted to gross CO_2 released, C, by the following relation:

$$C = 0.45M$$

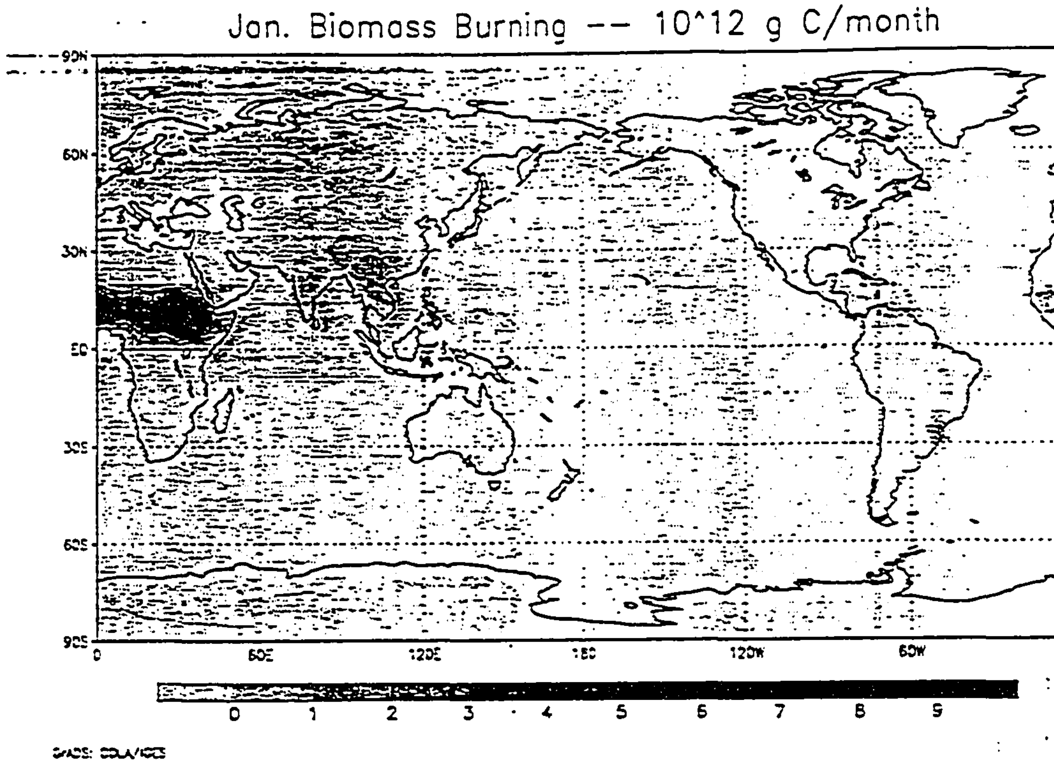
Some CO_2 released during biomass burning is reincorporated back into the terrestrial biosphere over a long enough time scale, typically months to years (Houghton[56]). This would seem to imply that global biomass burning has no net effect upon the global carbon cycle. However, there are two concerns regarding the CO_2 released during biomass burning. First, the carbon released immediately released during biomass burning is carbon that has accumulated for months to decades and is not immediately replaced by new growth. This

CO_2 remains in the atmosphere until removed by some other sink. Secondly, the distinction must be made between CO_2 released during burning of savannas and the CO_2 released from deforestation processes associated with biomass burning, such as the equivalent removal of terrestrial biosphere sinks. The estimates of CO_2 released by deforestation are summarized in table 8.2.

The data representing CO_2 release from deforestation comes directly from the biomass burning data. No attempt has been made to model the actual physical processes that control the exchange of CO_2 due to deforestation. Deforestation is therefore represented in the module by the following procedure: (1) determine the location and areal extent of the deforestation. This is usually determined from known trends but is also obtainable from satellite data. (2) locate the grid box in the model where the deforestation has taken place and the corresponding ecosystem from the ecosystem database. (3) determine a CO_2 exchange weighting coefficient defined as the ratio of the areal extent of deforestation estimated in step one above to the area of the grid box where the deforestation has occurred. (4) multiply the CO_2 exchanges calculated by the terrestrial biosphere module for the particular grid cell by the weighting function. That is, the the terrestrial biosphere module takes the data from the deforestation module and applies it to grid-cell scale CO_2 exchange function.

In the model, global biomass burning is represented as monthly average fluxes specified on a 5 degree by 5 degree latitude by longitude grid. The biomass burning data is combined with the deforestation data set previously mentioned to form a net CO_2 emissions profile over the globe. The data for global biomass burning used as model input is specified on a 5 degree by 5 degree grid extending from 35 degrees north to 60 degrees south and 110 degrees west to 170 degrees east. The data set describes biomass burning in tropical America, tropical Asia, and tropical Africa. The type of burning is classified as either forest or grassland, and the CO_2 flux is given in terms of 10^{12}g CO_2 per month. Finally, the months of intensive burning are specified. Monthly input is shown in figures 8.1-8.6. The incorporation of this data into the model is described in chapter 9.

Figure 8.1 Tropical Biomass Burning(Jan. - Feb.)



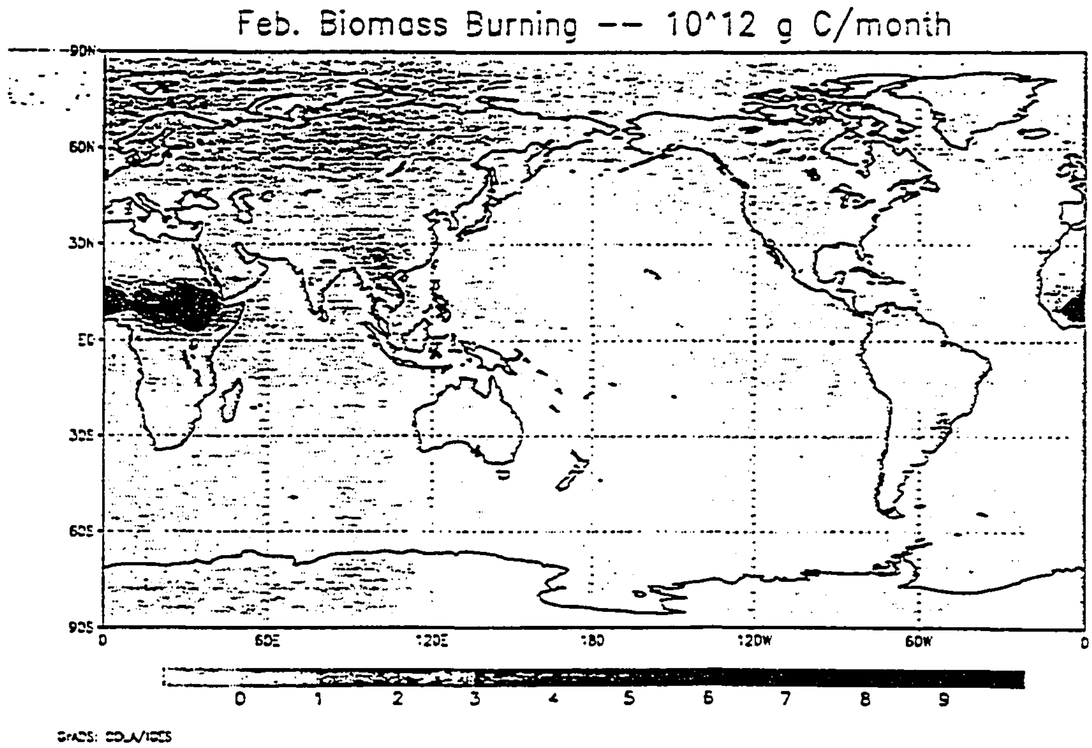
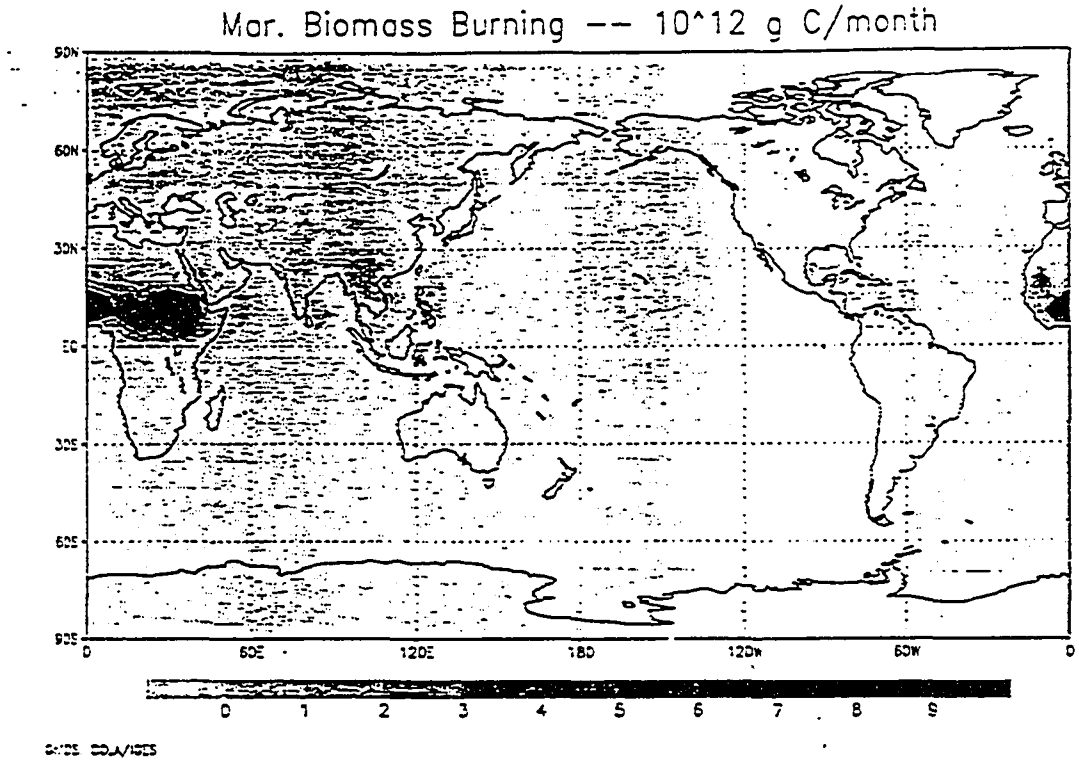


Figure 8.2 Tropical Biomass Burning(Mar. - Apr.)



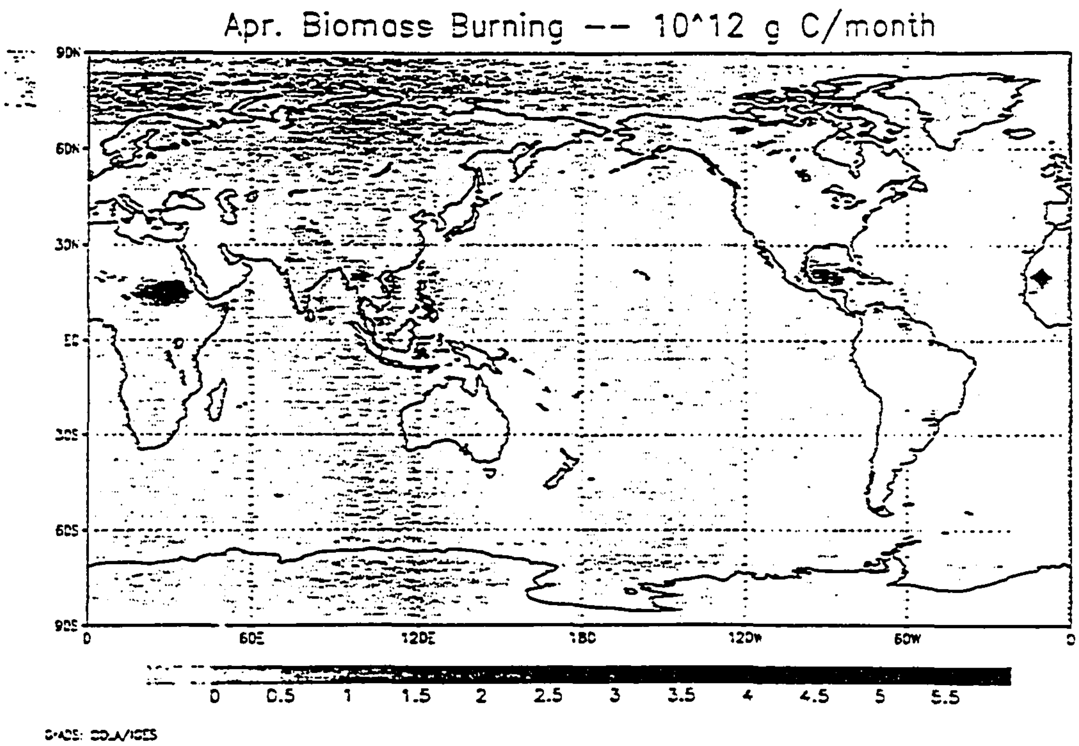
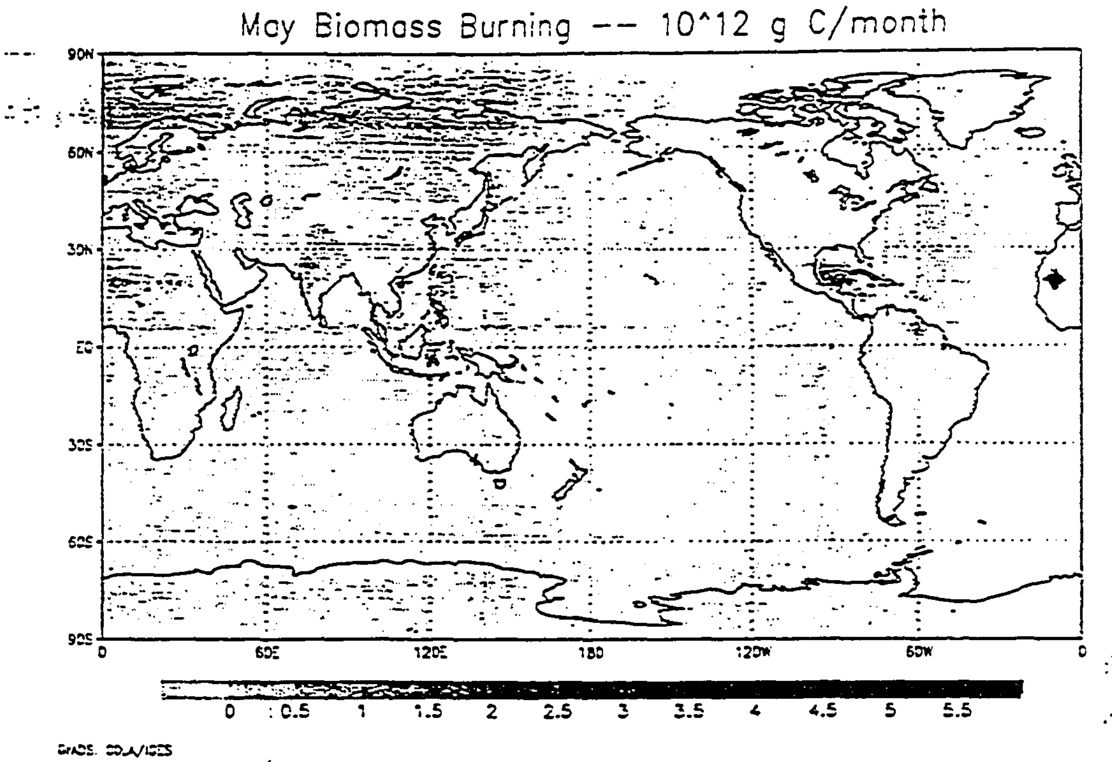


Figure 8.3 Tropical Biomass Burning(May - Jun.)



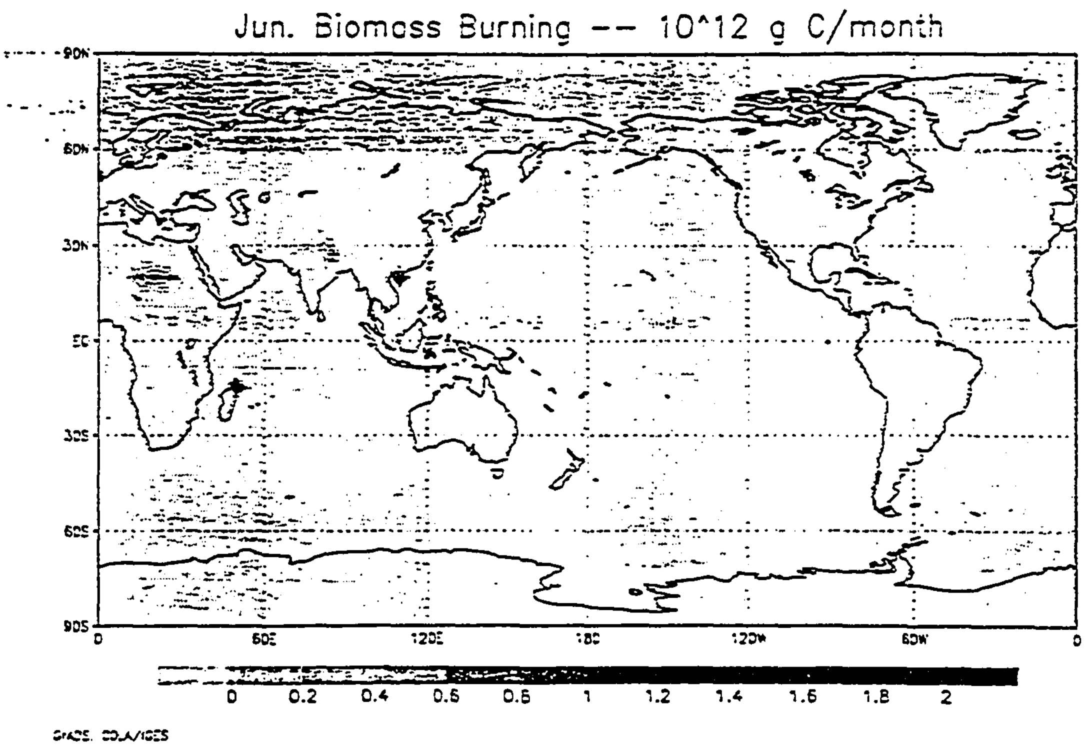
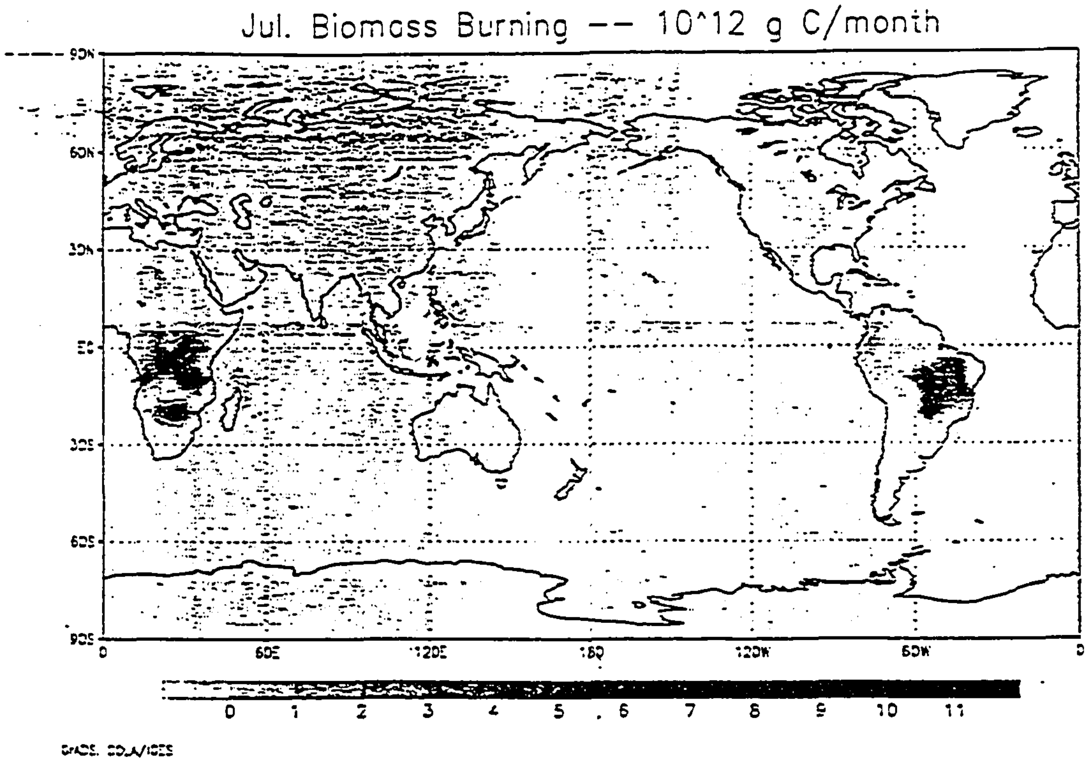


Figure 8.4 Tropical Biomass Burning(Jul. - Aug.)



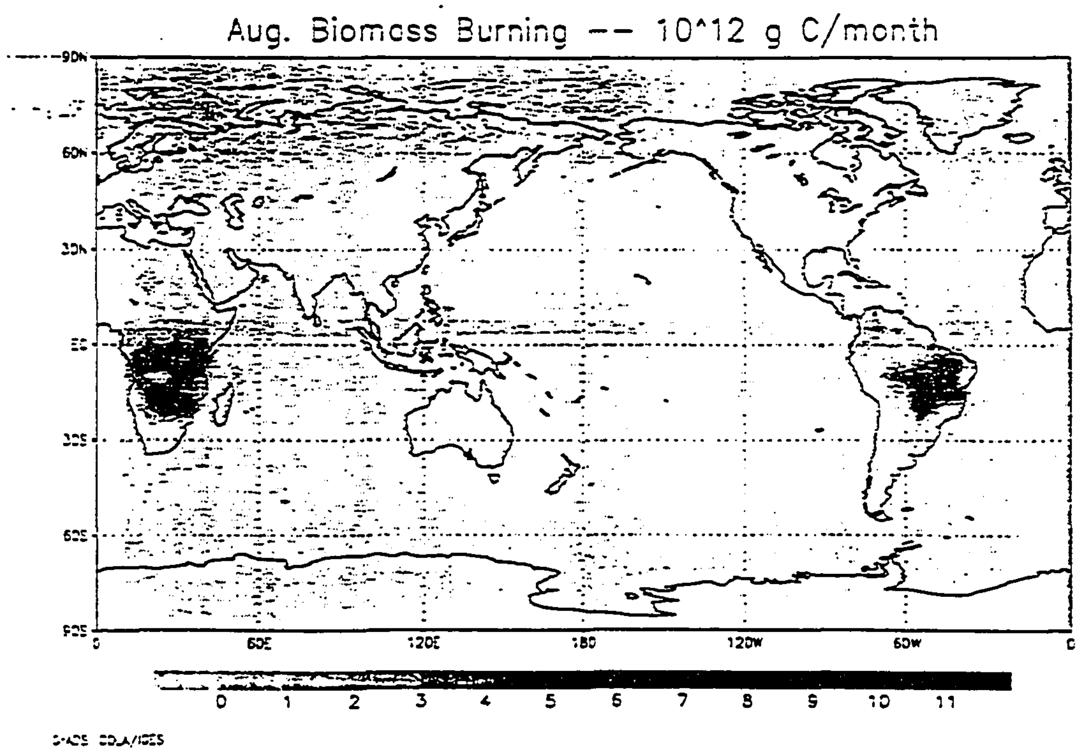
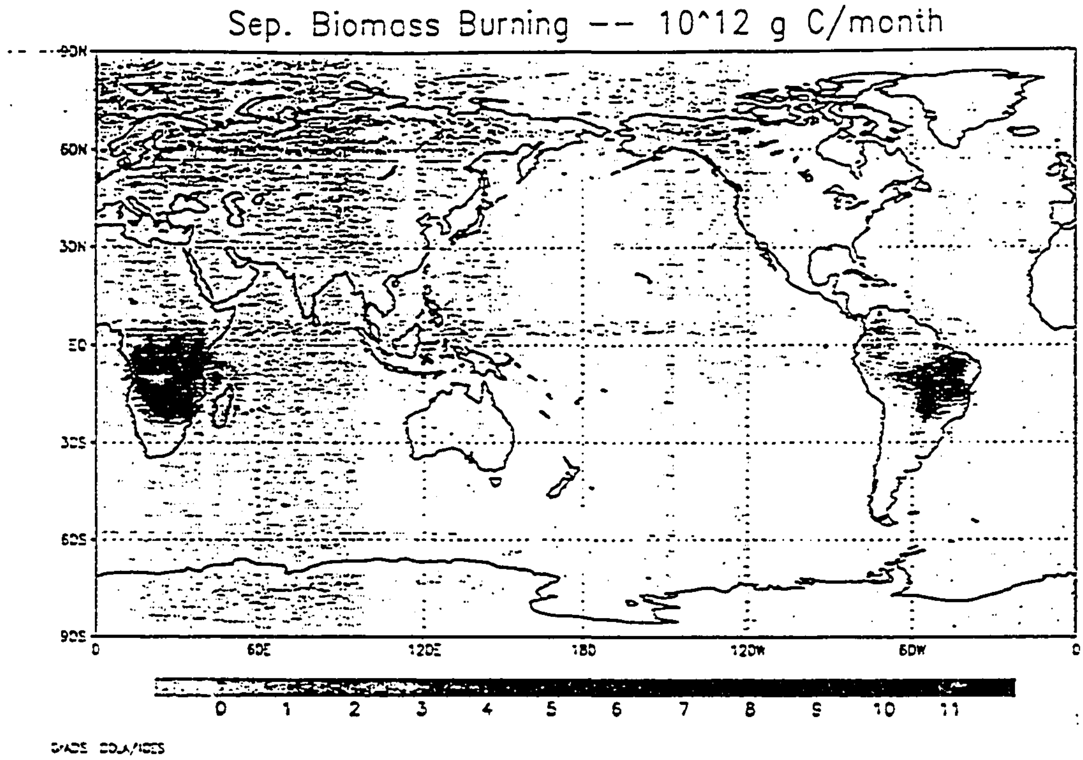


Figure 8.5 Tropical Biomass Burning(Sep. - Oct.)



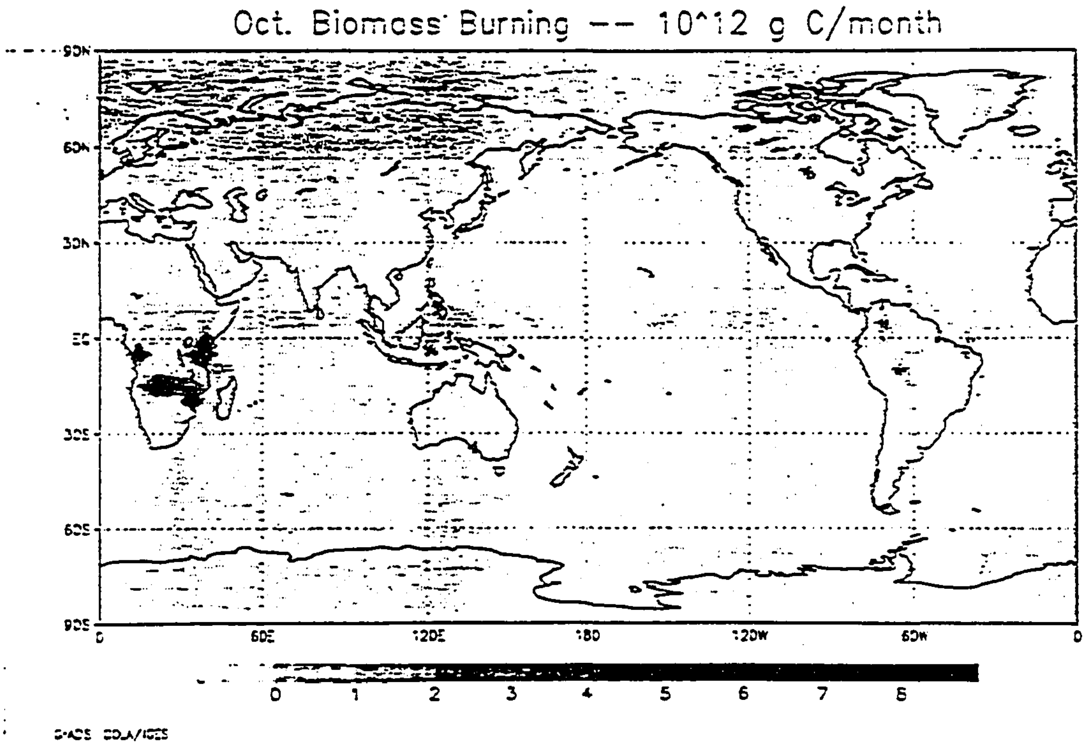
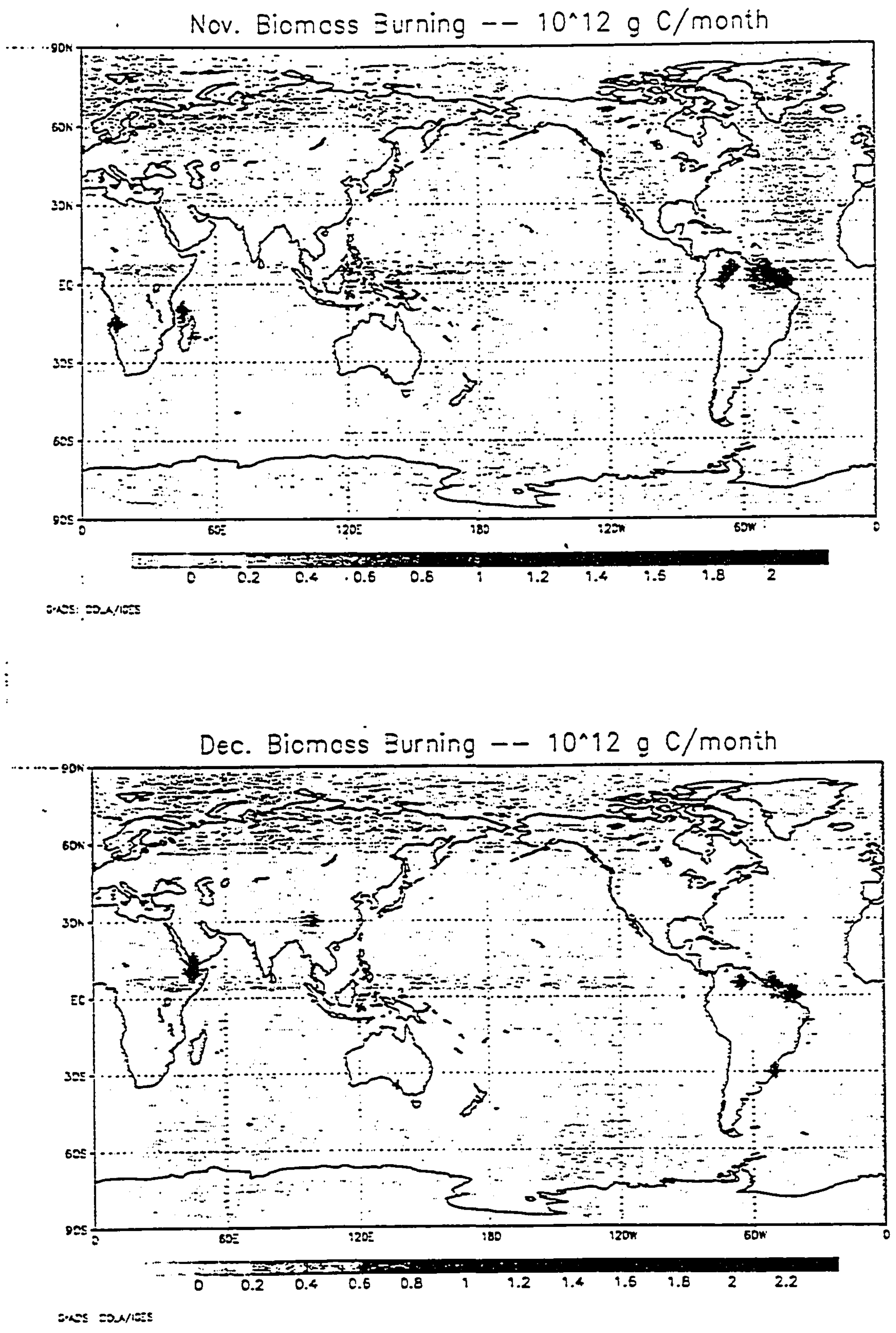


Figure 8.6 Tropical Biomass Burning(Nov. - Dec.)



CHAPTER 9: Module Coupling and Limitations

The individual modules representing the atmosphere, ocean, and terrestrial biosphere, as well as biomass burning, deforestation, and fossil fuel combustion, are fully coupled with respect to CO_2. The modules representing the ocean and biosphere are sensitive to the CO_2 content of the atmosphere, thus they exhibit different patterns depending on the atmospheric CO_2 mixing ratio.

Care was taken to ensure that each module functioned properly when isolated from the rest of the model. This was an important step towards validation of the complete model. When possible, results from the present implementations of the modules were compared with past results from the literature. In the numerical computer model, the individual modules pass information through files on disk. The files describe either CO_2 concentrations, in the case of data passed to and from the advection module, or data base modifiers. The data base modifiers are generated by one module process and act on a data base that controls CO_2 fluxes within a separate module as in the case of deforestation or biomass burning modifying the data set of ecosystems used by the terrestrial biosphere module. The different modules comprising the model have different time scales associated with their own internal processes. For example, the time scale associated with the terrestrial biosphere module is taken to be one day, while the timestep for the ocean carbon cycle is six hours, and the advection timestep for the atmosphere is six hours.

Several model processes are unaffected by global carbon cycle processes, at least to first order. Examples of such processes are ocean and atmospheric circulation. Still other variables are affected, such as atmospheric temperature, but the time for the effect to become noticeable is substantially longer than the model simulation time.

These observations can be used to drastically reduce the amount of computer time necessary to evaluate a model scenario without substantially altering the model predictions. To this end, the modules representing atmospheric and oceanic general circulation are run beforehand, and the results are stored on disk for subsequent model runs.

A flow chart representation of the numerical model at the level of the individual modules is shown in figure 9.1. A list of individual modules and the data sets that are used by them is given in table 9.1.

The distribution of atmospheric moisture affects cloudiness and rainfall on regional and global scales (Whitford[59]). Together with temperature, these specify almost all of the exogenous driving variables for the ecosystem models (windspeed is neglected). If these variables change significantly, the global terrestrial biosphere will behave differently (King[36] et al.).

If all these processes are considered from the perspective of the rate of error introduced by ignoring certain processes and the time scales for certain feedback loops to have an effect, the model time horizon can be estimated to be 15 years. The time horizon is defined to be the amount of model time before the uncertainty introduced in state variables becomes as large as the variables themselves.

Figure 9.1 Module Coupling

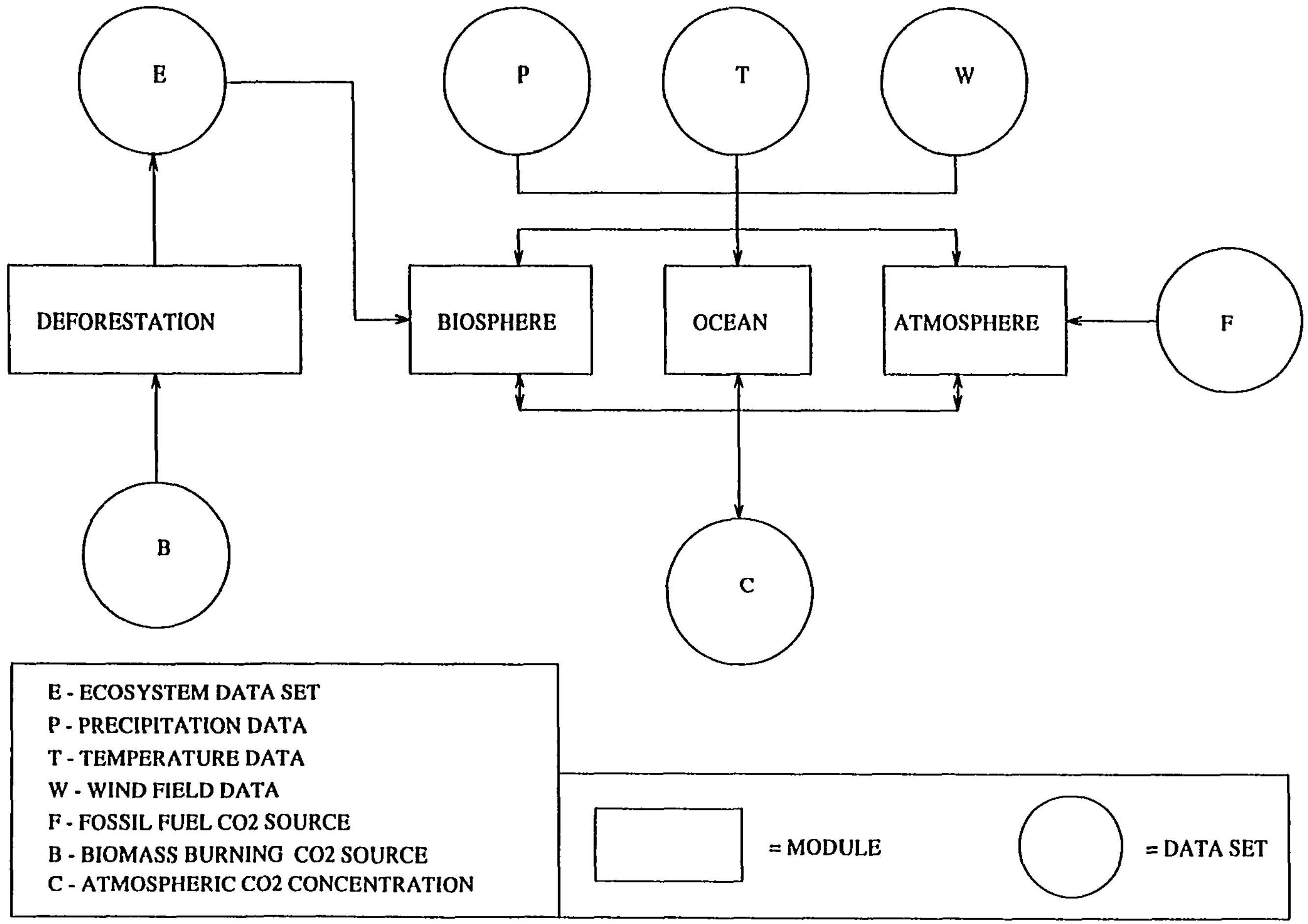


Table 9.1 Modules / Data Sets

DATA SETS

MODELS		PRECIP	TEMP	WIND	ATMCO2	ECOSYS	FFC	BMB
	BIOSPHERE	X	X	X	X	X		
	OCEAN CIRC.	X	X	X				
	ATMOS. CIRC.			X	X			
	DEFORESTATION					X		X
	OCEAN CARBON		X	X	X			

CHAPTER 10: Results of Model Runs

The Carbon Dioxide Information Analysis Center (CDIAC) publishes data sets gathered from the various CO_2 monitoring sites around the world. This data is in the form of monthly average atmospheric CO_2 concentrations. The monitoring sites are typically located well away from land in order to obtain CO_2 concentrations from relatively uncontaminated air. The primary features in this data are the seasonality and latitudinal variation of the atmospheric CO_2 concentration.

Data for five of the thirty-six sites are presented along with model data for the years 1985 - 1990 corresponding to the locations of these sites (Fig. 10.1 - 10.5). Then, the model is used to investigate the following four scenarios: 1. In the first run, Business-as-Usual (BaU) for the period 1990 - 2000. Biomass burning, fossil fuel combustion, and deforestation are allowed to increase at their present rates. 2. In the second run, biomass burning is halted, however, everything else is kept identical to the first run. 3. In the third run, fossil fuel consumption is modified according to the following projections: a. constant fossil fuel combustion; and b. reduction of fossil fuel combustion. 4. In the final run, the BaU scenario is adopted, but the atmospheric fraction of CO_2 is doubled. The earth's surface temperature is increased by 1K to account for the additional infrared warming. These results are presented as whole-atmosphere averages in figures 10.6 through 10.9. Finally, the net contributions of biomass burning and fossil fuel combustion to the atmospheric levels of CO_2 are presented in figures 10.10 and 10.11. These effects are shown as snapshots of the global CO_2 distributions at the end of the ten year model runs above.

Figures 10.12 and 10.13 represent the average monthly flux of CO_2 into and out of each model grid cell for the months of September and March. These months were chosen since they represent the maximum and minimum of biomass burning. Fluxes are given for fossil fuel combustion, biomass burning, ocean-atmosphere exchange, and biosphere-atmosphere exchange and are labeled FFC, BMB, OCN, and TBS, respectively. The total exchange is also given for each grid cell, expressed as NET=FFC+BMB+OCN+TBS. Fluxes are given in kg CO_2 / grid box scaled by $2x10^{-6}$ for each month, and the sign convention is such that a positive number represents a flux of CO_2 into the atmosphere, while a negative number represents a flux of CO_2 into either the ocean or the biosphere at that location.

Figure 10.1 Data v. Model(70N x 155W)

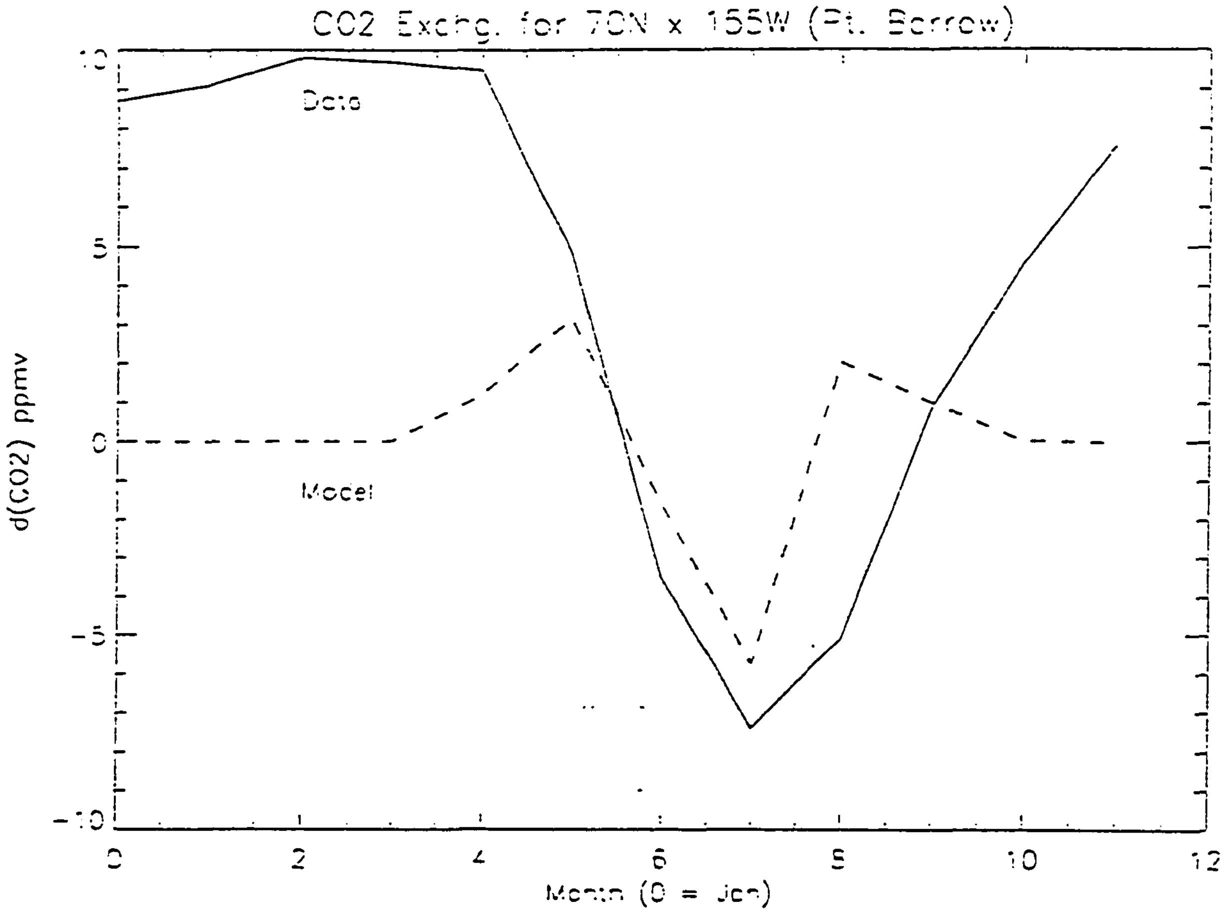


Figure 10.2 Data v. Model(20N x 155W)

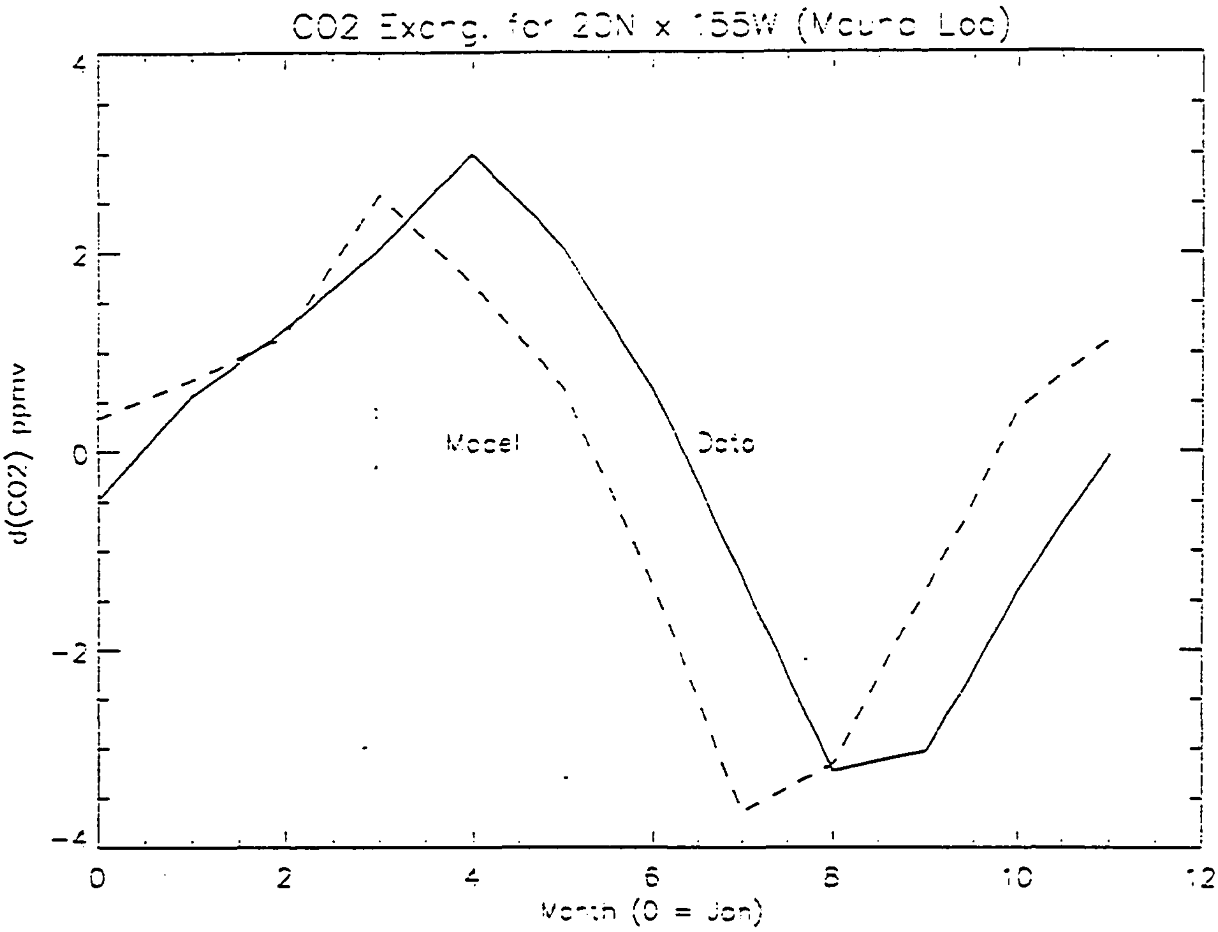


Figure 10.3 Data v. Model(15N x 145E)

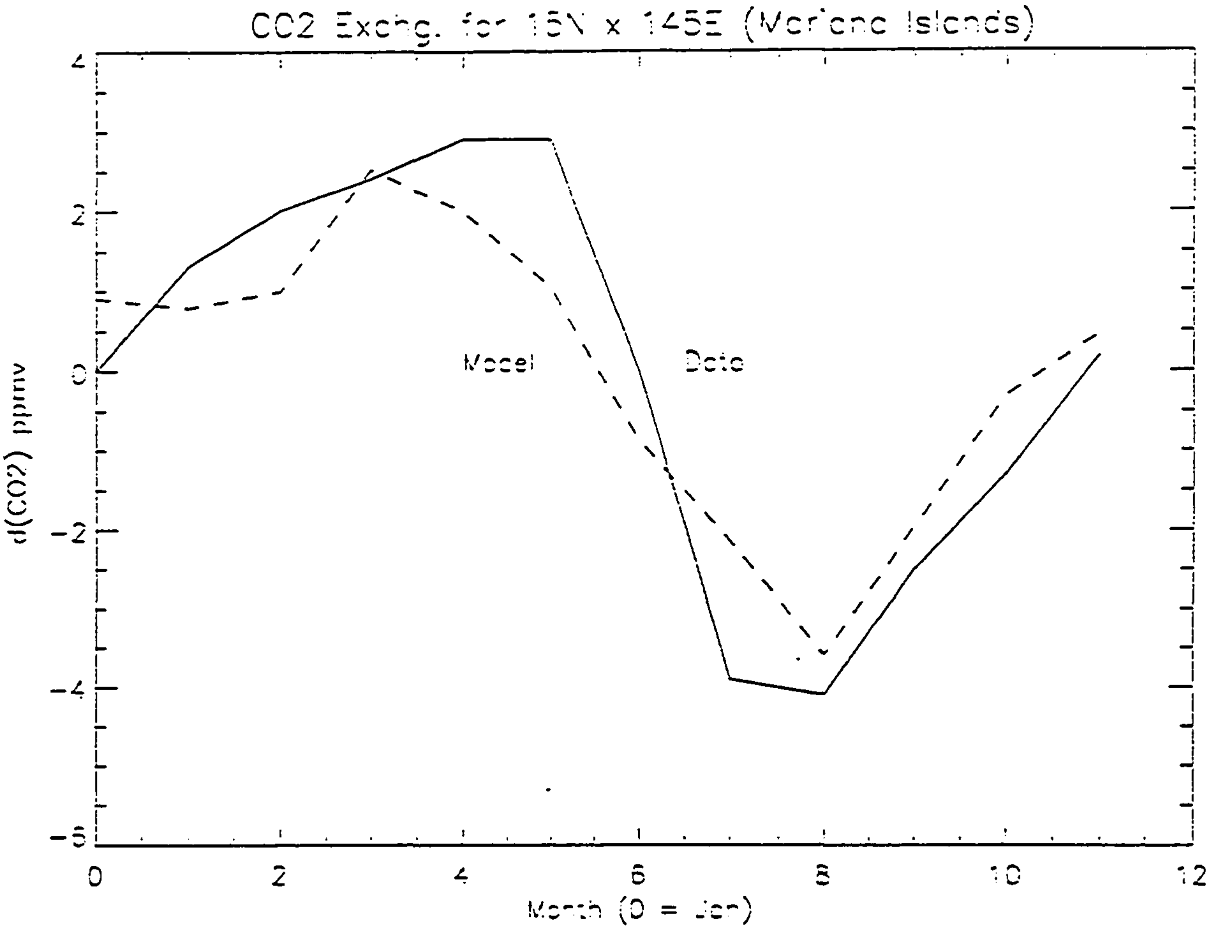


Figure 10.4 Data v. Model(10S x 15W)

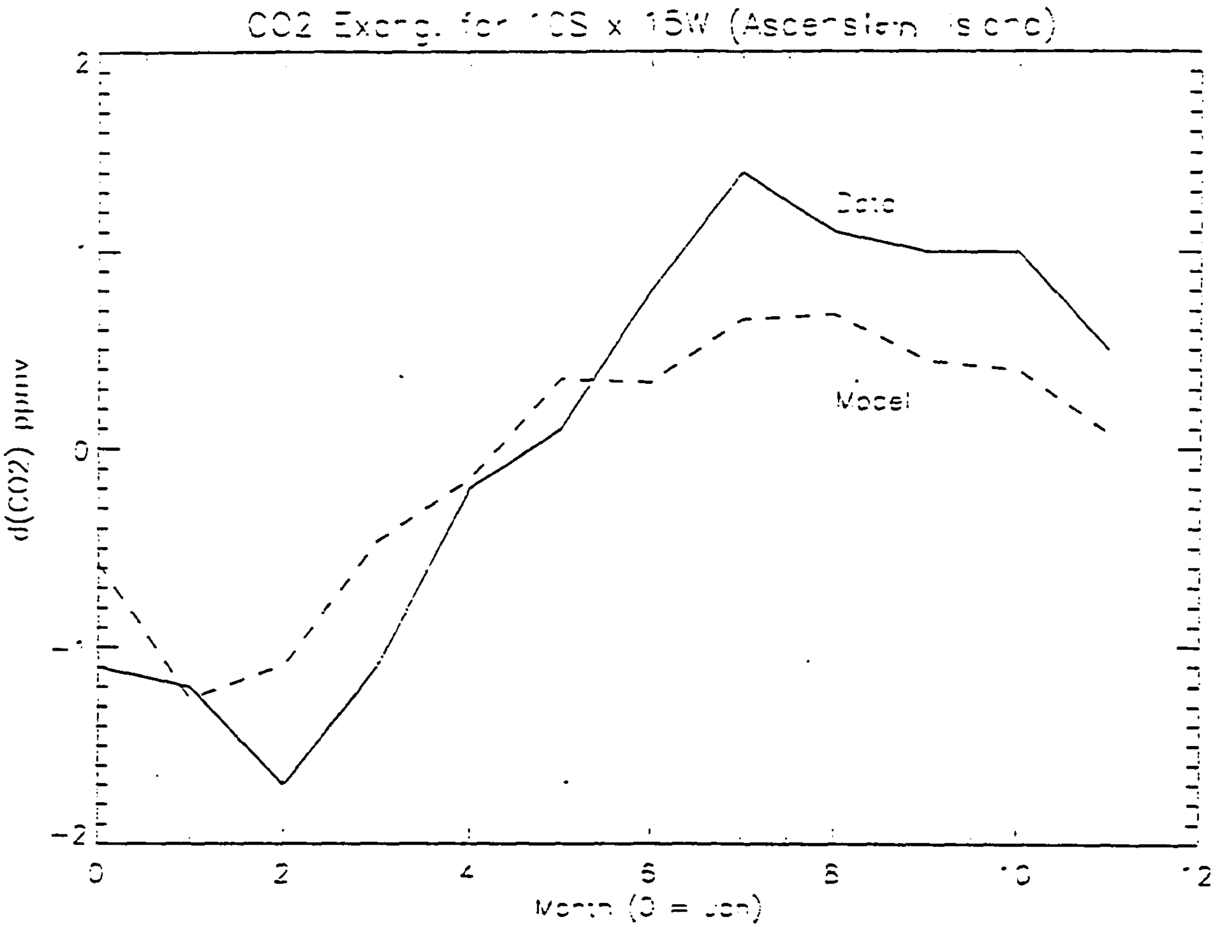


Figure 10.5 Data v. Model(65S x 65W)

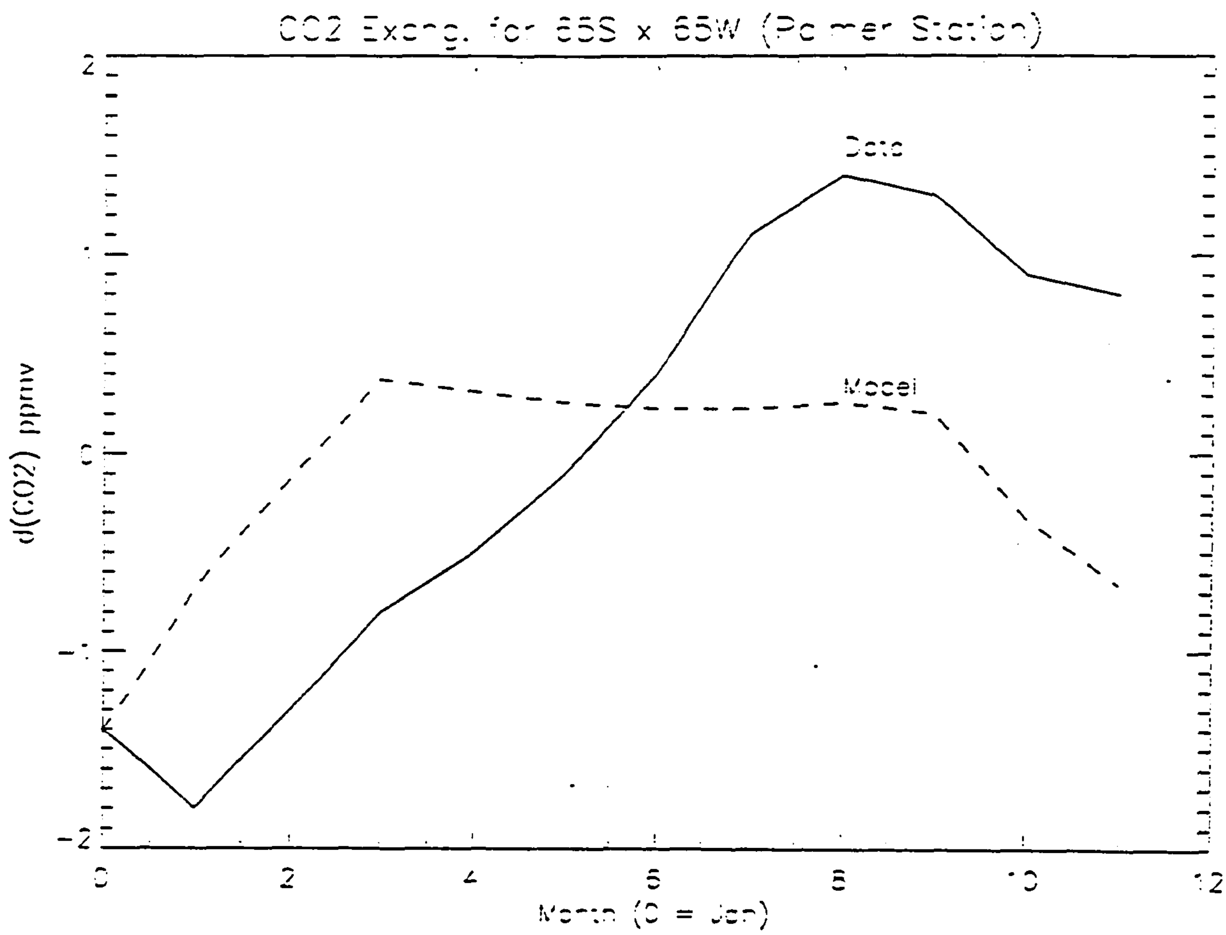


Figure 10.6 Business as Usual

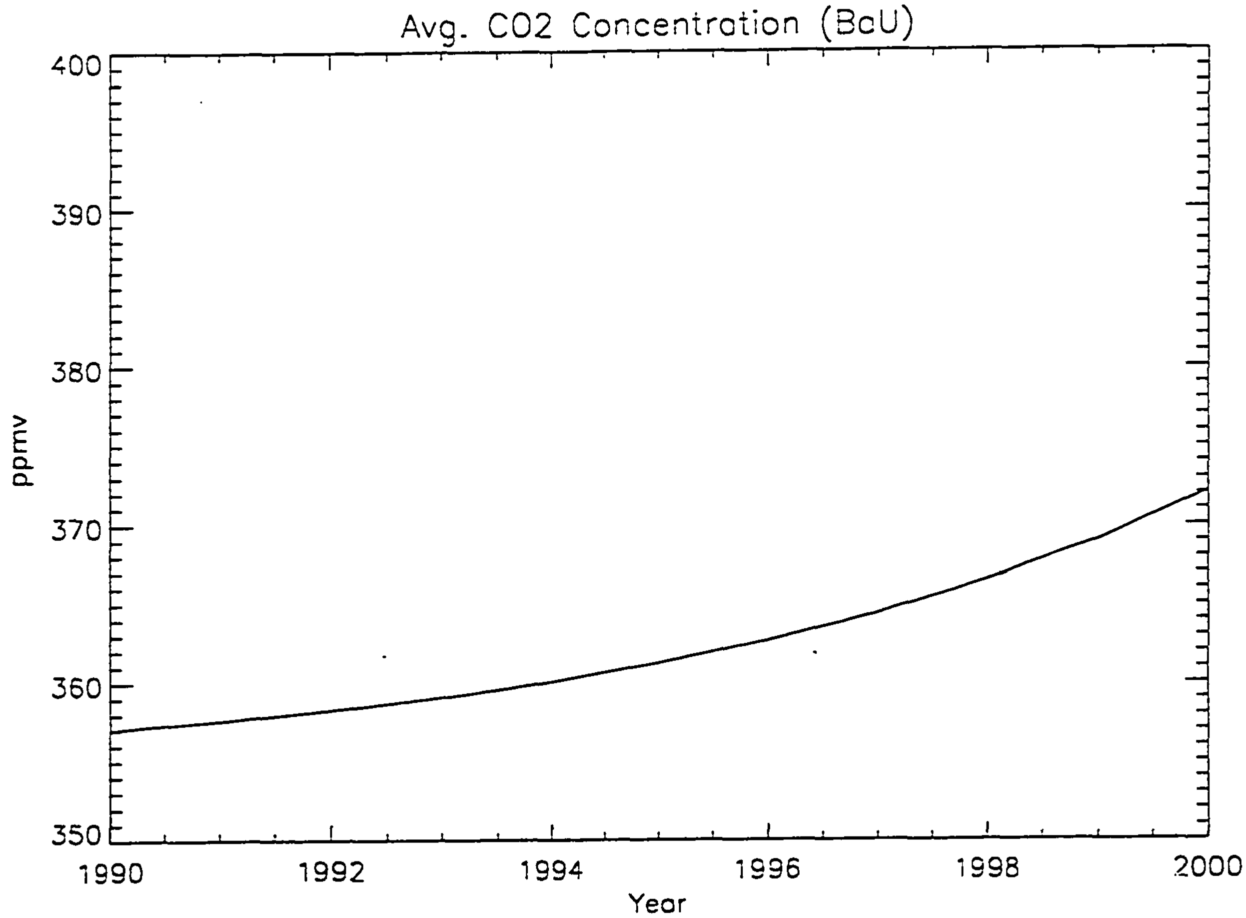


Figure 10.7 Halt Biomass Burning

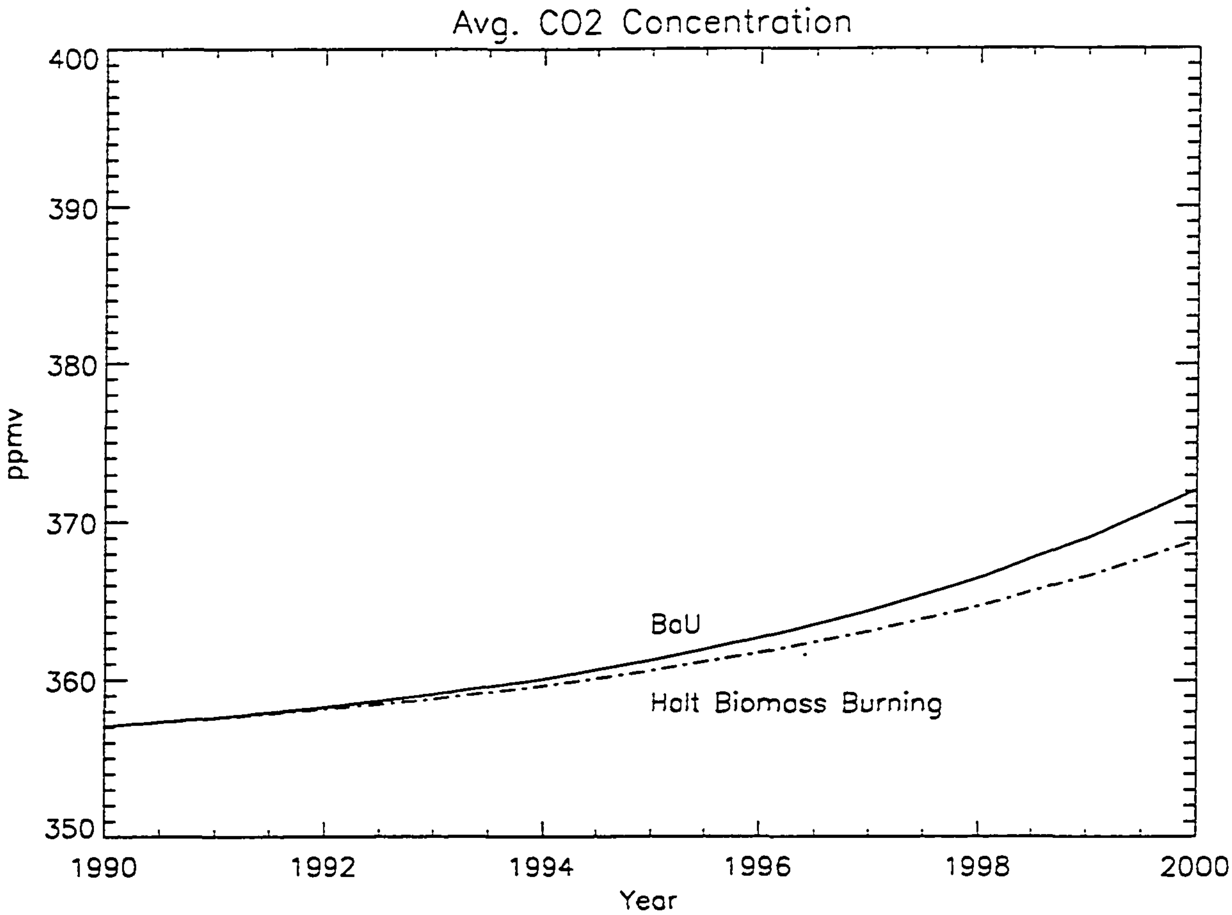


Figure 10.8 Reduce Fossil Fuel Consumption

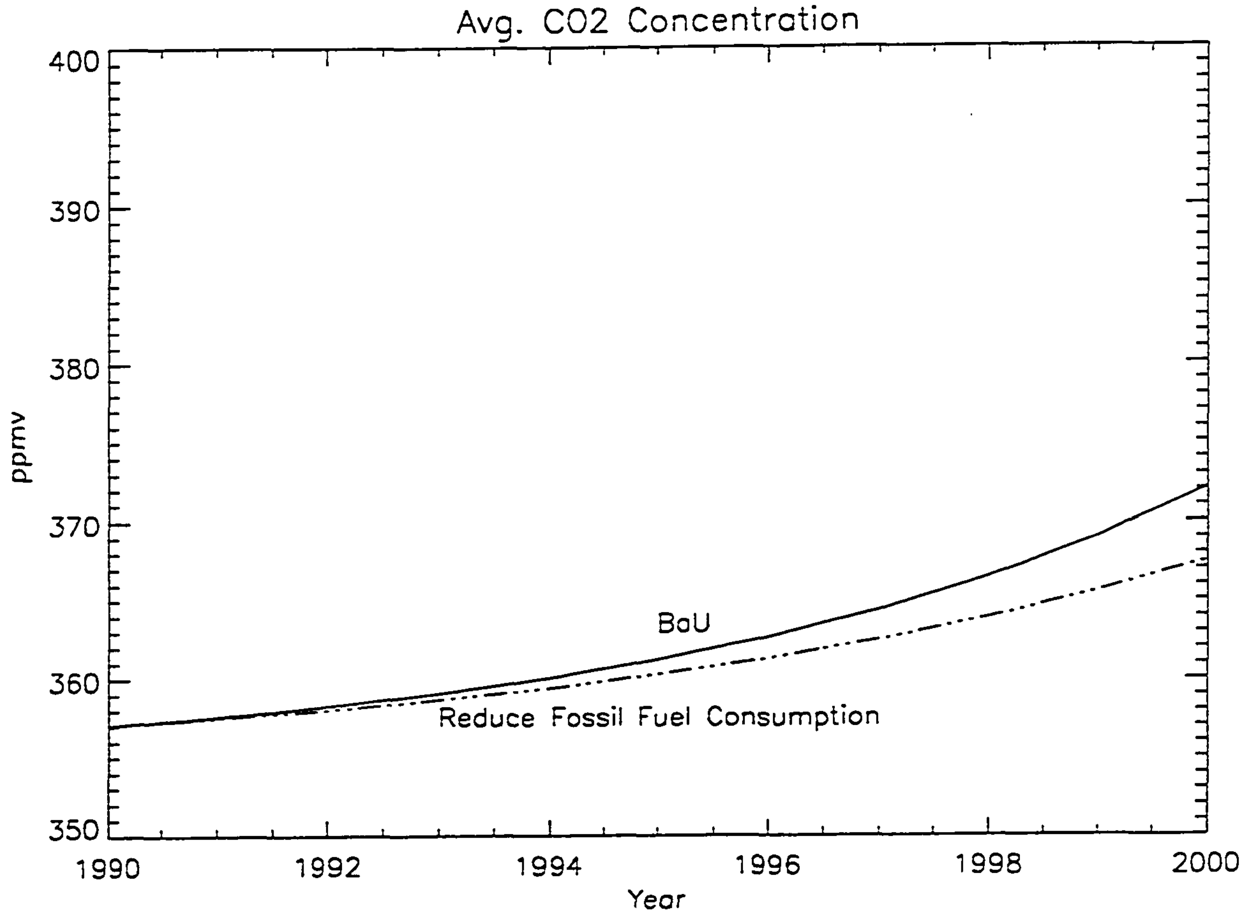


Figure 10.9 Doubled CO_2

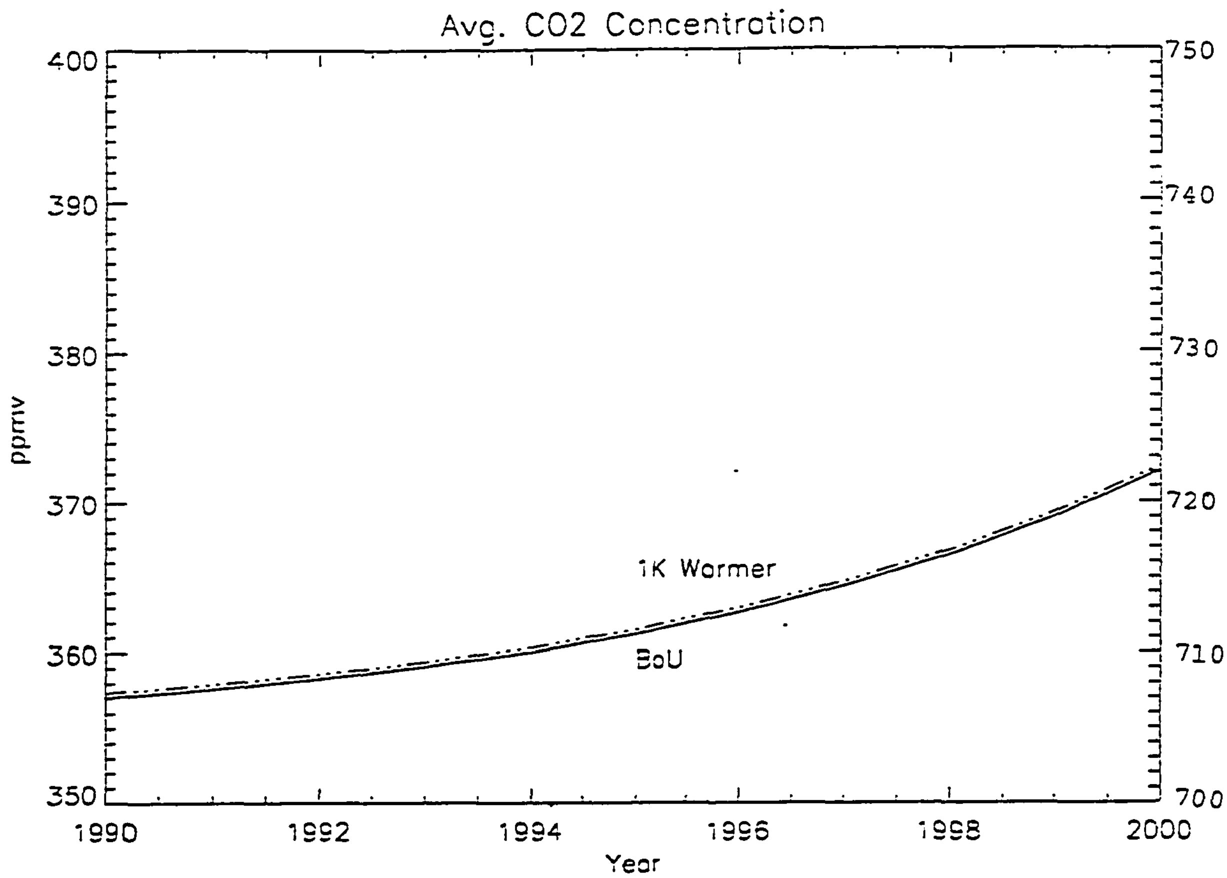


Figure 10.10 Global BMB alone

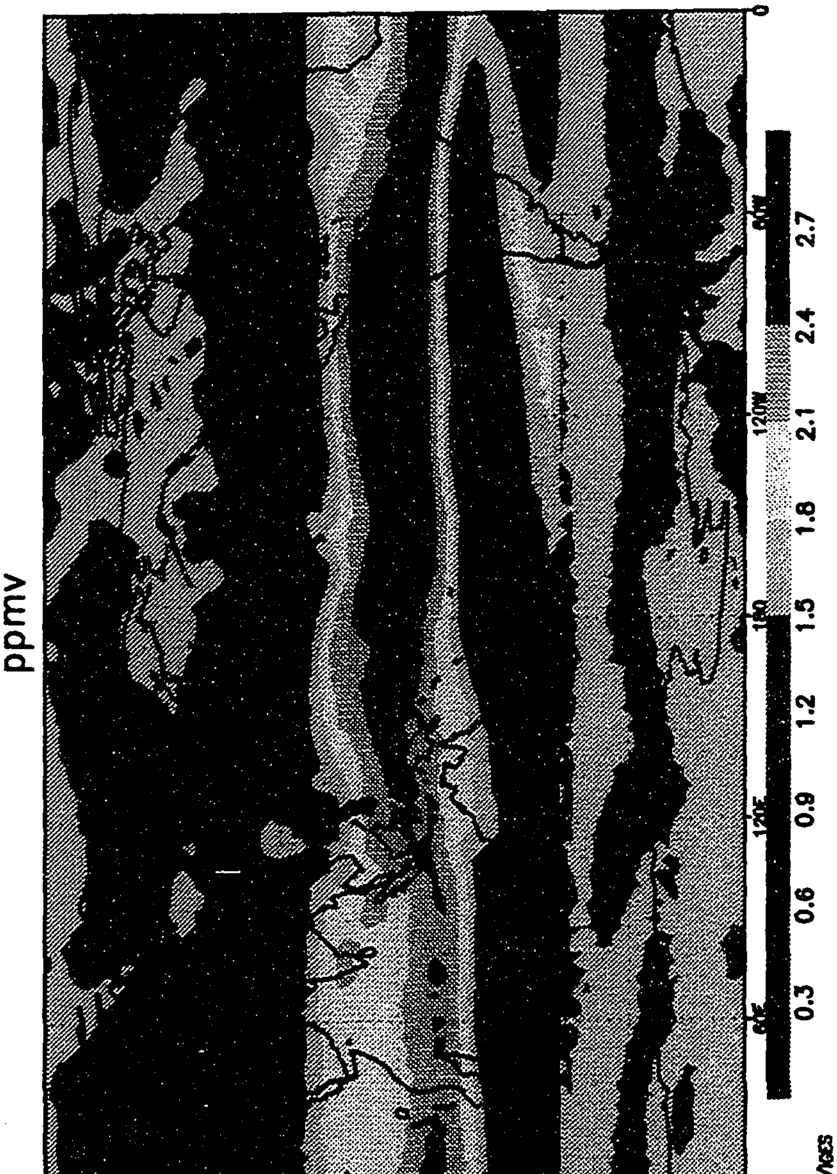

ppmv
90N
60N
30N
EQ
30S
60S
90S
0
60E
120E
180
120W
60W
0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4
2.7
GrADS: COLA/IGES

Figure 10.11 Global FFC alone

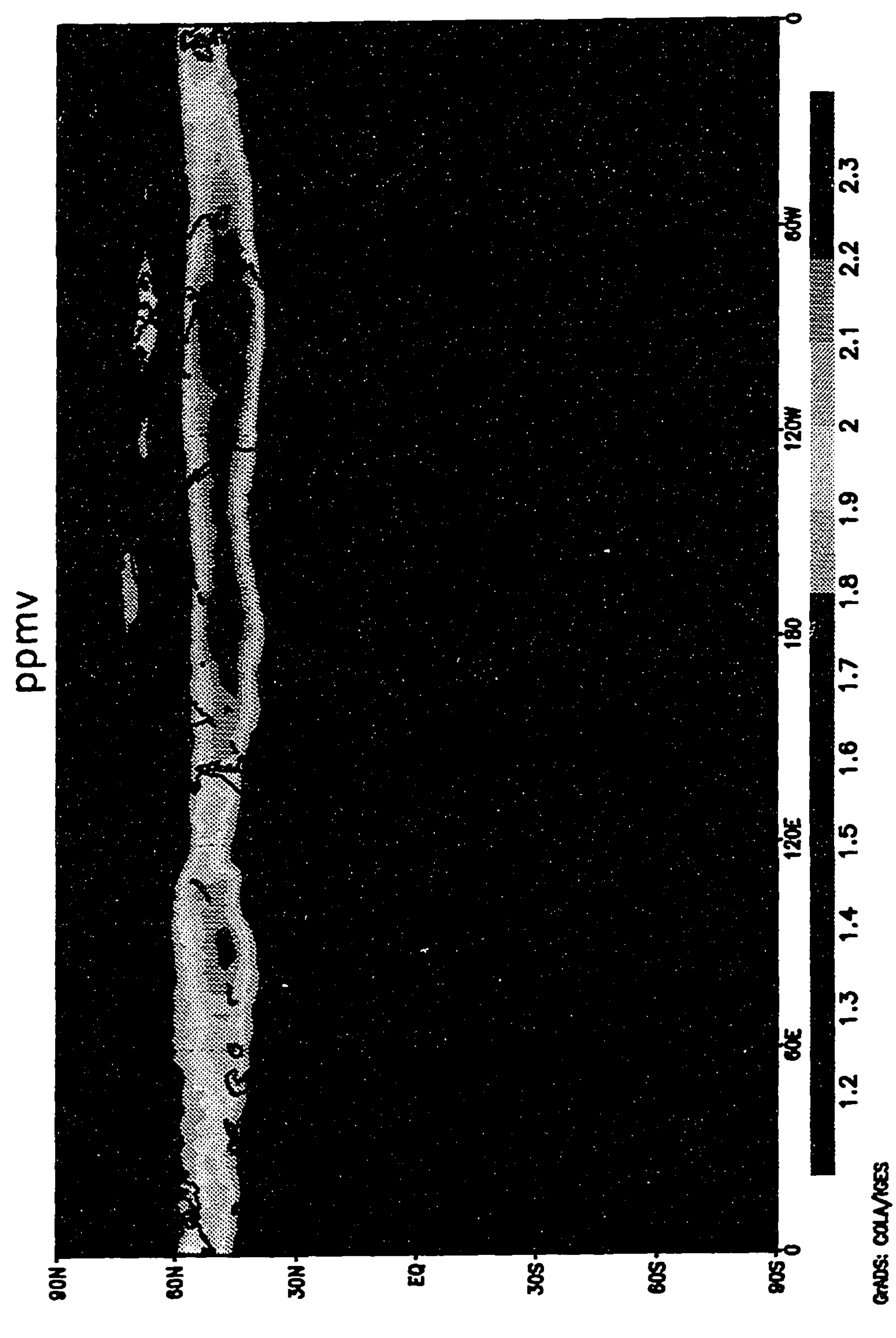

ppmv
90N
60N
30N
EQ
30S
60S
90S
0
60E
120E
180
120W
60W
0
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2
2.1
2.2
2.3
GrADS: COLA/IGES

Figure 10.13 Monthly Average Fluxes for March
(-177.5, -122.5)x(-87.5, -32.5) (longitude)x(latitude)

-32.5	NET=-0.0044 FFC= 0.0000 BMB= 0.0000 OCN=-0.0044 TBS= 0.0000	NET=-0.0053 FFC= 0.0000 BMB= 0.0000 OCN=-0.0053 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0024 FFC= 0.0000 BMB= 0.0000 OCN=-0.0024 TBS= 0.0000	NET=-0.0010 FFC= 0.0000 BMB= 0.0000 OCN=-0.0010 TBS= 0.0000	NET=-0.0011 FFC= 0.0000 BMB= 0.0000 OCN=-0.0011 TBS= 0.0000	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0010 FFC= 0.0000 BMB= 0.0000 OCN=-0.0010 TBS= 0.0000	NET=-0.0052 FFC= 0.0000 BMB= 0.0000 OCN=-0.0052 TBS= 0.0000
-37.5	NET=-0.0007 FFC= 0.0000 BMB= 0.0000 OCN=-0.0007 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0005 FFC= 0.0000 BMB= 0.0000 OCN=-0.0005 TBS= 0.0000	NET=-0.0005 FFC= 0.0000 BMB= 0.0000 OCN=-0.0005 TBS= 0.0000	NET=-0.0008 FFC= 0.0000 BMB= 0.0000 OCN=-0.0008 TBS= 0.0000	NET=-0.0005 FFC= 0.0000 BMB= 0.0000 OCN=-0.0005 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0012 FFC= 0.0000 BMB= 0.0000 OCN=-0.0012 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000
-42.5	NET=-0.0007 FFC= 0.0000 BMB= 0.0000 OCN=-0.0007 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0034 FFC= 0.0000 BMB= 0.0000 OCN=-0.0034 TBS= 0.0000	NET=-0.0009 FFC= 0.0000 BMB= 0.0000 OCN=-0.0009 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0156 FFC= 0.0000 BMB= 0.0000 OCN=-0.0156 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0075 FFC= 0.0000 BMB= 0.0000 OCN=-0.0075 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0021 FFC= 0.0000 BMB= 0.0000 OCN=-0.0021 TBS= 0.0000	NET=-0.0072 FFC= 0.0000 BMB= 0.0000 OCN=-0.0072 TBS= 0.0000	NET=-0.0066 FFC= 0.0000 BMB= 0.0000 OCN=-0.0066 TBS= 0.0000
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-52.5	NET=-0.0428 FFC= 0.0000 BMB= 0.0000 OCN=-0.0428 TBS= 0.0000	NET=-0.0413 FFC= 0.0000 BMB= 0.0000 OCN=-0.0413 TBS= 0.0000	NET=-0.0246 FFC= 0.0000 BMB= 0.0000 OCN=-0.0246 TBS= 0.0000	NET=-0.0063 FFC= 0.0000 BMB= 0.0000 OCN=-0.0063 TBS= 0.0000	NET=-0.0020 FFC= 0.0000 BMB= 0.0000 OCN=-0.0020 TBS= 0.0000	NET=-0.0038 FFC= 0.0000 BMB= 0.0000 OCN=-0.0038 TBS= 0.0000	NET=-0.0275 FFC= 0.0000 BMB= 0.0000 OCN=-0.0275 TBS= 0.0000	NET=-0.0137 FFC= 0.0000 BMB= 0.0000 OCN=-0.0137 TBS= 0.0000	NET=-0.0082 FFC= 0.0000 BMB= 0.0000 OCN=-0.0082 TBS= 0.0000	NET=-0.0106 FFC= 0.0000 BMB= 0.0000 OCN=-0.0106 TBS= 0.0000	NET=-0.0155 FFC= 0.0000 BMB= 0.0000 OCN=-0.0155 TBS= 0.0000	NET=-0.0103 FFC= 0.0000 BMB= 0.0000 OCN=-0.0103 TBS= 0.0000
-57.5	NET=-0.0374 FFC= 0.0000 BMB= 0.0000 OCN=-0.0374 TBS= 0.0000	NET=-0.0282 FFC= 0.0000 BMB= 0.0000 OCN=-0.0282 TBS= 0.0000	NET=-0.0306 FFC= 0.0000 BMB= 0.0000 OCN=-0.0306 TBS= 0.0000	NET=-0.0067 FFC= 0.0000 BMB= 0.0000 OCN=-0.0067 TBS= 0.0000	NET=-0.0288 FFC= 0.0000 BMB= 0.0000 OCN=-0.0288 TBS= 0.0000	NET=-0.0183 FFC= 0.0000 BMB= 0.0000 OCN=-0.0183 TBS= 0.0000	NET=-0.0244 FFC= 0.0000 BMB= 0.0000 OCN=-0.0244 TBS= 0.0000	NET=-0.0131 FFC= 0.0000 BMB= 0.0000 OCN=-0.0131 TBS= 0.0000	NET=-0.0062 FFC= 0.0000 BMB= 0.0000 OCN=-0.0062 TBS= 0.0000	NET=-0.0018 FFC= 0.0000 BMB= 0.0000 OCN=-0.0018 TBS= 0.0000	NET=-0.0170 FFC= 0.0000 BMB= 0.0000 OCN=-0.0170 TBS= 0.0000	NET=-0.0114 FFC= 0.0000 BMB= 0.0000 OCN=-0.0114 TBS= 0.0000
-62.5	NET=-0.0190 FFC= 0.0000 BMB= 0.0000 OCN=-0.0190 TBS= 0.0000	NET=-0.0142 FFC= 0.0000 BMB= 0.0000 OCN=-0.0142 TBS= 0.0000	NET=-0.0078 FFC= 0.0000 BMB= 0.0000 OCN=-0.0078 TBS= 0.0000	NET=-0.0035 FFC= 0.0000 BMB= 0.0000 OCN=-0.0036 TBS= 0.0000	NET=-0.0011 FFC= 0.0000 BMB= 0.0000 OCN=-0.0011 TBS= 0.0000	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET=-0.0080 FFC= 0.0000 BMB= 0.0000 OCN=-0.0080 TBS= 0.0000	NET=-0.0020 FFC= 0.0000 BMB= 0.0000 OCN=-0.0020 TBS= 0.0000	NET=-0.0008 FFC= 0.0000 BMB= 0.0000 OCN=-0.0008 TBS= 0.0000	NET=-0.0011 FFC= 0.0000 BMB= 0.0000 OCN=-0.0011 TBS= 0.0000	NET=-0.0024 FFC= 0.0000 BMB= 0.0000 OCN=-0.0024 TBS= 0.0000	NET=-0.0070 FFC= 0.0000 BMB= 0.0000 OCN=-0.0070 TBS= 0.0000
-67.5	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0007 FFC= 0.0000 BMB= 0.0000 OCN=-0.0007 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000
-72.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-77.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-82.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-87.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
	-177.5	-172.5	-167.5	-162.5	-157.5	-152.5	-147.5	-142.5	-137.5	-132.5	-127.5	-122.5

Figure 10.14 Monthly Average Fluxes for March
(-177.5, -122.5)x(-27.5, 27.5) (longitude)x(latitude)

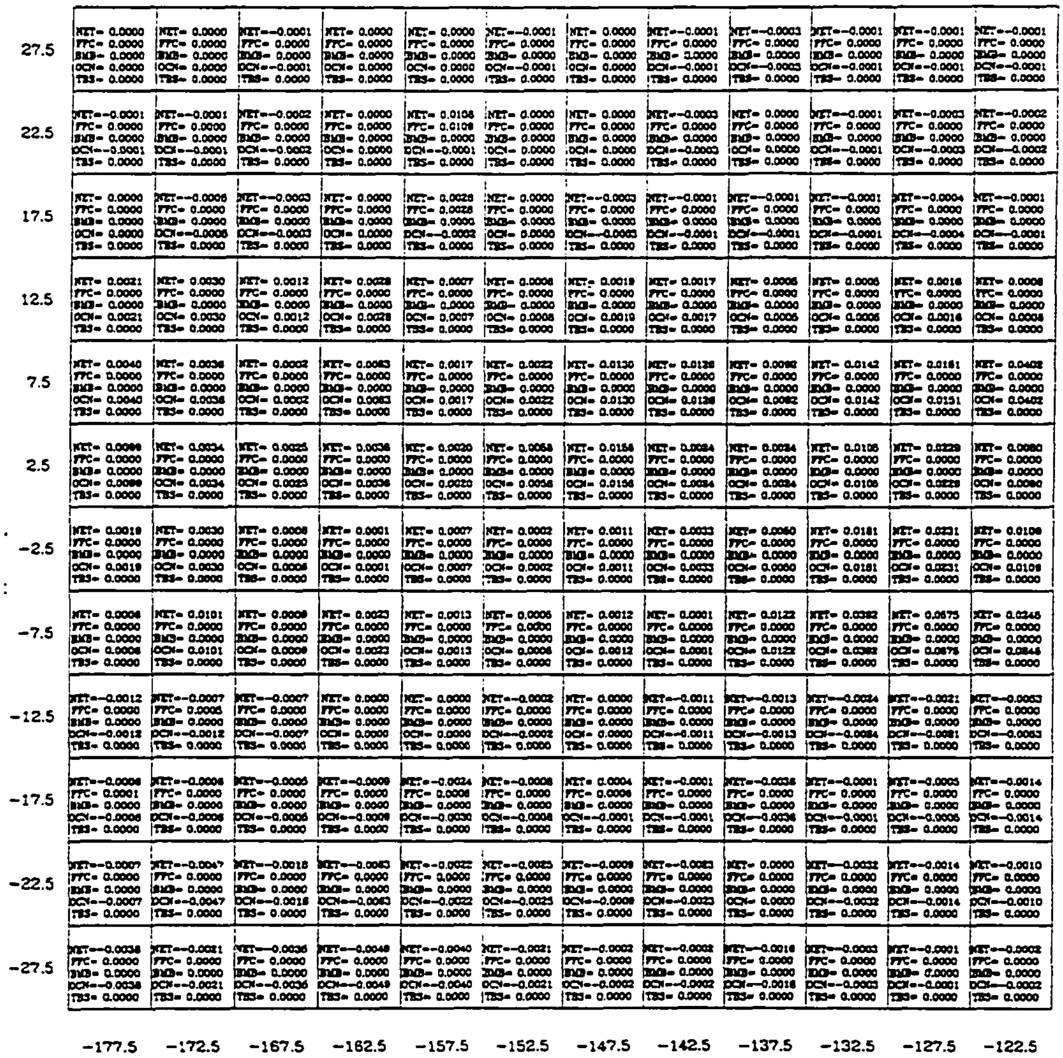

Figure 10.15 Monthly Average Fluxes for March
(-177.5, -122.5)x(32.5, 87.5) (longitude)x(latitude)

Lat \ Lon	-177.5	-172.5	-167.5	-162.5	-157.5	-152.5	-147.5	-142.5	-137.5	-132.5	-127.5	-122.5
87.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
82.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
77.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
72.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0006 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0005 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0002 FFC= 0.0002 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
67.5	NET= 0.0158 FFC= 0.0158 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0068 FFC= 0.0068 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0003 FFC= 0.0003 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0015 FFC= 0.0014 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0018 FFC= 0.0018 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0021 FFC= 0.0021 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0018 FFC= 0.0018 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0003 FFC= 0.0003 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0001 FFC= 0.0001 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
62.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0002 FFC= 0.0002 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0020 FFC= 0.0015 BMB= 0.0000 OCN= 0.0000 TBS= 0.0005	NET= 0.0035 FFC= 0.0013 BMB= 0.0000 OCN= 0.0000 TBS= 0.0021	NET= 0.0041 FFC= 0.0008 BMB= 0.0000 OCN= 0.0000 TBS= 0.0033	NET= 0.0351 FFC= 0.0330 BMB= 0.0000 OCN= 0.0000 TBS= 0.0021	NET= 0.0032 FFC= 0.0014 BMB= 0.0000 OCN= 0.0000 TBS= 0.0019	NET= 0.0028 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS= 0.0023	NET= 0.0019 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0018	NET= 0.0006 FFC= 0.0001 BMB= 0.0000 OCN= 0.0000 TBS= 0.0004	NET= 0.0001 FFC= 0.0001 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
57.5	NET= 0.0083 FFC= 0.0000 BMB= 0.0000 OCN= 0.0083 TBS= 0.0000	NET= 0.0069 FFC= 0.0000 BMB= 0.0000 OCN= 0.0069 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0016 FFC= 0.0002 BMB= 0.0000 OCN= 0.0000 TBS= 0.0013	NET= 0.0086 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS= 0.0081	NET= 0.0128 FFC= 0.0009 BMB= 0.0000 OCN= 0.0000 TBS= 0.0119	NET= 0.0069 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0069	NET= 0.0121 FFC= 0.0000 BMB= 0.0000 OCN= 0.0060 TBS= 0.0061	NET= 0.0086 FFC= 0.0011 BMB= 0.0000 OCN= 0.0000 TBS= 0.0075	NET= 0.0124 FFC= 0.0032 BMB= 0.0000 OCN= 0.0000 TBS= 0.0092	NET= 0.0092 FFC= 0.0032 BMB= 0.0000 OCN= 0.0000 TBS= 0.0060	NET= 0.0066 FFC= 0.0024 BMB= 0.0000 OCN= 0.0000 TBS= 0.0042
52.5	NET= 0.0180 FFC= 0.0000 BMB= 0.0000 OCN= 0.0180 TBS= 0.0000	NET= 0.0250 FFC= 0.0000 BMB= 0.0000 OCN= 0.0250 TBS= 0.0000	NET= 0.0018 FFC= 0.0000 BMB= 0.0000 OCN= 0.0018 TBS= 0.0000	NET= 0.0002 FFC= 0.0000 BMB= 0.0000 OCN= 0.0002 TBS= 0.0001	NET= 0.0018 FFC= 0.0000 BMB= 0.0000 OCN= 0.0006 TBS= 0.0013	NET= 0.0296 FFC= 0.0000 BMB= 0.0000 OCN= 0.0284 TBS= 0.0012	NET= 0.0152 FFC= 0.0000 BMB= 0.0000 OCN= 0.0152 TBS= 0.0000	NET= 0.0037 FFC= 0.0000 BMB= 0.0000 OCN= 0.0037 TBS= 0.0000	NET= 0.0288 FFC= 0.0000 BMB= 0.0000 OCN= 0.0288 TBS= 0.0000	NET= 0.0042 FFC= 0.0002 BMB= 0.0000 OCN= 0.0008 TBS= 0.0033	NET= 0.0157 FFC= 0.0027 BMB= 0.0000 OCN= 0.0000 TBS= 0.0130	NET= 0.0231 FFC= 0.0065 BMB= 0.0000 OCN= 0.0000 TBS= 0.0166
47.5	NET= 0.0133 FFC= 0.0000 BMB= 0.0000 OCN= 0.0133 TBS= 0.0000	NET= 0.0381 FFC= 0.0000 BMB= 0.0000 OCN= 0.0381 TBS= 0.0000	NET= 0.0042 FFC= 0.0000 BMB= 0.0000 OCN= 0.0042 TBS= 0.0000	NET= 0.0241 FFC= 0.0000 BMB= 0.0000 OCN= 0.0241 TBS= 0.0000	NET= 0.0336 FFC= 0.0000 BMB= 0.0000 OCN= 0.0336 TBS= 0.0000	NET= 0.0204 FFC= 0.0000 BMB= 0.0000 OCN= 0.0204 TBS= 0.0000	NET= 0.0128 FFC= 0.0000 BMB= 0.0000 OCN= 0.0128 TBS= 0.0000	NET= 0.0044 FFC= 0.0000 BMB= 0.0000 OCN= 0.0044 TBS= 0.0000	NET= 0.0410 FFC= 0.0000 BMB= 0.0000 OCN= 0.0410 TBS= 0.0000	NET= 0.0287 FFC= 0.0000 BMB= 0.0000 OCN= 0.0289 TBS=-0.0002	NET= 0.0056 FFC= 0.0002 BMB= 0.0000 OCN= 0.0017 TBS= 0.0036	NET= 0.1251 FFC= 0.1099 BMB= 0.0000 OCN= 0.0000 TBS= 0.0152
42.5	NET= 0.0321 FFC= 0.0000 BMB= 0.0000 OCN= 0.0321 TBS= 0.0000	NET= 0.0353 FFC= 0.0000 BMB= 0.0000 OCN= 0.0363 TBS= 0.0000	NET= 0.0301 FFC= 0.0000 BMB= 0.0000 OCN= 0.0301 TBS= 0.0000	NET= 0.0380 FFC= 0.0000 BMB= 0.0000 OCN= 0.0380 TBS= 0.0000	NET= 0.0345 FFC= 0.0000 BMB= 0.0000 OCN= 0.0345 TBS= 0.0000	NET= 0.0340 FFC= 0.0000 BMB= 0.0000 OCN= 0.0340 TBS= 0.0000	NET= 0.0036 FFC= 0.0000 BMB= 0.0000 OCN= 0.0036 TBS= 0.0000	NET= 0.0092 FFC= 0.0000 BMB= 0.0000 OCN= 0.0092 TBS= 0.0000	NET= 0.0160 FFC= 0.0000 BMB= 0.0000 OCN= 0.0160 TBS= 0.0000	NET= 0.0408 FFC= 0.0000 BMB= 0.0000 OCN= 0.0408 TBS= 0.0000	NET= 0.0088 FFC= 0.0000 BMB= 0.0000 OCN= 0.0087 TBS= 0.0001	NET= 0.0214 FFC= 0.0128 BMB= 0.0000 OCN= 0.0000 TBS= 0.0086
37.5	NET= 0.0209 FFC= 0.0000 BMB= 0.0000 OCN= 0.0209 TBS= 0.0000	NET= 0.0044 FFC= 0.0000 BMB= 0.0000 OCN= 0.0044 TBS= 0.0000	NET= 0.0112 FFC= 0.0000 BMB= 0.0000 OCN= 0.0112 TBS= 0.0000	NET= 0.0122 FFC= 0.0000 BMB= 0.0000 OCN= 0.0122 TBS= 0.0000	NET= 0.0133 FFC= 0.0000 BMB= 0.0000 OCN= 0.0133 TBS= 0.0000	NET= 0.0069 FFC= 0.0000 BMB= 0.0000 OCN= 0.0069 TBS= 0.0000	NET= 0.0045 FFC= 0.0000 BMB= 0.0000 OCN= 0.0045 TBS= 0.0000	NET= 0.0088 FFC= 0.0000 BMB= 0.0000 OCN= 0.0088 TBS= 0.0000	NET= 0.0120 FFC= 0.0000 BMB= 0.0000 OCN= 0.0120 TBS= 0.0000	NET= 0.0148 FFC= 0.0000 BMB= 0.0000 OCN= 0.0148 TBS= 0.0000	NET= 0.0136 FFC= 0.0000 BMB= 0.0000 OCN= 0.0136 TBS= 0.0000	NET= 0.1101 FFC= 0.1055 BMB= 0.0000 OCN= 0.0000 TBS= 0.0046
32.5	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS=-0.0005

Figure 10.16 Monthly Average Fluxes for March
(-117.5, -62.5)x(-87.5, -32.5) (longitude)x(latitude)

	-117.5	-112.5	-107.5	-102.5	-97.5	-92.5	-87.5	-82.5	-77.5	-72.5	-67.5	-62.5
-32.5	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0008 FFC= 0.0000 BMB= 0.0000 OCN=-0.0008 TBS= 0.0000	NET=-0.0011 FFC= 0.0000 BMB= 0.0000 OCN=-0.0011 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0005 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000	NET= 0.0124 FFC= 0.0128 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0078 FFC= 0.0081 BMB= 0.0000 OCN= 0.0000 TBS=-0.0159	NET= 0.0030 FFC= 0.0140 BMB= 0.0000 OCN= 0.0000 TBS=-0.0110
-37.5	NET=-0.0042 FFC= 0.0000 BMB= 0.0000 OCN=-0.0042 TBS= 0.0000	NET=-0.0008 FFC= 0.0000 BMB= 0.0000 OCN=-0.0008 TBS= 0.0000	NET=-0.0009 FFC= 0.0000 BMB= 0.0000 OCN=-0.0009 TBS= 0.0000	NET=-0.0005 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0028 FFC= 0.0000 BMB= 0.0000 OCN=-0.0028 TBS= 0.0000	NET=-0.0018 FFC= 0.0000 BMB= 0.0000 OCN=-0.0018 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0011 FFC= 0.0000 BMB= 0.0000 OCN=-0.0011 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET= 0.0038 FFC= 0.0055 BMB= 0.0000 OCN= 0.0000 TBS=-0.0016	NET=-0.0111 FFC= 0.0048 BMB= 0.0000 OCN= 0.0000 TBS=-0.0159	NET= 0.0018 FFC= 0.0053 BMB= 0.0000 OCN= 0.0000 TBS=-0.0035
-42.5	NET=-0.0101 FFC= 0.0000 BMB= 0.0000 OCN=-0.0101 TBS= 0.0000	NET=-0.0040 FFC= 0.0000 BMB= 0.0000 OCN=-0.0040 TBS= 0.0000	NET=-0.0039 FFC= 0.0000 BMB= 0.0000 OCN=-0.0039 TBS= 0.0000	NET=-0.0035 FFC= 0.0000 BMB= 0.0000 OCN=-0.0036 TBS= 0.0000	NET=-0.0010 FFC= 0.0000 BMB= 0.0000 OCN=-0.0010 TBS= 0.0000	NET=-0.0112 FFC= 0.0000 BMB= 0.0000 OCN=-0.0112 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0101 FFC= 0.0000 BMB= 0.0000 OCN=-0.0101 TBS= 0.0000	NET=-0.0060 FFC= 0.0000 BMB= 0.0000 OCN=-0.0060 TBS= 0.0000	NET=-0.0005 FFC= 0.0036 BMB= 0.0000 OCN= 0.0000 TBS=-0.0041	NET= 0.0201 FFC= 0.0048 BMB= 0.0000 OCN= 0.0000 TBS= 0.0153	NET=-0.0003 FFC= 0.0008 BMB= 0.0000 OCN= 0.0000 TBS=-0.0011
-47.5	NET=-0.0086 FFC= 0.0000 BMB= 0.0000 OCN=-0.0086 TBS= 0.0000	NET=-0.0022 FFC= 0.0000 BMB= 0.0000 OCN=-0.0022 TBS= 0.0000	NET=-0.0032 FFC= 0.0000 BMB= 0.0000 OCN=-0.0032 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0100 FFC= 0.0000 BMB= 0.0000 OCN=-0.0100 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0246 FFC= 0.0000 BMB= 0.0000 OCN=-0.0246 TBS= 0.0000	NET=-0.0230 FFC= 0.0000 BMB= 0.0000 OCN=-0.0230 TBS= 0.0000	NET=-0.0198 FFC= 0.0000 BMB= 0.0000 OCN=-0.0198 TBS= 0.0000	NET=-0.0082 FFC= 0.0027 BMB= 0.0000 OCN= 0.0000 TBS=-0.0110	NET= 0.0228 FFC= 0.0027 BMB= 0.0000 OCN= 0.0000 TBS= 0.0201	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS=-0.0002
-52.5	NET=-0.0123 FFC= 0.0000 BMB= 0.0000 OCN=-0.0123 TBS= 0.0000	NET=-0.0042 FFC= 0.0000 BMB= 0.0000 OCN=-0.0042 TBS= 0.0000	NET=-0.0331 FFC= 0.0000 BMB= 0.0000 OCN=-0.0331 TBS= 0.0000	NET=-0.0142 FFC= 0.0000 BMB= 0.0000 OCN=-0.0142 TBS= 0.0000	NET=-0.0038 FFC= 0.0000 BMB= 0.0000 OCN=-0.0038 TBS= 0.0000	NET=-0.0015 FFC= 0.0000 BMB= 0.0000 OCN=-0.0015 TBS= 0.0000	NET=-0.0007 FFC= 0.0000 BMB= 0.0000 OCN=-0.0007 TBS= 0.0000	NET=-0.0098 FFC= 0.0000 BMB= 0.0000 OCN=-0.0098 TBS= 0.0000	NET=-0.0008 FFC= 0.0000 BMB= 0.0000 OCN=-0.0008 TBS= 0.0000	NET=-0.0087 FFC= 0.0018 BMB= 0.0000 OCN= 0.0000 TBS=-0.0105	NET= 0.0078 FFC= 0.0018 BMB= 0.0000 OCN= 0.0000 TBS= 0.0060	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-57.5	NET=-0.0177 FFC= 0.0000 BMB= 0.0000 OCN=-0.0177 TBS= 0.0000	NET=-0.0046 FFC= 0.0000 BMB= 0.0000 OCN=-0.0045 TBS= 0.0000	NET=-0.0103 FFC= 0.0000 BMB= 0.0000 OCN=-0.0103 TBS= 0.0000	NET=-0.0180 FFC= 0.0000 BMB= 0.0000 OCN=-0.0130 TBS= 0.0000	NET=-0.0119 FFC= 0.0000 BMB= 0.0000 OCN=-0.0119 TBS= 0.0000	NET=-0.0084 FFC= 0.0000 BMB= 0.0000 OCN=-0.0084 TBS= 0.0000	NET=-0.0139 FFC= 0.0000 BMB= 0.0000 OCN=-0.0139 TBS= 0.0000	NET=-0.0096 FFC= 0.0000 BMB= 0.0000 OCN=-0.0096 TBS= 0.0000	NET=-0.0070 FFC= 0.0000 BMB= 0.0000 OCN=-0.0070 TBS= 0.0000	NET=-0.0042 FFC= 0.0000 BMB= 0.0000 OCN=-0.0035 TBS=-0.0007	NET=-0.0036 FFC= 0.0000 BMB= 0.0000 OCN=-0.0014 TBS=-0.0022	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000
-62.5	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET=-0.0027 FFC= 0.0000 BMB= 0.0000 OCN=-0.0027 TBS= 0.0000	NET=-0.0047 FFC= 0.0000 BMB= 0.0000 OCN=-0.0047 TBS= 0.0000	NET=-0.0032 FFC= 0.0000 BMB= 0.0000 OCN=-0.0032 TBS= 0.0000	NET=-0.0025 FFC= 0.0000 BMB= 0.0000 OCN=-0.0025 TBS= 0.0000	NET=-0.0065 FFC= 0.0000 BMB= 0.0000 OCN=-0.0065 TBS= 0.0000	NET=-0.0098 FFC= 0.0000 BMB= 0.0000 OCN=-0.0098 TBS= 0.0000	NET=-0.0103 FFC= 0.0000 BMB= 0.0000 OCN=-0.0103 TBS= 0.0000	NET=-0.0080 FFC= 0.0000 BMB= 0.0000 OCN=-0.0080 TBS= 0.0000	NET=-0.0068 FFC= 0.0000 BMB= 0.0000 OCN=-0.0068 TBS= 0.0000	NET=-0.0075 FFC= 0.0000 BMB= 0.0000 OCN=-0.0075 TBS= 0.0000	NET=-0.0016 FFC= 0.0000 BMB= 0.0000 OCN=-0.0016 TBS= 0.0000
-67.5	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0007 FFC= 0.0000 BMB= 0.0000 OCN=-0.0007 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-72.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-77.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-82.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-87.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000

Figure 10.17 Monthly Average Fluxes for March
(-117.5, -62.5)x(-27.5, 27.5) (longitude)x(latitude)

	-117.5	-112.5	-107.5	-102.5	-97.5	-92.5
27.5	NET=-0.0014 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS=-0.0014	NET= 0.0057 FFC= 0.0129 BMB= 0.0000 OCN= 0.0000 TBS=-0.0073	NET= 0.0243 FFC= 0.0242 BMB= 0.0000 OCN= 0.0000 TBS= 0.0003	NET= 0.0341 FFC= 0.0341 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.2435 FFC= 0.2503 BMB= 0.0000 OCN= 0.0000 TBS=-0.0068	NET= 0.2725 FFC= 0.0734 BMB= 0.1896 OCN= 0.0000 TBS= 0.0094
22.5	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET= 0.0005 FFC= 0.0018 BMB= 0.0000 OCN= 0.0000 TBS=-0.0013	NET= 0.0074 FFC= 0.0081 BMB= 0.0000 OCN= 0.0000 TBS=-0.0007	NET= 0.0370 FFC= 0.0387 BMB= 0.0000 OCN= 0.0000 TBS=-0.0018	NET= 0.1388 FFC= 0.0142 BMB= 0.1263 OCN= 0.0000 TBS=-0.0018	NET= 0.2862 FFC= 0.0009 BMB= 0.2842 OCN= 0.0000 TBS= 0.0011
17.5	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS=-0.0001	NET= 0.0108 FFC= 0.0107 BMB= 0.0000 OCN= 0.0000 TBS= 0.0001	NET= 0.0795 FFC= 0.0760 BMB= 0.0000 OCN= 0.0000 TBS= 0.0036	NET= 0.0131 FFC= 0.0156 BMB= 0.0000 OCN= 0.0000 TBS=-0.0025
12.5	NET= 0.0042 FFC= 0.0000 BMB= 0.0000 OCN= 0.0042 TBS= 0.0000	NET= 0.0018 FFC= 0.0000 BMB= 0.0000 OCN= 0.0018 TBS= 0.0000	NET= 0.0041 FFC= 0.0000 BMB= 0.0000 OCN= 0.0041 TBS= 0.0000	NET= 0.0044 FFC= 0.0000 BMB= 0.0000 OCN= 0.0040 TBS= 0.0004	NET= 0.0022 FFC= 0.0000 BMB= 0.0000 OCN= 0.0015 TBS= 0.0007	NET= 0.0009 FFC= 0.0007 BMB= 0.0000 OCN= 0.0023 TBS=-0.0021
7.5	NET= 0.0386 FFC= 0.0000 BMB= 0.0000 OCN= 0.0386 TBS= 0.0000	NET= 0.0373 FFC= 0.0000 BMB= 0.0000 OCN= 0.0373 TBS= 0.0000	NET= 0.0046 FFC= 0.0000 BMB= 0.0000 OCN= 0.0046 TBS= 0.0000	NET= 0.0008 FFC= 0.0000 BMB= 0.0000 OCN= 0.0008 TBS= 0.0000	NET= 0.0254 FFC= 0.0000 BMB= 0.0000 OCN= 0.0234 TBS= 0.0020	NET= 0.0128 FFC= 0.0000 BMB= 0.0000 OCN= 0.0129 TBS=-0.0001
2.5	NET= 0.0016 FFC= 0.0000 BMB= 0.0000 OCN= 0.0016 TBS= 0.0000	NET= 0.0133 FFC= 0.0000 BMB= 0.0000 OCN= 0.0133 TBS= 0.0000	NET= 0.0061 FFC= 0.0000 BMB= 0.0000 OCN= 0.0061 TBS= 0.0000	NET= 0.0014 FFC= 0.0000 BMB= 0.0000 OCN= 0.0014 TBS= 0.0000	NET= 0.0052 FFC= 0.0000 BMB= 0.0000 OCN= 0.0052 TBS= 0.0000	NET= 0.0058 FFC= 0.0000 BMB= 0.0000 OCN= 0.0058 TBS= 0.0000
-2.5	NET= 0.0038 FFC= 0.0000 BMB= 0.0000 OCN= 0.0038 TBS= 0.0000	NET= 0.0036 FFC= 0.0000 BMB= 0.0000 OCN= 0.0036 TBS= 0.0000	NET= 0.0152 FFC= 0.0000 BMB= 0.0000 OCN= 0.0152 TBS= 0.0000	NET= 0.0165 FFC= 0.0000 BMB= 0.0000 OCN= 0.0165 TBS= 0.0000	NET= 0.0183 FFC= 0.0000 BMB= 0.0000 OCN= 0.0183 TBS= 0.0000	NET= 0.0078 FFC= 0.0000 BMB= 0.0000 OCN= 0.0078 TBS= 0.0000
-7.5	NET= 0.0117 FFC= 0.0000 BMB= 0.0000 OCN= 0.0117 TBS= 0.0000	NET= 0.0299 FFC= 0.0000 BMB= 0.0000 OCN= 0.0299 TBS= 0.0000	NET= 0.0153 FFC= 0.0000 BMB= 0.0000 OCN= 0.0153 TBS= 0.0000	NET= 0.0432 FFC= 0.0000 BMB= 0.0000 OCN= 0.0432 TBS= 0.0000	NET= 0.0089 FFC= 0.0000 BMB= 0.0000 OCN= 0.0089 TBS= 0.0000	NET= 0.0419 FFC= 0.0000 BMB= 0.0000 OCN= 0.0419 TBS= 0.0000
-12.5	NET=-0.0046 FFC= 0.0000 BMB= 0.0000 OCN=-0.0046 TBS= 0.0000	NET=-0.0019 FFC= 0.0000 BMB= 0.0000 OCN=-0.0019 TBS= 0.0000	NET=-0.0019 FFC= 0.0000 BMB= 0.0000 OCN=-0.0019 TBS= 0.0000	NET=-0.0032 FFC= 0.0000 BMB= 0.0000 OCN=-0.0032 TBS= 0.0000	NET=-0.0025 FFC= 0.0000 BMB= 0.0000 OCN=-0.0025 TBS= 0.0000	NET=-0.0040 FFC= 0.0000 BMB= 0.0000 OCN=-0.0040 TBS= 0.0000
-17.5	NET=-0.0035 FFC= 0.0000 BMB= 0.0000 OCN=-0.0035 TBS= 0.0000	NET=-0.0080 FFC= 0.0000 BMB= 0.0000 OCN=-0.0080 TBS= 0.0000	NET=-0.0020 FFC= 0.0000 BMB= 0.0000 OCN=-0.0020 TBS= 0.0000	NET=-0.0013 FFC= 0.0000 BMB= 0.0000 OCN=-0.0013 TBS= 0.0000	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000
-22.5	NET=-0.0014 FFC= 0.0000 BMB= 0.0000 OCN=-0.0014 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0018 FFC= 0.0000 BMB= 0.0000 OCN=-0.0018 TBS= 0.0000	NET=-0.0031 FFC= 0.0000 BMB= 0.0000 OCN=-0.0031 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-27.5	NET=-0.0008 FFC= 0.0000 BMB= 0.0000 OCN=-0.0008 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0036 FFC= 0.0000 BMB= 0.0000 OCN=-0.0036 TBS= 0.0000	NET=-0.0017 FFC= 0.0000 BMB= 0.0000 OCN=-0.0017 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0011 FFC= 0.0000 BMB= 0.0000 OCN=-0.0011 TBS= 0.0000

	-87.5	-82.5	-77.5	-72.5	-67.5	-62.5
27.5	NET= 0.0132 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0132	NET= 0.2862 FFC= 0.1163 BMB= 0.1421 OCN= 0.0000 TBS= 0.0059	NET= 0.0039 FFC= 0.0010 BMB= 0.0000 OCN= 0.0000 TBS= 0.0029	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000
22.5	NET= 0.6054 FFC= 0.0054 BMB= 0.6000 OCN=-0.0014 TBS= 0.0014	NET= 0.3770 FFC= 0.0135 BMB= 0.3632 OCN= 0.0000 TBS= 0.0003	NET= 0.0169 FFC= 0.0168 BMB= 0.0000 OCN= 0.0000 TBS= 0.0001	NET=-0.0041 FFC= 0.0000 BMB= 0.0000 OCN=-0.0041 TBS= 0.0000	NET=-0.0030 FFC= 0.0000 BMB= 0.0000 OCN=-0.0030 TBS= 0.0000	NET=-0.0015 FFC= 0.0000 BMB= 0.0000 OCN=-0.0015 TBS= 0.0000
17.5	NET= 0.0188 FFC= 0.0060 BMB= 0.0158 OCN=-0.0001 TBS=-0.0029	NET= 0.1108 FFC= 0.0001 BMB= 0.1105 OCN= 0.0000 TBS= 0.0001	NET= 0.1476 FFC= 0.0053 BMB= 0.1421 OCN= 0.0000 TBS= 0.0002	NET= 0.0038 FFC= 0.0041 BMB= 0.0000 OCN=-0.0001 TBS=-0.0002	NET= 0.0627 FFC= 0.0175 BMB= 0.0474 OCN=-0.0022 TBS= 0.0000	NET= 0.0474 FFC= 0.0010 BMB= 0.0474 OCN=-0.0010 TBS= 0.0000
12.5	NET= 0.0048 FFC= 0.0041 BMB= 0.0000 OCN= 0.0036 TBS=-0.0029	NET=-0.0100 FFC= 0.0018 BMB= 0.0000 OCN= 0.0000 TBS=-0.0118	NET= 0.0347 FFC= 0.0009 BMB= 0.0474 OCN=-0.0145 TBS= 0.0009	NET= 0.1565 FFC= 0.0086 BMB= 0.1579 OCN=-0.0119 TBS= 0.0016	NET= 0.3229 FFC= 0.0304 BMB= 0.3000 OCN=-0.0097 TBS= 0.0022	NET= 0.2766 FFC= 0.0133 BMB= 0.2684 OCN=-0.0053 TBS= 0.0002
7.5	NET= 0.0038 FFC= 0.0000 BMB= 0.0000 OCN= 0.0040 TBS=-0.0002	NET=-0.0018 FFC= 0.0020 BMB= 0.0000 OCN= 0.0028 TBS=-0.0065	NET= 0.0146 FFC= 0.0072 BMB= 0.0000 OCN=-0.0002 TBS= 0.0076	NET= 0.0326 FFC= 0.0132 BMB= 0.0000 OCN=-0.0008 TBS= 0.0202	NET= 0.0303 FFC= 0.0146 BMB= 0.0000 OCN=-0.0012 TBS= 0.0169	NET= 0.0171 FFC= 0.0172 BMB= 0.0000 OCN=-0.0005 TBS= 0.0004
2.5	NET= 0.0096 FFC= 0.0000 BMB= 0.0000 OCN= 0.0096 TBS= 0.0000	NET= 0.0054 FFC= 0.0000 BMB= 0.0000 OCN= 0.0056 TBS=-0.0002	NET= 0.0064 FFC= 0.0080 BMB= 0.0000 OCN= 0.0000 TBS=-0.0016	NET= 0.0316 FFC= 0.0145 BMB= 0.0000 OCN= 0.0000 TBS= 0.0170	NET= 0.0011 FFC= 0.0089 BMB= 0.0000 OCN= 0.0000 TBS=-0.0079	NET=-0.0029 FFC= 0.0034 BMB= 0.0000 OCN= 0.0000 TBS=-0.0063
-2.5	NET= 0.0028 FFC= 0.0000 BMB= 0.0000 OCN= 0.0028 TBS= 0.0000	NET= 0.0022 FFC= 0.0018 BMB= 0.0000 OCN= 0.0004 TBS= 0.0000	NET=-0.0019 FFC= 0.0096 BMB= 0.0000 OCN= 0.0000 TBS=-0.0115	NET=-0.0115 FFC= 0.0024 BMB= 0.0000 OCN= 0.0000 TBS=-0.0138	NET=-0.0125 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS=-0.0131	NET=-0.0085 FFC= 0.0009 BMB= 0.0000 OCN= 0.0000 TBS=-0.0094
-7.5	NET= 0.0090 FFC= 0.0000 BMB= 0.0000 OCN= 0.0090 TBS= 0.0000	NET= 0.0140 FFC= 0.0006 BMB= 0.0000 OCN= 0.0134 TBS= 0.0000	NET=-0.0060 FFC= 0.0042 BMB= 0.0000 OCN= 0.0000 TBS=-0.0081	NET=-0.0194 FFC= 0.0005 BMB= 0.0000 OCN= 0.0000 TBS=-0.0200	NET=-0.0137 FFC= 0.0003 BMB= 0.0000 OCN= 0.0000 TBS=-0.0139	NET=-0.0102 FFC= 0.0005 BMB= 0.0000 OCN= 0.0000 TBS=-0.0107
-12.5	NET=-0.0017 FFC= 0.0000 BMB= 0.0000 OCN=-0.0017 TBS= 0.0000	NET=-0.0022 FFC= 0.0000 BMB= 0.0000 OCN=-0.0022 TBS= 0.0000	NET= 0.0050 FFC= 0.0070 BMB= 0.0000 OCN=-0.0008 TBS=-0.0012	NET=-0.0098 FFC= 0.0022 BMB= 0.0000 OCN= 0.0000 TBS=-0.0120	NET=-0.0094 FFC= 0.0012 BMB= 0.0000 OCN= 0.0000 TBS=-0.0105	NET=-0.0214 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS=-0.0220
-17.5	NET=-0.0014 FFC= 0.0000 BMB= 0.0000 OCN=-0.0014 TBS= 0.0000	NET=-0.0017 FFC= 0.0000 BMB= 0.0000 OCN=-0.0017 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0022 FFC= 0.0026 BMB= 0.0000 OCN= 0.0000 TBS=-0.0048	NET=-0.0064 FFC= 0.0021 BMB= 0.0000 OCN= 0.0000 TBS=-0.0085	NET=-0.0256 FFC= 0.0008 BMB= 0.0000 OCN= 0.0000 TBS=-0.0264
-22.5	NET=-0.0009 FFC= 0.0000 BMB= 0.0000 OCN=-0.0009 TBS= 0.0000	NET=-0.0007 FFC= 0.0000 BMB= 0.0000 OCN=-0.0007 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET= 0.0007 FFC= 0.0010 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET= 0.0094 FFC= 0.0047 BMB= 0.0000 OCN= 0.0000 TBS= 0.0047	NET=-0.0165 FFC= 0.0027 BMB= 0.0000 OCN= 0.0000 TBS=-0.0193
-27.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0007 FFC= 0.0000 BMB= 0.0000 OCN=-0.0007 TBS= 0.0000	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET= 0.0006 FFC= 0.0010 BMB= 0.0000 OCN=-0.0008 TBS= 0.0000	NET= 0.0008 FFC= 0.0066 BMB= 0.0000 OCN= 0.0000 TBS=-0.0057	NET=-0.0081 FFC= 0.0063 BMB= 0.0000 OCN= 0.0000 TBS=-0.0144

Figure 10.18 Monthly Average Fluxes for March
(-117.5, -62.5)x(32.5, 87.5) (longitude)x(latitude)

	−117.5	−112.5	−107.5	−102.5	−97.5	−92.5	−87.5	−82.5	−77.5	−72.5	−67.5	−62.5
87.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
82.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
77.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
72.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
67.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
62.5	NET= 0.0003 FFC= 0.0003 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0006 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0001 FFC= 0.0001 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
57.5	NET= 0.0096 FFC= 0.0064 BMB= 0.0000 OCN= 0.0000 TBS= 0.0032	NET= 0.0054 FFC= 0.0047 BMB= 0.0000 OCN= 0.0000 TBS= 0.0007	NET= 0.0028 FFC= 0.0015 BMB= 0.0000 OCN= 0.0000 TBS= 0.0012	NET= 0.0015 FFC= 0.0015 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0016 FFC= 0.0016 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0006 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
52.5	NET= 0.0218 FFC= 0.0060 BMB= 0.0000 OCN= 0.0000 TBS= 0.0158	NET= 0.0451 FFC= 0.0388 BMB= 0.0000 OCN= 0.0000 TBS= 0.0063	NET= 0.0182 FFC= 0.0109 BMB= 0.0000 OCN= 0.0000 TBS= 0.0073	NET= 0.0148 FFC= 0.0082 BMB= 0.0000 OCN= 0.0000 TBS= 0.0067	NET= 0.0074 FFC= 0.0035 BMB= 0.0000 OCN= 0.0000 TBS= 0.0039	NET= 0.0046 FFC= 0.0043 BMB= 0.0000 OCN= 0.0000 TBS= 0.0003	NET= 0.0016 FFC= 0.0013 BMB= 0.0000 OCN= 0.0000 TBS= 0.0003	NET= 0.0007 FFC= 0.0005 BMB= 0.0000 OCN= 0.0000 TBS= 0.0002	NET= 0.0046 FFC= 0.0044 BMB= 0.0000 OCN= 0.0000 TBS= 0.0002	NET= 0.0009 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS= 0.0003	NET= 0.0065 FFC= 0.0062 BMB= 0.0000 OCN= 0.0000 TBS= 0.0003	NET= 0.0039 FFC= 0.0036 BMB= 0.0000 OCN= 0.0000 TBS= 0.0003
47.5	NET= 0.0468 FFC= 0.0273 BMB= 0.0000 OCN= 0.0000 TBS= 0.0196	NET= 0.0325 FFC= 0.0152 BMB= 0.0000 OCN= 0.0000 TBS= 0.0174	NET= 0.0131 FFC= 0.0142 BMB= 0.0000 OCN= 0.0000 TBS= 0.0008	NET= 0.0344 FFC= 0.0325 BMB= 0.0000 OCN= 0.0000 TBS= 0.0019	NET= 0.0580 FFC= 0.0505 BMB= 0.0000 OCN= 0.0000 TBS= 0.0075	NET= 0.0511 FFC= 0.0401 BMB= 0.0000 OCN= 0.0000 TBS= 0.0110	NET= 0.0468 FFC= 0.0377 BMB= 0.0000 OCN= 0.0000 TBS= 0.0092	NET= 0.0258 FFC= 0.0185 BMB= 0.0000 OCN= 0.0000 TBS= 0.0074	NET= 0.0360 FFC= 0.0282 BMB= 0.0000 OCN= 0.0000 TBS= 0.0078	NET= 0.1122 FFC= 0.1026 BMB= 0.0000 OCN= 0.0000 TBS= 0.0096	NET= 0.0413 FFC= 0.0314 BMB= 0.0000 OCN= 0.0000 TBS= 0.0099	NET= 0.0232 FFC= 0.0120 BMB= 0.0000 OCN= 0.0000 TBS= 0.0112
42.5	NET= 0.0238 FFC= 0.0078 BMB= 0.0000 OCN= 0.0000 TBS= 0.0160	NET= 0.0628 FFC= 0.0436 BMB= 0.0000 OCN= 0.0000 TBS= 0.0192	NET= 0.0490 FFC= 0.0461 BMB= 0.0000 OCN= 0.0000 TBS= 0.0029	NET= 0.0247 FFC= 0.0252 BMB= 0.0000 OCN= 0.0000 TBS=−0.0006	NET= 0.0538 FFC= 0.0525 BMB= 0.0000 OCN= 0.0000 TBS= 0.0012	NET= 0.1324 FFC= 0.1210 BMB= 0.0000 OCN= 0.0000 TBS= 0.0114	NET= 0.3553 FFC= 0.3458 BMB= 0.0000 OCN= 0.0000 TBS= 0.0096	NET= 0.3180 FFC= 0.3071 BMB= 0.0000 OCN= 0.0000 TBS= 0.0108	NET= 0.4562 FFC= 0.4437 BMB= 0.0000 OCN= 0.0000 TBS= 0.0126	NET= 0.4160 FFC= 0.4002 BMB= 0.0000 OCN= 0.0000 TBS= 0.0158	NET= 0.0138 FFC= 0.0054 BMB= 0.0000 OCN= 0.0000 TBS= 0.0084	NET=−0.0039 FFC= 0.0068 BMB= 0.0000 OCN=−0.0202 TBS= 0.0095
37.5	NET= 0.0601 FFC= 0.0450 BMB= 0.0000 OCN= 0.0000 TBS= 0.0152	NET= 0.0186 FFC= 0.0113 BMB= 0.0000 OCN= 0.0000 TBS= 0.0072	NET= 0.0438 FFC= 0.0322 BMB= 0.0000 OCN= 0.0000 TBS= 0.0115	NET= 0.0608 FFC= 0.0528 BMB= 0.0000 OCN= 0.0000 TBS= 0.0080	NET= 0.1282 FFC= 0.1262 BMB= 0.0000 OCN= 0.0000 TBS= 0.0021	NET= 0.1488 FFC= 0.1400 BMB= 0.0000 OCN= 0.0000 TBS= 0.0088	NET= 0.3284 FFC= 0.3109 BMB= 0.0000 OCN= 0.0000 TBS= 0.0175	NET= 0.3408 FFC= 0.3180 BMB= 0.0000 OCN= 0.0000 TBS= 0.0228	NET= 0.2963 FFC= 0.2738 BMB= 0.0000 OCN= 0.0000 TBS= 0.0224	NET= 0.0427 FFC= 0.0311 BMB= 0.0000 OCN= 0.0000 TBS= 0.0116	NET=−0.0144 FFC= 0.0000 BMB= 0.0000 OCN=−0.0146 TBS= 0.0002	NET=−0.0533 FFC= 0.0000 BMB= 0.0000 OCN=−0.0535 TBS= 0.0002
32.5	NET= 0.1876 FFC= 0.1896 BMB= 0.0000 OCN= 0.0000 TBS=−0.0020	NET= 0.0627 FFC= 0.0675 BMB= 0.0000 OCN= 0.0000 TBS=−0.0048	NET= 0.0324 FFC= 0.0256 BMB= 0.0000 OCN= 0.0000 TBS= 0.0069	NET= 0.0678 FFC= 0.0647 BMB= 0.0000 OCN= 0.0000 TBS= 0.0031	NET= 0.2218 FFC= 0.2228 BMB= 0.0000 OCN= 0.0000 TBS=−0.0010	NET= 0.1846 FFC= 0.1688 BMB= 0.0000 OCN= 0.0000 TBS= 0.0157	NET= 0.1822 FFC= 0.1549 BMB= 0.0000 OCN= 0.0000 TBS= 0.0273	NET= 0.2114 FFC= 0.1883 BMB= 0.0000 OCN= 0.0000 TBS= 0.0231	NET= 0.0431 FFC= 0.0236 BMB= 0.0000 OCN= 0.0000 TBS= 0.0195	NET=−0.0006 FFC= 0.0000 BMB= 0.0000 OCN=−0.0006 TBS= 0.0000	NET=−0.0036 FFC= 0.0006 BMB= 0.0000 OCN=−0.0040 TBS= 0.0000	NET=−0.0064 FFC= 0.0000 BMB= 0.0000 OCN=−0.0064 TBS= 0.0000

Figure 10.19 Monthly Average Fluxes for March
(-57.5, -2.5)x(-87.5, -32.5) (longitude)x(latitude)

	-57.5	-52.5	-47.5	-42.5	-37.5	-32.5	-27.5	-22.5	-17.5	-12.5	-7.5	-2.5
-32.5	NET= 0.0235 FFC= 0.0430 BMB= 0.0000 OCN= 0.0000 TBS=-0.0196	NET=-0.0164 FFC= 0.0052 BMB= 0.0000 OCN= 0.0000 TBS=-0.0216	NET=-0.0014 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS=-0.0015	NET= 0.0004 FFC= 0.0000 BMB= 0.0000 OCN= 0.0004 TBS= 0.0000	NET= 0.0003 FFC= 0.0000 BMB= 0.0000 OCN= 0.0003 TBS= 0.0000	NET= 0.0004 FFC= 0.0000 BMB= 0.0000 OCN= 0.0004 TBS= 0.0000	NET= 0.0003 FFC= 0.0000 BMB= 0.0000 OCN= 0.0003 TBS= 0.0000	NET= 0.0006 FFC= 0.0000 BMB= 0.0000 OCN= 0.0006 TBS= 0.0000	NET= 0.0011 FFC= 0.0000 BMB= 0.0000 OCN= 0.0011 TBS= 0.0000	NET= 0.0006 FFC= 0.0000 BMB= 0.0000 OCN= 0.0006 TBS= 0.0000	NET= 0.0008 FFC= 0.0000 BMB= 0.0000 OCN= 0.0008 TBS= 0.0000	NET= 0.0009 FFC= 0.0000 BMB= 0.0000 OCN= 0.0009 TBS= 0.0000
-37.5	NET= 0.0038 FFC= 0.0037 BMB= 0.0000 OCN= 0.0000 TBS= 0.0001	NET=-0.0028 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS=-0.0028	NET= 0.0001 FFC= 0.0000 BMB= 0.0000 OCN= 0.0001 TBS= 0.0000	NET= 0.0001 FFC= 0.0000 BMB= 0.0000 OCN= 0.0001 TBS= 0.0000	NET= 0.0005 FFC= 0.0000 BMB= 0.0000 OCN= 0.0005 TBS= 0.0000	NET= 0.0004 FFC= 0.0000 BMB= 0.0000 OCN= 0.0004 TBS= 0.0000	NET= 0.0001 FFC= 0.0000 BMB= 0.0000 OCN= 0.0001 TBS= 0.0000	NET= 0.0001 FFC= 0.0000 BMB= 0.0000 OCN= 0.0001 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0003 FFC= 0.0000 BMB= 0.0000 OCN= 0.0003 TBS= 0.0000	NET= 0.0002 FFC= 0.0000 BMB= 0.0000 OCN= 0.0002 TBS= 0.0000	NET= 0.0001 FFC= 0.0000 BMB= 0.0000 OCN= 0.0001 TBS= 0.0000
-42.5	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0018 TBS= 0.0016	NET=-0.0068 FFC= 0.0000 BMB= 0.0000 OCN=-0.0068 TBS= 0.0000	NET=-0.0134 FFC= 0.0000 BMB= 0.0000 OCN=-0.0134 TBS= 0.0000	NET=-0.0114 FFC= 0.0000 BMB= 0.0000 OCN=-0.0114 TBS= 0.0000	NET=-0.0036 FFC= 0.0000 BMB= 0.0000 OCN=-0.0036 TBS= 0.0000	NET=-0.0014 FFC= 0.0000 BMB= 0.0000 OCN=-0.0014 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0012 FFC= 0.0000 BMB= 0.0000 OCN=-0.0012 TBS= 0.0000	NET=-0.0093 FFC= 0.0000 BMB= 0.0000 OCN=-0.0093 TBS= 0.0000	NET=-0.0110 FFC= 0.0000 BMB= 0.0000 OCN=-0.0110 TBS= 0.0000	NET=-0.0243 FFC= 0.0000 BMB= 0.0000 OCN=-0.0243 TBS= 0.0000	NET=-0.0296 FFC= 0.0000 BMB= 0.0000 OCN=-0.0296 TBS= 0.0000
-47.5	NET=-0.0216 FFC= 0.0000 BMB= 0.0000 OCN=-0.0214 TBS=-0.0002	NET=-0.0082 FFC= 0.0000 BMB= 0.0000 OCN=-0.0082 TBS= 0.0000	NET=-0.0412 FFC= 0.0000 BMB= 0.0000 OCN=-0.0412 TBS= 0.0000	NET=-0.0248 FFC= 0.0000 BMB= 0.0000 OCN=-0.0248 TBS= 0.0000	NET=-0.0112 FFC= 0.0000 BMB= 0.0000 OCN=-0.0112 TBS= 0.0000	NET=-0.0179 FFC= 0.0000 BMB= 0.0000 OCN=-0.0179 TBS= 0.0000	NET=-0.0239 FFC= 0.0000 BMB= 0.0000 OCN=-0.0239 TBS= 0.0000	NET=-0.0138 FFC= 0.0000 BMB= 0.0000 OCN=-0.0138 TBS= 0.0000	NET=-0.0143 FFC= 0.0000 BMB= 0.0000 OCN=-0.0143 TBS= 0.0000	NET=-0.0532 FFC= 0.0000 BMB= 0.0000 OCN=-0.0532 TBS= 0.0000	NET=-0.0808 FFC= 0.0000 BMB= 0.0000 OCN=-0.0808 TBS= 0.0000	NET=-0.0170 FFC= 0.0000 BMB= 0.0000 OCN=-0.0170 TBS= 0.0000
-52.5	NET=-0.0009 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS=-0.0005	NET=-0.0028 FFC= 0.0000 BMB= 0.0000 OCN=-0.0028 TBS= 0.0000	NET=-0.0042 FFC= 0.0000 BMB= 0.0000 OCN=-0.0042 TBS= 0.0000	NET=-0.0007 FFC= 0.0000 BMB= 0.0000 OCN=-0.0007 TBS= 0.0000	NET=-0.0009 FFC= 0.0000 BMB= 0.0000 OCN=-0.0009 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0204 FFC= 0.0000 BMB= 0.0000 OCN=-0.0204 TBS= 0.0000	NET=-0.0028 FFC= 0.0000 BMB= 0.0000 OCN=-0.0028 TBS= 0.0000	NET=-0.0067 FFC= 0.0000 BMB= 0.0000 OCN=-0.0067 TBS= 0.0000	NET=-0.0214 FFC= 0.0000 BMB= 0.0000 OCN=-0.0214 TBS= 0.0000	NET=-0.0286 FFC= 0.0000 BMB= 0.0000 OCN=-0.0286 TBS= 0.0000	NET=-0.0206 FFC= 0.0000 BMB= 0.0000 OCN=-0.0206 TBS= 0.0000
-57.5	NET=-0.0010 FFC= 0.0000 BMB= 0.0000 OCN=-0.0010 TBS= 0.0000	NET=-0.0014 FFC= 0.0000 BMB= 0.0000 OCN=-0.0014 TBS= 0.0000	NET=-0.0008 FFC= 0.0000 BMB= 0.0000 OCN=-0.0008 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0007 FFC= 0.0000 BMB= 0.0000 OCN=-0.0007 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0011 FFC= 0.0000 BMB= 0.0000 OCN=-0.0011 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0007 FFC= 0.0000 BMB= 0.0000 OCN=-0.0007 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000
-62.5	NET=-0.0008 FFC= 0.0000 BMB= 0.0000 OCN=-0.0000 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0005 TBS= 0.0000	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-67.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-72.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-77.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-82.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-87.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000

Figure 10.20 Monthly Average Fluxes for March
(-57.5, -2.5)x(-27.5, 27.5) (longitude)x(latitude)

	-57.5	-52.5	-47.5	-42.5	-37.5	-32.5	-27.5	-22.5	-17.5	-12.5	-7.5	-2.5
27.5	NET=-0.0007 FFC=0.0000 BMB=0.0000 OCN=-0.0007 TBS=0.0000	NET=-0.0018 FFC=0.0000 BMB=0.0000 OCN=-0.0018 TBS=0.0000	NET=0.0000 FFC=0.0000 BMB=0.0000 OCN=0.0000 TBS=0.0000	NET=-0.0001 FFC=0.0000 BMB=0.0000 OCN=-0.0001 TBS=0.0000	NET=-0.0007 FFC=0.0000 BMB=0.0000 OCN=-0.0007 TBS=0.0000	NET=-0.0002 FFC=0.0000 BMB=0.0000 OCN=-0.0002 TBS=0.0000	NET=-0.0021 FFC=0.0000 BMB=0.0000 OCN=-0.0021 TBS=0.0000	NET=-0.0051 FFC=0.0000 BMB=0.0000 OCN=-0.0051 TBS=0.0000	NET=0.0004 FFC=0.0015 BMB=0.0000 OCN=-0.0012 TBS=0.0000	NET=-0.0016 FFC=0.0004 BMB=0.0000 OCN=-0.0020 TBS=0.0000	NET=-0.0037 FFC=0.0014 BMB=0.0000 OCN=0.0000 TBS=-0.0051	NET=-0.0088 FFC=0.0020 BMB=0.0000 OCN=0.0000 TBS=-0.0108
22.5	NET=-0.0058 FFC=0.0000 BMB=0.0000 OCN=-0.0058 TBS=0.0000	NET=-0.0019 FFC=0.0000 BMB=0.0000 OCN=-0.0019 TBS=0.0000	NET=-0.0027 FFC=0.0000 BMB=0.0000 OCN=-0.0027 TBS=0.0000	NET=-0.0073 FFC=0.0000 BMB=0.0000 OCN=-0.0073 TBS=0.0000	NET=-0.0043 FFC=0.0000 BMB=0.0000 OCN=-0.0043 TBS=0.0000	NET=-0.0047 FFC=0.0000 BMB=0.0000 OCN=-0.0047 TBS=0.0000	NET=-0.0006 FFC=0.0000 BMB=0.0000 OCN=-0.0006 TBS=0.0000	NET=-0.0027 FFC=0.0000 BMB=0.0000 OCN=-0.0027 TBS=0.0000	NET=-0.0057 FFC=0.0002 BMB=0.0000 OCN=-0.0059 TBS=0.0000	NET=0.0004 FFC=0.0007 BMB=0.0000 OCN=-0.0002 TBS=0.0000	NET=0.8783 FFC=0.0003 BMB=0.8842 OCN=0.0000 TBS=-0.0062	NET=0.0153 FFC=0.0011 BMB=0.0156 OCN=0.0000 TBS=-0.0015
17.5	NET=0.0148 FFC=0.0000 BMB=0.0156 OCN=-0.0008 TBS=0.0000	NET=-0.0048 FFC=0.0000 BMB=0.0000 OCN=-0.0048 TBS=0.0000	NET=-0.0041 FFC=0.0000 BMB=0.0000 OCN=-0.0041 TBS=0.0000	NET=-0.0075 FFC=0.0000 BMB=0.0000 OCN=-0.0075 TBS=0.0000	NET=-0.0003 FFC=0.0000 BMB=0.0000 OCN=-0.0003 TBS=0.0000	NET=-0.0112 FFC=0.0000 BMB=0.0000 OCN=-0.0112 TBS=0.0000	NET=-0.0186 FFC=0.0000 BMB=0.0000 OCN=-0.0186 TBS=0.0000	NET=-0.0191 FFC=0.0000 BMB=0.0000 OCN=-0.0191 TBS=0.0000	NET=-0.0018 FFC=0.0007 BMB=0.0000 OCN=-0.0025 TBS=0.0000	NET=0.1337 FFC=0.0011 BMB=0.1263 OCN=0.0000 TBS=0.0062	NET=0.4732 FFC=0.0007 BMB=0.4737 OCN=0.0000 TBS=-0.0013	NET=0.2354 FFC=0.0001 BMB=0.2368 OCN=0.0000 TBS=-0.0015
12.5	NET=0.2180 FFC=0.0009 BMB=0.2211 OCN=-0.0037 TBS=-0.0002	NET=-0.0047 FFC=0.0000 BMB=0.0000 OCN=-0.0047 TBS=0.0000	NET=-0.0060 FFC=0.0000 BMB=0.0000 OCN=-0.0060 TBS=0.0000	NET=-0.0138 FFC=0.0000 BMB=0.0000 OCN=-0.0138 TBS=0.0000	NET=-0.0014 FFC=0.0000 BMB=0.0000 OCN=-0.0014 TBS=0.0000	NET=-0.0171 FFC=0.0000 BMB=0.0000 OCN=-0.0171 TBS=0.0000	NET=-0.0211 FFC=0.0000 BMB=0.0000 OCN=-0.0211 TBS=0.0000	NET=-0.0108 FFC=0.0000 BMB=0.0000 OCN=-0.0108 TBS=0.0000	NET=-0.0156 FFC=0.0009 BMB=0.0000 OCN=-0.0165 TBS=0.0000	NET=0.0205 FFC=0.0012 BMB=0.0000 OCN=0.0000 TBS=0.0193	NET=0.3923 FFC=0.0004 BMB=0.3789 OCN=0.0000 TBS=0.0129	NET=1.4156 FFC=0.0007 BMB=1.4063 OCN=0.0000 TBS=0.0086
7.5	NET=0.2333 FFC=0.0005 BMB=0.2368 OCN=-0.0007 TBS=-0.0034	NET=0.0109 FFC=0.0001 BMB=0.0000 OCN=0.0115 TBS=-0.0007	NET=0.0186 FFC=0.0000 BMB=0.0000 OCN=0.0186 TBS=0.0000	NET=0.0215 FFC=0.0000 BMB=0.0000 OCN=0.0215 TBS=0.0000	NET=0.0134 FFC=0.0000 BMB=0.0000 OCN=0.0134 TBS=0.0000	NET=0.0022 FFC=0.0000 BMB=0.0000 OCN=0.0022 TBS=0.0000	NET=0.0096 FFC=0.0000 BMB=0.0000 OCN=0.0096 TBS=0.0000	NET=0.0158 FFC=0.0000 BMB=0.0000 OCN=0.0158 TBS=0.0000	NET=0.0040 FFC=0.0000 BMB=0.0000 OCN=0.0040 TBS=0.0000	NET=0.0098 FFC=0.0009 BMB=0.0000 OCN=0.0000 TBS=0.0089	NET=0.0269 FFC=0.0027 BMB=0.0000 OCN=0.0000 TBS=0.0242	NET=0.0964 FFC=0.0039 BMB=0.0632 OCN=0.0000 TBS=0.0293
2.5	NET=-0.0126 FFC=0.0012 BMB=0.0000 OCN=0.0000 TBS=-0.0138	NET=-0.0044 FFC=0.0000 BMB=0.0000 OCN=0.0001 TBS=-0.0045	NET=0.0004 FFC=0.0000 BMB=0.0000 OCN=0.0004 TBS=0.0000	NET=0.0089 FFC=0.0000 BMB=0.0000 OCN=0.0089 TBS=0.0000	NET=0.0137 FFC=0.0000 BMB=0.0000 OCN=0.0137 TBS=0.0000	NET=0.0143 FFC=0.0000 BMB=0.0000 OCN=0.0143 TBS=0.0000	NET=0.0073 FFC=0.0000 BMB=0.0000 OCN=0.0073 TBS=0.0000	NET=0.0027 FFC=0.0000 BMB=0.0000 OCN=0.0027 TBS=0.0000	NET=0.0012 FFC=0.0000 BMB=0.0000 OCN=0.0012 TBS=0.0000	NET=0.0020 FFC=0.0000 BMB=0.0000 OCN=0.0016 TBS=0.0004	NET=0.0128 FFC=0.0000 BMB=0.0000 OCN=0.0018 TBS=0.0110	NET=0.0244 FFC=0.0000 BMB=0.0000 OCN=0.0013 TBS=0.0231
-2.5	NET=-0.0144 FFC=0.0007 BMB=0.0000 OCN=0.0000 TBS=-0.0151	NET=-0.0218 FFC=0.0010 BMB=0.0000 OCN=0.0000 TBS=-0.0228	NET=-0.0087 FFC=0.0034 BMB=0.0000 OCN=0.0000 TBS=-0.0121	NET=-0.0169 FFC=0.0030 BMB=0.0000 OCN=0.0005 TBS=-0.0204	NET=0.0000 FFC=0.0032 BMB=0.0000 OCN=0.0014 TBS=-0.0047	NET=0.0025 FFC=0.0000 BMB=0.0000 OCN=0.0025 TBS=0.0000	NET=0.0030 FFC=0.0000 BMB=0.0000 OCN=0.0030 TBS=0.0000	NET=0.0006 FFC=0.0000 BMB=0.0000 OCN=0.0006 TBS=0.0000	NET=0.0011 FFC=0.0000 BMB=0.0000 OCN=0.0011 TBS=0.0000	NET=0.0004 FFC=0.0000 BMB=0.0000 OCN=0.0004 TBS=0.0000	NET=0.0028 FFC=0.0000 BMB=0.0000 OCN=0.0028 TBS=0.0000	NET=0.0008 FFC=0.0000 BMB=0.0000 OCN=0.0008 TBS=0.0000
-7.5	NET=-0.0077 FFC=0.0003 BMB=0.0000 OCN=0.0000 TBS=-0.0080	NET=-0.0203 FFC=0.0003 BMB=0.0000 OCN=0.0000 TBS=-0.0206	NET=-0.0217 FFC=0.0031 BMB=0.0000 OCN=0.0000 TBS=-0.0248	NET=-0.0254 FFC=0.0055 BMB=0.0000 OCN=0.0000 TBS=-0.0309	NET=-0.0069 FFC=0.0158 BMB=0.0000 OCN=0.0000 TBS=-0.0227	NET=0.0036 FFC=0.0033 BMB=0.0000 OCN=0.0003 TBS=0.0000	NET=0.0010 FFC=0.0000 BMB=0.0000 OCN=0.0010 TBS=0.0000	NET=0.0003 FFC=0.0000 BMB=0.0000 OCN=0.0003 TBS=0.0000	NET=0.0003 FFC=0.0000 BMB=0.0000 OCN=0.0003 TBS=0.0000	NET=0.0023 FFC=0.0000 BMB=0.0000 OCN=0.0023 TBS=0.0000	NET=0.0030 FFC=0.0000 BMB=0.0000 OCN=0.0030 TBS=0.0000	NET=0.0048 FFC=0.0000 BMB=0.0000 OCN=0.0048 TBS=0.0000
-12.5	NET=-0.0118 FFC=0.0003 BMB=0.0000 OCN=0.0000 TBS=-0.0121	NET=-0.0141 FFC=0.0001 BMB=0.0000 OCN=0.0000 TBS=-0.0141	NET=-0.0153 FFC=0.0031 BMB=0.0000 OCN=0.0000 TBS=-0.0186	NET=-0.0138 FFC=0.0059 BMB=0.0000 OCN=0.0000 TBS=-0.0197	NET=-0.0061 FFC=0.0060 BMB=0.0000 OCN=0.0000 TBS=-0.0121	NET=0.0000 FFC=0.0000 BMB=0.0000 OCN=0.0000 TBS=0.0000	NET=0.0008 FFC=0.0000 BMB=0.0000 OCN=0.0008 TBS=0.0000	NET=0.0019 FFC=0.0000 BMB=0.0000 OCN=0.0019 TBS=0.0000	NET=0.0027 FFC=0.0000 BMB=0.0000 OCN=0.0027 TBS=0.0000	NET=0.0014 FFC=0.0000 BMB=0.0000 OCN=0.0014 TBS=0.0000	NET=0.0040 FFC=0.0000 BMB=0.0000 OCN=0.0040 TBS=0.0000	NET=0.0001 FFC=0.0000 BMB=0.0000 OCN=0.0001 TBS=0.0000
-17.5	NET=-0.0169 FFC=0.0013 BMB=0.0000 OCN=0.0000 TBS=-0.0182	NET=-0.0215 FFC=0.0022 BMB=0.0000 OCN=0.0000 TBS=-0.0237	NET=-0.0248 FFC=0.0077 BMB=0.0000 OCN=0.0000 TBS=-0.0325	NET=-0.0068 FFC=0.0117 BMB=0.0000 OCN=0.0000 TBS=-0.0185	NET=-0.0123 FFC=0.0007 BMB=0.0000 OCN=0.0000 TBS=-0.0130	NET=0.0011 FFC=0.0000 BMB=0.0000 OCN=0.0011 TBS=0.0000	NET=0.0007 FFC=0.0000 BMB=0.0000 OCN=0.0007 TBS=0.0000	NET=0.0017 FFC=0.0000 BMB=0.0000 OCN=0.0017 TBS=0.0000	NET=0.0016 FFC=0.0000 BMB=0.0000 OCN=0.0016 TBS=0.0000	NET=0.0000 FFC=0.0000 BMB=0.0000 OCN=0.0000 TBS=0.0000	NET=0.0025 FFC=0.0000 BMB=0.0000 OCN=0.0025 TBS=0.0000	NET=0.0032 FFC=0.0000 BMB=0.0000 OCN=0.0032 TBS=0.0000
-22.5	NET=-0.0126 FFC=0.0012 BMB=0.0000 OCN=0.0000 TBS=-0.0138	NET=-0.0176 FFC=0.0098 BMB=0.0000 OCN=0.0000 TBS=-0.0274	NET=0.3826 FFC=0.0336 BMB=0.3947 OCN=0.0000 TBS=-0.0457	NET=-0.0061 FFC=0.0210 BMB=0.0000 OCN=0.0000 TBS=-0.0271	NET=-0.0046 FFC=0.0000 BMB=0.0000 OCN=0.0002 TBS=-0.0048	NET=0.0001 FFC=0.0000 BMB=0.0000 OCN=0.0001 TBS=0.0000	NET=0.0016 FFC=0.0000 BMB=0.0000 OCN=0.0016 TBS=0.0000	NET=0.0011 FFC=0.0000 BMB=0.0000 OCN=0.0011 TBS=0.0000	NET=0.0001 FFC=0.0000 BMB=0.0000 OCN=0.0001 TBS=0.0000	NET=0.0008 FFC=0.0000 BMB=0.0000 OCN=0.0008 TBS=0.0000	NET=0.0008 FFC=0.0000 BMB=0.0000 OCN=0.0008 TBS=0.0000	NET=0.0008 FFC=0.0000 BMB=0.0000 OCN=0.0008 TBS=0.0000
-27.5	NET=-0.0090 FFC=0.0067 BMB=0.0000 OCN=0.0000 TBS=-0.0157	NET=-0.0168 FFC=0.0120 BMB=0.0000 OCN=0.0000 TBS=-0.0288	NET=-0.0254 FFC=0.0066 BMB=0.0000 OCN=0.0000 TBS=-0.0320	NET=-0.0042 FFC=0.0000 BMB=0.0000 OCN=0.0003 TBS=-0.0045	NET=0.0006 FFC=0.0000 BMB=0.0000 OCN=0.0006 TBS=0.0000	NET=0.0011 FFC=0.0000 BMB=0.0000 OCN=0.0011 TBS=0.0000	NET=0.0018 FFC=0.0000 BMB=0.0000 OCN=0.0018 TBS=0.0000	NET=0.0020 FFC=0.0000 BMB=0.0000 OCN=0.0020 TBS=0.0000	NET=0.0006 FFC=0.0000 BMB=0.0000 OCN=0.0006 TBS=0.0000	NET=0.0015 FFC=0.0000 BMB=0.0000 OCN=0.0015 TBS=0.0000	NET=0.0018 FFC=0.0000 BMB=0.0000 OCN=0.0018 TBS=0.0000	NET=0.0012 FFC=0.0000 BMB=0.0000 OCN=0.0012 TBS=0.0000

Figure 10.21 Monthly Average Fluxes for March
(-57.5, -2.5)x(32.5, 87.5) (longitude)x(latitude)

	-57.5	-52.5	-47.5	-42.5	-37.5	-32.5	-27.5	-22.5	-17.5	-12.5	-7.5	-2.5
87.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
82.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
77.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
72.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
67.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0001 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0001	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0010 FFC= 0.0010 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0016 FFC= 0.0013 BMB= 0.0000 OCN= 0.0000 TBS= 0.0002	NET= 0.0006 FFC= 0.0005 BMB= 0.0000 OCN= 0.0000 TBS= 0.0001	NET=-0.0023 FFC= 0.0000 BMB= 0.0000 OCN=-0.0023 TBS= 0.0000	NET=-0.0012 FFC= 0.0000 BMB= 0.0000 OCN=-0.0012 TBS= 0.0000
62.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0026 FFC= 0.0000 BMB= 0.0000 OCN=-0.0030 TBS= 0.0004	NET= 0.0004 FFC= 0.0004 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0002 FFC= 0.0002 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0032 FFC= 0.0000 BMB= 0.0000 OCN=-0.0032 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000	NET= 0.0002 FFC= 0.0003 BMB= 0.0000 OCN=-0.0002 TBS= 0.0001	NET= 0.0033 FFC= 0.0007 BMB= 0.0000 OCN= 0.0000 TBS= 0.0027	NET=-0.0033 FFC= 0.0000 BMB= 0.0000 OCN=-0.0046 TBS= 0.0013	NET=-0.0102 FFC= 0.0010 BMB= 0.0000 OCN=-0.0112 TBS= 0.0000	NET=-0.0076 FFC= 0.0000 BMB= 0.0000 OCN=-0.0076 TBS= 0.0000
57.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0124 FFC= 0.0000 BMB= 0.0000 OCN=-0.0124 TBS= 0.0000	NET=-0.0073 FFC= 0.0000 BMB= 0.0000 OCN=-0.0073 TBS= 0.0000	NET=-0.0136 FFC= 0.0000 BMB= 0.0000 OCN=-0.0136 TBS= 0.0000	NET=-0.0326 FFC= 0.0000 BMB= 0.0000 OCN=-0.0326 TBS= 0.0000	NET=-0.0321 FFC= 0.0000 BMB= 0.0000 OCN=-0.0321 TBS= 0.0000	NET=-0.0402 FFC= 0.0000 BMB= 0.0000 OCN=-0.0402 TBS= 0.0000	NET=-0.0202 FFC= 0.0000 BMB= 0.0000 OCN=-0.0202 TBS= 0.0000	NET=-0.0014 FFC= 0.0000 BMB= 0.0000 OCN=-0.0020 TBS= 0.0006	NET=-0.0981 FFC= 0.0000 BMB= 0.0000 OCN=-0.0981 TBS= 0.0001	NET=-0.0384 FFC= 0.0401 BMB= 0.0000 OCN=-0.0786 TBS= 0.0000	NET= 0.2313 FFC= 0.2397 BMB= 0.0000 OCN=-0.0140 TBS= 0.0067
52.5	NET= 0.0072 FFC= 0.0020 BMB= 0.0000 OCN= 0.0000 TBS= 0.0052	NET=-0.0202 FFC= 0.0000 BMB= 0.0000 OCN=-0.0204 TBS= 0.0002	NET=-0.0091 FFC= 0.0000 BMB= 0.0000 OCN=-0.0091 TBS= 0.0000	NET=-0.0649 FFC= 0.0000 BMB= 0.0000 OCN=-0.0648 TBS= 0.0000	NET=-0.1363 FFC= 0.0000 BMB= 0.0000 OCN=-0.1363 TBS= 0.0000	NET=-0.1139 FFC= 0.0000 BMB= 0.0000 OCN=-0.1139 TBS= 0.0000	NET=-0.0514 FFC= 0.0000 BMB= 0.0000 OCN=-0.0514 TBS= 0.0000	NET=-0.0016 FFC= 0.0000 BMB= 0.0000 OCN=-0.0016 TBS= 0.0000	NET=-0.0444 FFC= 0.0000 BMB= 0.0000 OCN=-0.0444 TBS= 0.0000	NET=-0.1172 FFC= 0.0000 BMB= 0.0000 OCN=-0.1172 TBS= 0.0000	NET= 0.0646 FFC= 0.0892 BMB= 0.0000 OCN=-0.0374 TBS= 0.0028	NET= 0.4728 FFC= 0.4590 BMB= 0.0000 OCN= 0.0000 TBS= 0.0138
47.5	NET= 0.0134 FFC= 0.0047 BMB= 0.0000 OCN= 0.0000 TBS= 0.0087	NET= 0.0119 FFC= 0.0051 BMB= 0.0000 OCN= 0.0000 TBS= 0.0069	NET=-0.1115 FFC= 0.0000 BMB= 0.0000 OCN=-0.1115 TBS= 0.0000	NET=-0.0817 FFC= 0.0000 BMB= 0.0000 OCN=-0.0817 TBS= 0.0000	NET=-0.1205 FFC= 0.0000 BMB= 0.0000 OCN=-0.1206 TBS= 0.0000	NET=-0.0375 FFC= 0.0000 BMB= 0.0000 OCN=-0.0375 TBS= 0.0000	NET=-0.1164 FFC= 0.0000 BMB= 0.0000 OCN=-0.1164 TBS= 0.0000	NET=-0.0781 FFC= 0.0000 BMB= 0.0000 OCN=-0.0781 TBS= 0.0000	NET=-0.0361 FFC= 0.0000 BMB= 0.0000 OCN=-0.0361 TBS= 0.0000	NET=-0.0622 FFC= 0.0000 BMB= 0.0000 OCN=-0.0622 TBS= 0.0000	NET= 0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0010 TBS= 0.0012	NET= 0.0727 FFC= 0.0660 BMB= 0.0000 OCN= 0.0000 TBS= 0.0067
42.5	NET=-0.0058 FFC= 0.0000 BMB= 0.0000 OCN=-0.0067 TBS= 0.0009	NET=-0.0036 FFC= 0.0000 BMB= 0.0000 OCN=-0.0072 TBS= 0.0036	NET=-0.0285 FFC= 0.0000 BMB= 0.0000 OCN=-0.0286 TBS= 0.0000	NET=-0.0408 FFC= 0.0000 BMB= 0.0000 OCN=-0.0408 TBS= 0.0000	NET=-0.0327 FFC= 0.0000 BMB= 0.0000 OCN=-0.0327 TBS= 0.0000	NET=-0.0778 FFC= 0.0000 BMB= 0.0000 OCN=-0.0778 TBS= 0.0000	NET=-0.0727 FFC= 0.0000 BMB= 0.0000 OCN=-0.0727 TBS= 0.0000	NET=-0.0336 FFC= 0.0000 BMB= 0.0000 OCN=-0.0336 TBS= 0.0000	NET=-0.0538 FFC= 0.0000 BMB= 0.0000 OCN=-0.0538 TBS= 0.0000	NET=-0.0361 FFC= 0.0000 BMB= 0.0000 OCN=-0.0361 TBS= 0.0000	NET= 0.0362 FFC= 0.0453 BMB= 0.0000 OCN=-0.0090 TBS=-0.0001	NET= 0.0787 FFC= 0.0769 BMB= 0.0000 OCN= 0.0000 TBS= 0.0018
37.5	NET=-0.0081 FFC= 0.0000 BMB= 0.0000 OCN=-0.0081 TBS= 0.0000	NET=-0.0248 FFC= 0.0000 BMB= 0.0000 OCN=-0.0243 TBS= 0.0001	NET=-0.0273 FFC= 0.0000 BMB= 0.0000 OCN=-0.0273 TBS= 0.0000	NET=-0.0450 FFC= 0.0000 BMB= 0.0000 OCN=-0.0450 TBS= 0.0000	NET=-0.0648 FFC= 0.0000 BMB= 0.0000 OCN=-0.0648 TBS= 0.0000	NET=-0.0064 FFC= 0.0000 BMB= 0.0000 OCN=-0.0064 TBS= 0.0000	NET=-0.0060 FFC= 0.0000 BMB= 0.0000 OCN=-0.0060 TBS= 0.0000	NET=-0.0100 FFC= 0.0000 BMB= 0.0000 OCN=-0.0100 TBS= 0.0000	NET=-0.0336 FFC= 0.0000 BMB= 0.0000 OCN=-0.0336 TBS= 0.0000	NET=-0.0319 FFC= 0.0000 BMB= 0.0000 OCN=-0.0318 TBS= 0.0000	NET= 0.0370 FFC= 0.0414 BMB= 0.0000 OCN=-0.0006 TBS=-0.0038	NET= 0.0445 FFC= 0.0437 BMB= 0.0000 OCN= 0.0000 TBS=-0.0012
32.5	NET=-0.0025 FFC= 0.0000 BMB= 0.0000 OCN=-0.0025 TBS= 0.0000	NET=-0.0082 FFC= 0.0000 BMB= 0.0000 OCN=-0.0082 TBS= 0.0000	NET=-0.0015 FFC= 0.0000 BMB= 0.0000 OCN=-0.0015 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0018 FFC= 0.0000 BMB= 0.0000 OCN=-0.0018 TBS= 0.0000	NET=-0.0115 FFC= 0.0000 BMB= 0.0000 OCN=-0.0115 TBS= 0.0000	NET=-0.0129 FFC= 0.0000 BMB= 0.0000 OCN=-0.0129 TBS= 0.0000	NET=-0.0101 FFC= 0.0000 BMB= 0.0000 OCN=-0.0101 TBS= 0.0000	NET=-0.0068 FFC= 0.0000 BMB= 0.0000 OCN=-0.0068 TBS= 0.0000	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET= 0.0088 FFC= 0.0120 BMB= 0.0000 OCN= 0.0000 TBS=-0.0031	NET=-0.0234 FFC= 0.0102 BMB= 0.0000 OCN= 0.0000 TBS=-0.0337

Figure 10.22 Monthly Average Fluxes for March
(2.5, 57.5)x(-87.5, -32.5) (longitude)x(latitude)

	2.5	7.5	12.5	17.5	22.5	27.5	32.5	37.5	42.5	47.5	52.5	57.5
-32.5	NET= 0.0010 FFC= 0.0000 BMB= 0.0000 OCN= 0.0010 TBS= 0.0000	NET= 0.0002 FFC= 0.0000 BMB= 0.0000 OCN= 0.0002 TBS= 0.0000	NET= 0.0004 FFC= 0.0000 BMB= 0.0000 OCN= 0.0004 TBS= 0.0000	NET= 0.0339 FFC= 0.0326 BMB= 0.0000 OCN= 0.0005 TBS= 0.0008	NET= 0.0396 FFC= 0.0334 BMB= 0.0000 OCN= 0.0000 TBS= 0.0061	NET= 0.0294 FFC= 0.0313 BMB= 0.0000 OCN= 0.0000 TBS=-0.0019	NET=-0.0094 FFC= 0.0016 BMB= 0.0000 OCN= 0.0000 TBS=-0.0110	NET=-0.0005 FFC= 0.0000 BMB= 0.0000 OCN=-0.0005 TBS= 0.0000	NET=-0.0015 FFC= 0.0000 BMB= 0.0000 OCN=-0.0015 TBS= 0.0000	NET=-0.0043 FFC= 0.0000 BMB= 0.0000 OCN=-0.0043 TBS=-0.0002	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0024 FFC= 0.0000 BMB= 0.0000 OCN=-0.0024 TBS= 0.0000
-37.5	NET= 0.0006 FFC= 0.0000 BMB= 0.0000 OCN= 0.0006 TBS= 0.0000	NET= 0.0001 FFC= 0.0000 BMB= 0.0000 OCN= 0.0001 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0007 FFC= 0.0000 BMB= 0.0000 OCN= 0.0007 TBS= 0.0000	NET= 0.0015 FFC= 0.0000 BMB= 0.0000 OCN= 0.0001 TBS= 0.0013	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS=-0.0001	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET=-0.0026 FFC= 0.0000 BMB= 0.0000 OCN=-0.0026 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0010 FFC= 0.0000 BMB= 0.0000 OCN=-0.0010 TBS= 0.0000	NET=-0.0015 FFC= 0.0000 BMB= 0.0000 OCN=-0.0015 TBS= 0.0000	NET=-0.0053 FFC= 0.0000 BMB= 0.0000 OCN=-0.0053 TBS= 0.0000
-42.5	NET=-0.0049 FFC= 0.0000 BMB= 0.0000 OCN=-0.0049 TBS= 0.0000	NET=-0.0400 FFC= 0.0000 BMB= 0.0000 OCN=-0.0400 TBS= 0.0000	NET=-0.0121 FFC= 0.0000 BMB= 0.0000 OCN=-0.0121 TBS= 0.0000	NET=-0.0148 FFC= 0.0000 BMB= 0.0000 OCN=-0.0148 TBS= 0.0000	NET=-0.0440 FFC= 0.0000 BMB= 0.0000 OCN=-0.0440 TBS= 0.0000	NET=-0.0191 FFC= 0.0000 BMB= 0.0000 OCN=-0.0191 TBS= 0.0000	NET=-0.0033 FFC= 0.0000 BMB= 0.0000 OCN=-0.0033 TBS= 0.0000	NET=-0.0284 FFC= 0.0000 BMB= 0.0000 OCN=-0.0284 TBS= 0.0000	NET=-0.0066 FFC= 0.0000 BMB= 0.0000 OCN=-0.0066 TBS= 0.0000	NET=-0.0255 FFC= 0.0000 BMB= 0.0000 OCN=-0.0256 TBS= 0.0000	NET=-0.0035 FFC= 0.0000 BMB= 0.0000 OCN=-0.0035 TBS= 0.0000	NET=-0.0048 FFC= 0.0000 BMB= 0.0000 OCN=-0.0048 TBS= 0.0000
-47.5	NET=-0.0334 FFC= 0.0000 BMB= 0.0000 OCN=-0.0334 TBS= 0.0000	NET=-0.0017 FFC= 0.0000 BMB= 0.0000 OCN=-0.0017 TBS= 0.0000	NET=-0.0331 FFC= 0.0000 BMB= 0.0000 OCN=-0.0331 TBS= 0.0000	NET=-0.0597 FFC= 0.0000 BMB= 0.0000 OCN=-0.0597 TBS= 0.0000	NET=-0.0444 FFC= 0.0000 BMB= 0.0000 OCN=-0.0444 TBS= 0.0000	NET=-0.0701 FFC= 0.0000 BMB= 0.0000 OCN=-0.0701 TBS= 0.0000	NET=-0.0127 FFC= 0.0000 BMB= 0.0000 OCN=-0.0127 TBS= 0.0000	NET=-0.0350 FFC= 0.0000 BMB= 0.0000 OCN=-0.0350 TBS= 0.0000	NET=-0.0434 FFC= 0.0000 BMB= 0.0000 OCN=-0.0434 TBS= 0.0000	NET=-0.0281 FFC= 0.0000 BMB= 0.0000 OCN=-0.0281 TBS= 0.0000	NET=-0.0124 FFC= 0.0000 BMB= 0.0000 OCN=-0.0124 TBS= 0.0000	NET=-0.0141 FFC= 0.0000 BMB= 0.0000 OCN=-0.0141 TBS= 0.0000
-52.5	NET=-0.0043 FFC= 0.0000 BMB= 0.0000 OCN=-0.0043 TBS= 0.0000	NET=-0.0348 FFC= 0.0000 BMB= 0.0000 OCN=-0.0348 TBS= 0.0000	NET=-0.0251 FFC= 0.0000 BMB= 0.0000 OCN=-0.0251 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0602 FFC= 0.0000 BMB= 0.0000 OCN=-0.0602 TBS= 0.0000	NET=-0.0606 FFC= 0.0000 BMB= 0.0000 OCN=-0.0606 TBS= 0.0000	NET=-0.0080 FFC= 0.0000 BMB= 0.0000 OCN=-0.0080 TBS= 0.0000	NET=-0.0689 FFC= 0.0000 BMB= 0.0000 OCN=-0.0689 TBS= 0.0000	NET=-0.0323 FFC= 0.0000 BMB= 0.0000 OCN=-0.0323 TBS= 0.0000	NET=-0.0082 FFC= 0.0000 BMB= 0.0000 OCN=-0.0082 TBS= 0.0000	NET=-0.0106 FFC= 0.0000 BMB= 0.0000 OCN=-0.0106 TBS= 0.0000	NET=-0.0025 FFC= 0.0000 BMB= 0.0000 OCN=-0.0025 TBS= 0.0000
-57.5	NET=-0.0016 FFC= 0.0000 BMB= 0.0000 OCN=-0.0016 TBS= 0.0000	NET=-0.0032 FFC= 0.0000 BMB= 0.0000 OCN=-0.0032 TBS= 0.0000	NET=-0.0012 FFC= 0.0000 BMB= 0.0000 OCN=-0.0012 TBS= 0.0000	NET=-0.0015 FFC= 0.0000 BMB= 0.0000 OCN=-0.0015 TBS= 0.0000	NET=-0.0016 FFC= 0.0000 BMB= 0.0000 OCN=-0.0016 TBS= 0.0000	NET=-0.0012 FFC= 0.0000 BMB= 0.0000 OCN=-0.0012 TBS= 0.0000	NET=-0.0017 FFC= 0.0000 BMB= 0.0000 OCN=-0.0017 TBS= 0.0000	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0007 FFC= 0.0000 BMB= 0.0000 OCN=-0.0007 TBS= 0.0000	NET=-0.0044 FFC= 0.0000 BMB= 0.0000 OCN=-0.0044 TBS= 0.0000
-62.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-67.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-72.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-77.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-82.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-87.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000

Figure 10.23 Monthly Average Fluxes for March
(2.5, 57.5)x(-27.5, 27.5) (longitude)x(latitude)

	2.5	7.5	12.5	17.5	22.5	27.5	32.5	37.5	42.5	47.5	52.5	57.5
27.5	NET= 0.0006 FFC= 0.0040 BMB= 0.0000 OCN= 0.0000 TBS=-0.0035	NET= 0.0025 FFC= 0.0058 BMB= 0.0000 OCN= 0.0000 TBS=-0.0033	NET=-0.0045 FFC= 0.0030 BMB= 0.0000 OCN= 0.0000 TBS=-0.0075	NET=-0.0048 FFC= 0.0036 BMB= 0.0000 OCN= 0.0000 TBS=-0.0084	NET=-0.0063 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS=-0.0070	NET= 0.0013 FFC= 0.0070 BMB= 0.0000 OCN= 0.0000 TBS=-0.0057	NET=-0.0003 FFC= 0.0224 BMB= 0.0000 OCN= 0.0000 TBS=-0.0228	NET=-0.0002 FFC= 0.0128 BMB= 0.0000 OCN= 0.0000 TBS=-0.0130	NET= 0.0110 FFC= 0.0278 BMB= 0.0000 OCN= 0.0000 TBS=-0.0168	NET= 0.0618 FFC= 0.0648 BMB= 0.0000 OCN= 0.0000 TBS=-0.0030	NET= 0.0274 FFC= 0.0374 BMB= 0.0000 OCN= 0.0000 TBS=-0.0100	NET= 0.0162 FFC= 0.0205 BMB= 0.0000 OCN= 0.0000 TBS=-0.0043
22.5	NET= 0.1898 FFC= 0.0020 BMB= 0.1896 OCN= 0.0000 TBS=-0.0017	NET= 0.1305 FFC= 0.0086 BMB= 0.1243 OCN= 0.0000 TBS=-0.0024	NET= 0.0941 FFC= 0.0010 BMB= 0.0947 OCN= 0.0000 TBS=-0.0016	NET=-0.0020 FFC= 0.0004 BMB= 0.0000 OCN= 0.0000 TBS=-0.0024	NET=-0.0010 FFC= 0.0011 BMB= 0.0000 OCN= 0.0000 TBS=-0.0021	NET=-0.0018 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS=-0.0018	NET= 0.0068 FFC= 0.0101 BMB= 0.0000 OCN= 0.0000 TBS=-0.0033	NET= 0.0481 FFC= 0.0204 BMB= 0.0318 OCN= 0.0000 TBS=-0.0038	NET= 0.0930 FFC= 0.0163 BMB= 0.0789 OCN= 0.0000 TBS=-0.0023	NET= 0.0343 FFC= 0.0356 BMB= 0.0000 OCN= 0.0000 TBS=-0.0013	NET= 0.0280 FFC= 0.0305 BMB= 0.0000 OCN= 0.0000 TBS=-0.0025	NET= 0.0168 FFC= 0.0180 BMB= 0.0000 OCN= 0.0000 TBS=-0.0012
17.5	NET= 0.7538 FFC= 0.0001 BMB= 0.7579 OCN= 0.0000 TBS=-0.0042	NET= 0.5610 FFC= 0.0002 BMB= 0.5642 OCN= 0.0000 TBS=-0.0034	NET= 0.3753 FFC= 0.0000 BMB= 0.3790 OCN= 0.0000 TBS=-0.0037	NET= 0.6741 FFC= 0.0000 BMB= 0.6790 OCN= 0.0000 TBS=-0.0049	NET= 0.3128 FFC= 0.0000 BMB= 0.3158 OCN= 0.0000 TBS=-0.0030	NET= 0.6456 FFC= 0.0000 BMB= 0.6474 OCN= 0.0000 TBS=-0.0018	NET= 0.8772 FFC= 0.0006 BMB= 0.8780 OCN= 0.0000 TBS=-0.0014	NET= 0.6832 FFC= 0.0002 BMB= 0.6847 OCN= 0.0000 TBS=-0.0017	NET= 0.5336 FFC= 0.0131 BMB= 0.5211 OCN= 0.0000 TBS=-0.0007	NET= 0.0017 FFC= 0.0020 BMB= 0.0000 OCN= 0.0000 TBS=-0.0003	NET= 0.0691 FFC= 0.0070 BMB= 0.0632 OCN= 0.0000 TBS=-0.0011	NET= 0.0505 FFC= 0.0044 BMB= 0.0474 OCN= 0.0000 TBS=-0.0013
12.5	NET= 1.5574 FFC= 0.0020 BMB= 1.5474 OCN= 0.0000 TBS= 0.0081	NET= 0.7280 FFC= 0.0084 BMB= 0.7105 OCN= 0.0000 TBS= 0.0091	NET= 0.5330 FFC= 0.0061 BMB= 0.5211 OCN= 0.0000 TBS= 0.0058	NET= 0.7836 FFC= 0.0001 BMB= 0.7795 OCN= 0.0000 TBS= 0.0040	NET= 0.8245 FFC= 0.0003 BMB= 0.8158 OCN= 0.0000 TBS= 0.0084	NET= 1.2388 FFC= 0.0008 BMB= 1.2318 OCN= 0.0000 TBS= 0.0062	NET= 1.0823 FFC= 0.0005 BMB= 1.0737 OCN= 0.0000 TBS= 0.0081	NET= 0.7080 FFC= 0.0006 BMB= 0.6947 OCN= 0.0000 TBS= 0.0127	NET= 0.8620 FFC= 0.0021 BMB= 0.8474 OCN= 0.0000 TBS= 0.0125	NET= 0.0099 FFC= 0.0014 BMB= 0.0000 OCN= 0.0000 TBS= 0.0085	NET= 0.3482 FFC= 0.0000 BMB= 0.3474 OCN= 0.0000 TBS= 0.0008	NET= 0.0164 FFC= 0.0000 BMB= 0.0158 OCN= 0.0006 TBS= 0.0000
7.5	NET= 0.0292 FFC= 0.0051 BMB= 0.0000 OCN= 0.0000 TBS= 0.0241	NET= 0.0344 FFC= 0.0093 BMB= 0.0000 OCN= 0.0000 TBS= 0.0251	NET= 0.0934 FFC= 0.0046 BMB= 0.0632 OCN= 0.0000 TBS= 0.0257	NET= 0.3384 FFC= 0.0001 BMB= 0.3158 OCN= 0.0000 TBS= 0.0225	NET= 0.5283 FFC= 0.0001 BMB= 0.5063 OCN= 0.0000 TBS= 0.0219	NET= 0.4481 FFC= 0.0004 BMB= 0.4253 OCN= 0.0000 TBS= 0.0224	NET= 0.7333 FFC= 0.0004 BMB= 0.7105 OCN= 0.0000 TBS= 0.0224	NET= 0.8787 FFC= 0.0006 BMB= 0.8602 OCN= 0.0000 TBS= 0.0180	NET= 0.2937 FFC= 0.0006 BMB= 0.2788 OCN= 0.0000 TBS= 0.0143	NET= 0.2104 FFC= 0.0004 BMB= 0.1896 OCN= 0.0000 TBS= 0.0205	NET= 0.0543 FFC= 0.0000 BMB= 0.0474 OCN= 0.0000 TBS= 0.0069	NET= 0.0106 FFC= 0.0000 BMB= 0.0000 OCN= 0.0106 TBS= 0.0000
2.5	NET= 0.0169 FFC= 0.0000 BMB= 0.0000 OCN= 0.0004 TBS= 0.0165	NET= 0.0254 FFC= 0.0021 BMB= 0.0000 OCN= 0.0017 TBS= 0.0217	NET= 0.0276 FFC= 0.0027 BMB= 0.0000 OCN= 0.0000 TBS= 0.0249	NET= 0.0221 FFC= 0.0008 BMB= 0.0000 OCN= 0.0000 TBS= 0.0213	NET= 0.0256 FFC= 0.0003 BMB= 0.0000 OCN= 0.0000 TBS= 0.0253	NET= 0.0306 FFC= 0.0004 BMB= 0.0000 OCN= 0.0000 TBS= 0.0302	NET= 0.0259 FFC= 0.0009 BMB= 0.0000 OCN= 0.0000 TBS= 0.0250	NET= 0.0113 FFC= 0.0015 BMB= 0.0000 OCN= 0.0000 TBS= 0.0098	NET= 0.0163 FFC= 0.0007 BMB= 0.0000 OCN= 0.0000 TBS= 0.0156	NET= 0.0529 FFC= 0.0002 BMB= 0.0316 OCN= 0.0000 TBS= 0.0211	NET= 0.0041 FFC= 0.0000 BMB= 0.0000 OCN= 0.0037 TBS= 0.0004	NET= 0.0085 FFC= 0.0000 BMB= 0.0000 OCN= 0.0085 TBS= 0.0000
-2.5	NET= 0.0027 FFC= 0.0000 BMB= 0.0000 OCN= 0.0027 TBS= 0.0000	NET= 0.0035 FFC= 0.0002 BMB= 0.0000 OCN= 0.0033 TBS= 0.0000	NET= 0.0013 FFC= 0.0017 BMB= 0.0000 OCN= 0.0000 TBS=-0.0004	NET= 0.0010 FFC= 0.0008 BMB= 0.0000 OCN= 0.0000 TBS= 0.0002	NET=-0.0011 FFC= 0.0003 BMB= 0.0000 OCN= 0.0000 TBS=-0.0014	NET=-0.0057 FFC= 0.0005 BMB= 0.0000 OCN= 0.0000 TBS=-0.0062	NET= 0.0004 FFC= 0.0007 BMB= 0.0000 OCN= 0.0000 TBS=-0.0003	NET= 0.0009 FFC= 0.0017 BMB= 0.0000 OCN= 0.0000 TBS=-0.0008	NET= 0.0154 FFC= 0.0003 BMB= 0.0000 OCN= 0.0000 TBS= 0.0150	NET= 0.0046 FFC= 0.0000 BMB= 0.0000 OCN= 0.0008 TBS= 0.0038	NET= 0.0038 FFC= 0.0000 BMB= 0.0000 OCN= 0.0038 TBS= 0.0000	NET= 0.0018 FFC= 0.0000 BMB= 0.0000 OCN= 0.0018 TBS= 0.0000
-7.5	NET= 0.0066 FFC= 0.0000 BMB= 0.0000 OCN= 0.0066 TBS= 0.0000	NET= 0.0024 FFC= 0.0000 BMB= 0.0000 OCN= 0.0024 TBS= 0.0000	NET=-0.0037 FFC= 0.0003 BMB= 0.0000 OCN= 0.0000 TBS=-0.0040	NET=-0.0089 FFC= 0.0004 BMB= 0.0000 OCN= 0.0000 TBS=-0.0093	NET=-0.0282 FFC= 0.0004 BMB= 0.0000 OCN= 0.0000 TBS=-0.0286	NET=-0.0216 FFC= 0.0003 BMB= 0.0000 OCN= 0.0000 TBS=-0.0219	NET=-0.0276 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS=-0.0282	NET=-0.0200 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS=-0.0206	NET= 0.0029 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0029	NET= 0.0015 FFC= 0.0000 BMB= 0.0000 OCN= 0.0015 TBS= 0.0000	NET= 0.0003 FFC= 0.0000 BMB= 0.0000 OCN= 0.0003 TBS= 0.0000	NET= 0.0006 FFC= 0.0001 BMB= 0.0000 OCN= 0.0005 TBS= 0.0000
-12.5	NET= 0.0017 FFC= 0.0000 BMB= 0.0000 OCN= 0.0017 TBS= 0.0000	NET= 0.0023 FFC= 0.0000 BMB= 0.0000 OCN= 0.0023 TBS= 0.0000	NET=-0.0001 FFC= 0.0001 BMB= 0.0000 OCN= 0.0001 TBS=-0.0004	NET=-0.0090 FFC= 0.0004 BMB= 0.0000 OCN= 0.0000 TBS=-0.0094	NET=-0.0202 FFC= 0.0005 BMB= 0.0000 OCN= 0.0000 TBS=-0.0207	NET=-0.0276 FFC= 0.0009 BMB= 0.0000 OCN= 0.0000 TBS=-0.0286	NET=-0.0348 FFC= 0.0007 BMB= 0.0000 OCN= 0.0000 TBS=-0.0356	NET=-0.0280 FFC= 0.0004 BMB= 0.0000 OCN= 0.0000 TBS=-0.0284	NET= 0.0001 FFC= 0.0001 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0007 FFC= 0.0001 BMB= 0.0000 OCN=-0.0002 TBS=-0.0006	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000
-17.5	NET= 0.0005 FFC= 0.0000 BMB= 0.0000 OCN= 0.0005 TBS= 0.0000	NET= 0.0015 FFC= 0.0000 BMB= 0.0000 OCN= 0.0015 TBS= 0.0000	NET=-0.0005 FFC= 0.0001 BMB= 0.0000 OCN= 0.0000 TBS=-0.0006	NET=-0.0111 FFC= 0.0002 BMB= 0.0000 OCN= 0.0000 TBS=-0.0113	NET=-0.0141 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS=-0.0147	NET=-0.0264 FFC= 0.0053 BMB= 0.0000 OCN= 0.0000 TBS=-0.0318	NET=-0.0301 FFC= 0.0066 BMB= 0.0000 OCN= 0.0000 TBS=-0.0368	NET=-0.0237 FFC= 0.0002 BMB= 0.0000 OCN= 0.0000 TBS=-0.0239	NET=-0.0020 FFC= 0.0001 BMB= 0.0000 OCN= 0.0000 TBS=-0.0021	NET=-0.0104 FFC= 0.0003 BMB= 0.0000 OCN= 0.0000 TBS=-0.0106	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0027 FFC= 0.0000 BMB= 0.0000 OCN=-0.0027 TBS= 0.0000
-22.5	NET= 0.0023 FFC= 0.0000 BMB= 0.0000 OCN= 0.0023 TBS= 0.0000	NET= 0.0022 FFC= 0.0000 BMB= 0.0000 OCN= 0.0022 TBS= 0.0000	NET= 0.0011 FFC= 0.0000 BMB= 0.0000 OCN= 0.0014 TBS=-0.0003	NET=-0.0060 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS=-0.0060	NET=-0.0037 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS=-0.0043	NET= 0.0025 FFC= 0.0154 BMB= 0.0000 OCN= 0.0000 TBS=-0.0129	NET=-0.0129 FFC= 0.0100 BMB= 0.0000 OCN= 0.0000 TBS=-0.0229	NET=-0.0072 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS=-0.0072	NET=-0.0053 FFC= 0.0001 BMB= 0.0000 OCN=-0.0042 TBS=-0.0013	NET=-0.0248 FFC= 0.0002 BMB= 0.0000 OCN= 0.0000 TBS=-0.0250	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0038 FFC= 0.0018 BMB= 0.0000 OCN=-0.0056 TBS= 0.0000
-27.5	NET= 0.0013 FFC= 0.0000 BMB= 0.0000 OCN= 0.0013 TBS= 0.0000	NET= 0.0028 FFC= 0.0000 BMB= 0.0000 OCN= 0.0028 TBS= 0.0000	NET= 0.0012 FFC= 0.0000 BMB= 0.0000 OCN= 0.0012 TBS= 0.0000	NET= 0.0082 FFC= 0.0064 BMB= 0.0000 OCN= 0.0000 TBS= 0.0018	NET= 0.0363 FFC= 0.0348 BMB= 0.0000 OCN= 0.0000 TBS= 0.0015	NET= 0.0865 FFC= 0.0901 BMB= 0.0000 OCN= 0.0000 TBS=-0.0036	NET= 0.0087 FFC= 0.0301 BMB= 0.0000 OCN= 0.0000 TBS=-0.0214	NET=-0.0013 FFC= 0.0000 BMB= 0.0000 OCN=-0.0013 TBS= 0.0000	NET=-0.0070 FFC= 0.0000 BMB= 0.0000 OCN=-0.0070 TBS= 0.0000	NET=-0.0087 FFC= 0.0000 BMB= 0.0000 OCN=-0.0018 TBS=-0.0068	NET=-0.0068 FFC= 0.0000 BMB= 0.0000 OCN=-0.0068 TBS= 0.0000	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000

Figure 10.24 Monthly Average Fluxes for March
(2.5, 57.5)x(32.5, 87.5) (longitude)x(latitude)

	2.5	7.5	12.5	17.5	22.5	27.5	32.5	37.5	42.5	47.5	52.5	57.5
87.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
82.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
77.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0087 FFC= 0.0000 BMB= 0.0000 OCN=-0.0087 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
72.5	NET=-0.0028 FFC= 0.0000 BMB= 0.0000 OCN=-0.0028 TBS= 0.0000	NET=-0.0050 FFC= 0.0000 BMB= 0.0000 OCN=-0.0050 TBS= 0.0000	NET=-0.0015 FFC= 0.0000 BMB= 0.0000 OCN=-0.0015 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET= 0.0006 FFC= 0.0007 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET= 0.0024 FFC= 0.0029 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0025 FFC= 0.0000 BMB= 0.0000 OCN=-0.0025 TBS= 0.0001	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
67.5	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0083 FFC= 0.0000 BMB= 0.0000 OCN=-0.0083 TBS= 0.0000	NET=-0.0128 FFC= 0.0015 BMB= 0.0000 OCN=-0.0145 TBS= 0.0002	NET= 0.0036 FFC= 0.0087 BMB= 0.0000 OCN=-0.0071 TBS= 0.0019	NET= 0.0131 FFC= 0.0158 BMB= 0.0000 OCN=-0.0068 TBS= 0.0040	NET= 0.0222 FFC= 0.0232 BMB= 0.0000 OCN=-0.0053 TBS= 0.0043	NET= 0.0369 FFC= 0.0358 BMB= 0.0000 OCN=-0.0075 TBS= 0.0086	NET=-0.0045 FFC= 0.0000 BMB= 0.0000 OCN=-0.0090 TBS= 0.0045	NET= 0.0122 FFC= 0.0113 BMB= 0.0000 OCN= 0.0000 TBS= 0.0009	NET= 0.0076 FFC= 0.0068 BMB= 0.0000 OCN= 0.0000 TBS= 0.0007	NET= 0.0166 FFC= 0.0158 BMB= 0.0000 OCN= 0.0000 TBS= 0.0008	NET= 0.0120 FFC= 0.0113 BMB= 0.0000 OCN= 0.0000 TBS= 0.0007
62.5	NET=-0.0032 FFC= 0.0000 BMB= 0.0000 OCN=-0.0032 TBS= 0.0000	NET=-0.0098 FFC= 0.0145 BMB= 0.0000 OCN=-0.0258 TBS= 0.0015	NET= 0.0264 FFC= 0.0206 BMB= 0.0000 OCN=-0.0012 TBS= 0.0071	NET= 0.0316 FFC= 0.0163 BMB= 0.0000 OCN= 0.0000 TBS= 0.0153	NET= 0.0634 FFC= 0.0467 BMB= 0.0000 OCN= 0.0000 TBS= 0.0167	NET= 0.0643 FFC= 0.0336 BMB= 0.0000 OCN= 0.0000 TBS= 0.0307	NET= 0.0582 FFC= 0.0339 BMB= 0.0000 OCN= 0.0000 TBS= 0.0242	NET= 0.0500 FFC= 0.0317 BMB= 0.0000 OCN= 0.0000 TBS= 0.0183	NET= 0.0566 FFC= 0.0427 BMB= 0.0000 OCN= 0.0000 TBS= 0.0139	NET= 0.0510 FFC= 0.0384 BMB= 0.0000 OCN= 0.0000 TBS= 0.0126	NET= 0.0594 FFC= 0.0452 BMB= 0.0000 OCN= 0.0000 TBS= 0.0142	NET= 0.0303 FFC= 0.0226 BMB= 0.0000 OCN= 0.0000 TBS= 0.0077
57.5	NET=-0.0524 FFC= 0.0000 BMB= 0.0000 OCN=-0.0524 TBS= 0.0000	NET= 0.0704 FFC= 0.0656 BMB= 0.0000 OCN=-0.0025 TBS= 0.0073	NET= 0.1015 FFC= 0.0798 BMB= 0.0000 OCN= 0.0000 TBS= 0.0217	NET= 0.0643 FFC= 0.0340 BMB= 0.0000 OCN= 0.0000 TBS= 0.0303	NET= 0.0816 FFC= 0.0725 BMB= 0.0000 OCN= 0.0000 TBS= 0.0091	NET= 0.1056 FFC= 0.0805 BMB= 0.0000 OCN= 0.0000 TBS= 0.0251	NET= 0.1973 FFC= 0.1723 BMB= 0.0000 OCN= 0.0000 TBS= 0.0250	NET= 0.2782 FFC= 0.2545 BMB= 0.0000 OCN= 0.0000 TBS= 0.0237	NET= 0.1207 FFC= 0.0847 BMB= 0.0000 OCN= 0.0000 TBS= 0.0360	NET= 0.1098 FFC= 0.0830 BMB= 0.0000 OCN= 0.0000 TBS= 0.0268	NET= 0.0960 FFC= 0.0732 BMB= 0.0000 OCN= 0.0000 TBS= 0.0228	NET= 0.1072 FFC= 0.0871 BMB= 0.0000 OCN= 0.0000 TBS= 0.0201
52.5	NET= 0.2448 FFC= 0.2369 BMB= 0.0000 OCN= 0.0000 TBS= 0.0078	NET= 0.6236 FFC= 0.6182 BMB= 0.0000 OCN= 0.0000 TBS= 0.0054	NET= 0.6211 FFC= 0.6044 BMB= 0.0000 OCN= 0.0000 TBS= 0.0167	NET= 0.3948 FFC= 0.3732 BMB= 0.0000 OCN= 0.0000 TBS= 0.0216	NET= 0.3305 FFC= 0.3134 BMB= 0.0000 OCN= 0.0000 TBS= 0.0171	NET= 0.2420 FFC= 0.2168 BMB= 0.0000 OCN= 0.0000 TBS= 0.0252	NET= 0.2245 FFC= 0.2028 BMB= 0.0000 OCN= 0.0000 TBS= 0.0217	NET= 0.1552 FFC= 0.1377 BMB= 0.0000 OCN= 0.0000 TBS= 0.0175	NET= 0.0718 FFC= 0.0565 BMB= 0.0000 OCN= 0.0000 TBS= 0.0153	NET= 0.1543 FFC= 0.1378 BMB= 0.0000 OCN= 0.0000 TBS= 0.0165	NET= 0.0840 FFC= 0.0734 BMB= 0.0000 OCN= 0.0000 TBS= 0.0106	NET= 0.1152 FFC= 0.1054 BMB= 0.0000 OCN= 0.0000 TBS= 0.0098
47.5	NET= 0.2167 FFC= 0.1991 BMB= 0.0000 OCN= 0.0000 TBS= 0.0176	NET= 0.3367 FFC= 0.3142 BMB= 0.0000 OCN= 0.0000 TBS= 0.0225	NET= 0.3948 FFC= 0.3666 BMB= 0.0000 OCN= 0.0000 TBS= 0.0282	NET= 0.3413 FFC= 0.3126 BMB= 0.0000 OCN= 0.0000 TBS= 0.0287	NET= 0.2861 FFC= 0.2562 BMB= 0.0000 OCN= 0.0000 TBS= 0.0299	NET= 0.2951 FFC= 0.2671 BMB= 0.0000 OCN= 0.0000 TBS= 0.0280	NET= 0.2973 FFC= 0.2779 BMB= 0.0000 OCN= 0.0000 TBS= 0.0194	NET= 0.2452 FFC= 0.2389 BMB= 0.0000 OCN= 0.0000 TBS= 0.0063	NET= 0.0756 FFC= 0.0738 BMB= 0.0000 OCN= 0.0000 TBS= 0.0018	NET= 0.0617 FFC= 0.0623 BMB= 0.0000 OCN= 0.0000 TBS=-0.0006	NET= 0.0179 FFC= 0.0164 BMB= 0.0000 OCN= 0.0000 TBS= 0.0015	NET= 0.0147 FFC= 0.0137 BMB= 0.0000 OCN= 0.0000 TBS= 0.0010
42.5	NET= 0.0975 FFC= 0.0812 BMB= 0.0000 OCN= 0.0000 TBS= 0.0163	NET= 0.1191 FFC= 0.0983 BMB= 0.0000 OCN= 0.0000 TBS= 0.0207	NET= 0.1701 FFC= 0.1483 BMB= 0.0000 OCN= 0.0000 TBS= 0.0218	NET= 0.1241 FFC= 0.0996 BMB= 0.0000 OCN= 0.0000 TBS= 0.0245	NET= 0.1932 FFC= 0.1699 BMB= 0.0000 OCN= 0.0000 TBS= 0.0232	NET= 0.1745 FFC= 0.1496 BMB= 0.0000 OCN= 0.0000 TBS= 0.0248	NET= 0.0170 FFC= 0.0112 BMB= 0.0000 OCN= 0.0000 TBS= 0.0058	NET= 0.0192 FFC= 0.0134 BMB= 0.0000 OCN= 0.0000 TBS= 0.0058	NET= 0.1412 FFC= 0.1346 BMB= 0.0000 OCN= 0.0000 TBS= 0.0066	NET= 0.1284 FFC= 0.1274 BMB= 0.0000 OCN= 0.0000 TBS= 0.0010	NET= 0.0052 FFC= 0.0038 BMB= 0.0000 OCN= 0.0000 TBS= 0.0013	NET= 0.0374 FFC= 0.0338 BMB= 0.0000 OCN= 0.0000 TBS= 0.0036
37.5	NET= 0.0117 FFC= 0.0115 BMB= 0.0000 OCN= 0.0000 TBS= 0.0002	NET= 0.0261 FFC= 0.0290 BMB= 0.0000 OCN= 0.0000 TBS=-0.0029	NET= 0.0307 FFC= 0.0303 BMB= 0.0000 OCN= 0.0000 TBS= 0.0005	NET= 0.0207 FFC= 0.0108 BMB= 0.0000 OCN= 0.0000 TBS= 0.0100	NET= 0.0542 FFC= 0.0410 BMB= 0.0000 OCN= 0.0000 TBS= 0.0132	NET= 0.0315 FFC= 0.0195 BMB= 0.0000 OCN= 0.0000 TBS= 0.0121	NET= 0.0432 FFC= 0.0335 BMB= 0.0000 OCN= 0.0000 TBS= 0.0097	NET= 0.0498 FFC= 0.0401 BMB= 0.0000 OCN= 0.0000 TBS= 0.0097	NET= 0.0438 FFC= 0.0331 BMB= 0.0000 OCN= 0.0000 TBS= 0.0107	NET= 0.0488 FFC= 0.0347 BMB= 0.0000 OCN= 0.0000 TBS= 0.0141	NET= 0.0333 FFC= 0.0305 BMB= 0.0000 OCN= 0.0000 TBS= 0.0028	NET= 0.0324 FFC= 0.0259 BMB= 0.0000 OCN= 0.0000 TBS= 0.0065
32.5	NET=-0.0042 FFC= 0.0081 BMB= 0.0000 OCN= 0.0000 TBS=-0.0123	NET= 0.0008 FFC= 0.0102 BMB= 0.0000 OCN= 0.0000 TBS=-0.0094	NET=-0.0034 FFC= 0.0106 BMB= 0.0000 OCN= 0.0000 TBS=-0.0140	NET= 0.0012 FFC= 0.0011 BMB= 0.0000 OCN= 0.0000 TBS= 0.0001	NET=-0.0061 FFC= 0.0053 BMB= 0.0000 OCN= 0.0000 TBS=-0.0114	NET= 0.0114 FFC= 0.0107 BMB= 0.0000 OCN= 0.0000 TBS= 0.0007	NET= 0.0388 FFC= 0.0367 BMB= 0.0000 OCN= 0.0000 TBS= 0.0021	NET= 0.0268 FFC= 0.0472 BMB= 0.0000 OCN= 0.0000 TBS=-0.0204	NET=-0.0276 FFC= 0.0238 BMB= 0.0000 OCN= 0.0000 TBS=-0.0513	NET= 0.0228 FFC= 0.0225 BMB= 0.0000 OCN= 0.0000 TBS= 0.0002	NET= 0.0173 FFC= 0.0192 BMB= 0.0000 OCN= 0.0000 TBS=-0.0019	NET= 0.0165 FFC= 0.0141 BMB= 0.0000 OCN= 0.0000 TBS= 0.0024

Figure 10.25 Monthly Average Fluxes for March
(62.5, 117.5)x(-87.5, -32.5) (longitude)x(latitude)

Latitude		62.5	67.5	72.5	77.5	82.5	87.5	92.5	97.5	102.5	107.5	112.5	117.5
-32.5	NET=	-0.0033	-0.0005	-0.0001	-0.0011	-0.0039	-0.0001	-0.0020	-0.0036	-0.0028	-0.0020	-0.0024	0.0254
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0158
	BMB=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	-0.0033	-0.0005	-0.0001	-0.0011	-0.0039	-0.0001	-0.0020	-0.0036	-0.0028	-0.0020	-0.0024	0.0000
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0096
-37.5	NET=	-0.0027	-0.0030	-0.0043	-0.0001	-0.0003	-0.0001	0.0000	0.0000	-0.0008	-0.0001	-0.0001	0.0033
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BMB=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	-0.0027	-0.0030	-0.0043	-0.0001	-0.0003	-0.0001	0.0000	0.0000	-0.0008	-0.0001	-0.0001	0.0000
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0033
-42.5	NET=	-0.0007	-0.0065	-0.0023	-0.0016	-0.0094	-0.0075	-0.0166	-0.0063	-0.0069	-0.0246	-0.0034	-0.0103
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BMB=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	-0.0007	-0.0065	-0.0023	-0.0016	-0.0094	-0.0075	-0.0166	-0.0063	-0.0069	-0.0346	-0.0034	-0.0103
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
-47.5	NET=	-0.0184	-0.0069	-0.0136	-0.0223	-0.0013	-0.0229	-0.0296	-0.0436	-0.0615	-0.0040	-0.0255	-0.0292
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BMB=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	-0.0184	-0.0069	-0.0136	-0.0223	-0.0013	-0.0229	-0.0296	-0.0436	-0.0615	-0.0040	-0.0256	-0.0292
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
-52.5	NET=	-0.0208	-0.0278	-0.0017	-0.0129	-0.0136	-0.0218	-0.0060	-0.0120	-0.0158	-0.0229	-0.0141	-0.0151
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BMB=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	-0.0208	-0.0278	-0.0017	-0.0129	-0.0136	-0.0218	-0.0050	-0.0120	-0.0156	-0.0229	-0.0141	-0.0151
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
-57.5	NET=	-0.0032	-0.0030	-0.0043	-0.0036	-0.0010	-0.0028	-0.0004	-0.0023	-0.0106	-0.0007	-0.0021	-0.0161
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BMB=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	-0.0032	-0.0030	-0.0043	-0.0036	-0.0010	-0.0028	-0.0004	-0.0023	-0.0105	-0.0007	-0.0021	-0.0151
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
-62.5	NET=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0004	-0.0002	-0.0003
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BMB=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0004	-0.0002	-0.0003
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
-67.5	NET=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BMB=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
-72.5	NET=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BMB=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
-77.5	NET=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BMB=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
-82.5	NET=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BMB=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
-87.5	NET=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BMB=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Figure 10.26 Monthly Average Fluxes for March
(62.5, 117.5)x(-27.5, 27.5) (longitude)x(latitude)

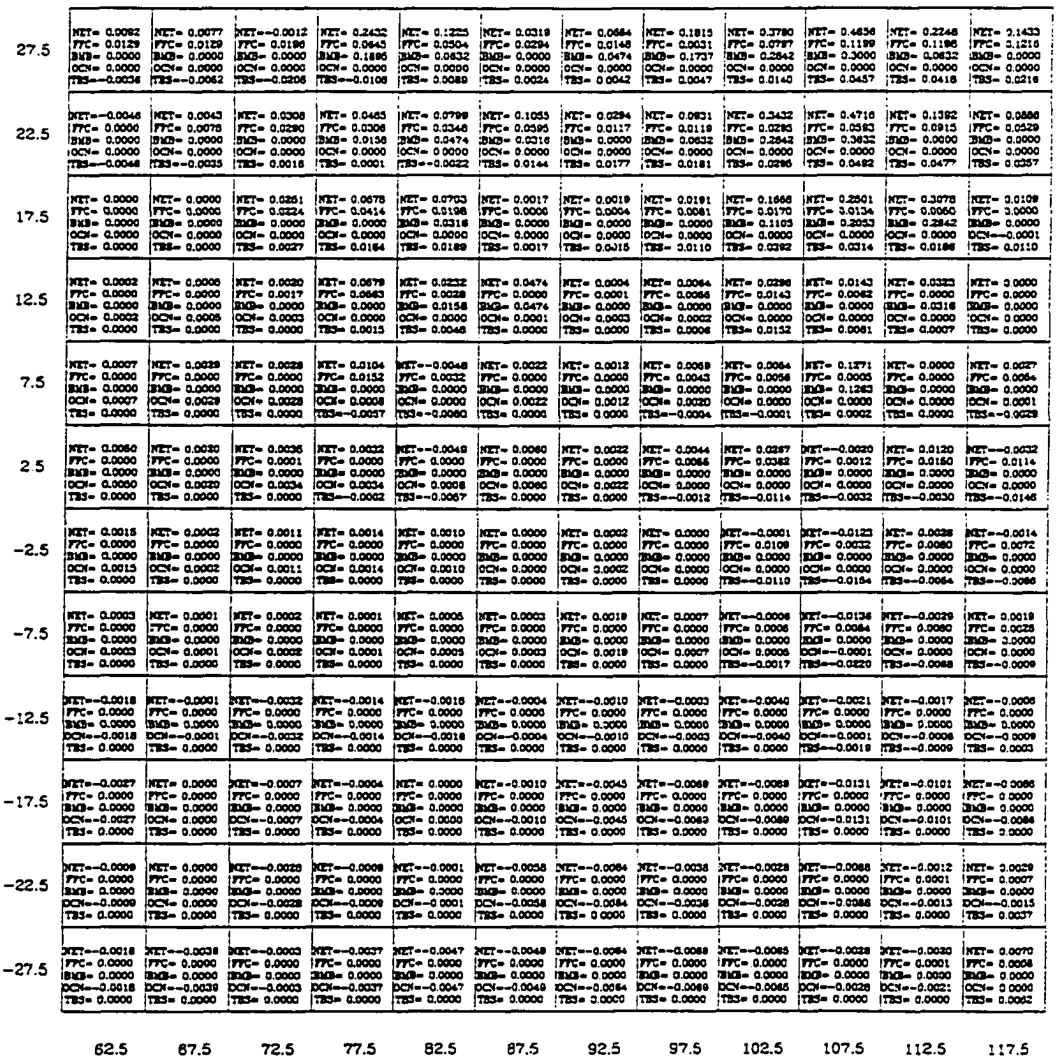

Figure 10.27 Monthly Average Fluxes for March
(62.5, 117.5)x(32.5, 87.5) (longitude)x(latitude)

	62.5	67.5	72.5	77.5	82.5	87.5	92.5	97.5	102.5	107.5	112.5	117.5
87.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
82.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
77.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
72.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0046 FFC= 0.0046 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS=-0.0002	NET= 0.0090 FFC= 0.0090 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0046 FFC= 0.0045 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
67.5	NET= 0.0182 FFC= 0.0181 BMB= 0.0000 OCN= 0.0000 TBS= 0.0001	NET= 0.0090 FFC= 0.0090 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0228 FFC= 0.0228 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS=-0.0001	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
62.5	NET= 0.0218 FFC= 0.0181 BMB= 0.0000 OCN= 0.0000 TBS= 0.0037	NET= 0.0082 FFC= 0.0068 BMB= 0.0000 OCN= 0.0000 TBS= 0.0014	NET= 0.0073 FFC= 0.0068 BMB= 0.0000 OCN= 0.0000 TBS= 0.0006	NET= 0.0068 FFC= 0.0068 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0001	NET= 0.0002 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0002	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0045 FFC= 0.0045 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0136 FFC= 0.0136 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0249 FFC= 0.0249 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
57.5	NET= 0.1220 FFC= 0.1044 BMB= 0.0000 OCN= 0.0000 TBS= 0.0176	NET= 0.0646 FFC= 0.0452 BMB= 0.0000 OCN= 0.0000 TBS= 0.0063	NET= 0.0698 FFC= 0.0644 BMB= 0.0000 OCN= 0.0000 TBS= 0.0066	NET= 0.0187 FFC= 0.0158 BMB= 0.0000 OCN= 0.0000 TBS= 0.0029	NET= 0.0641 FFC= 0.0606 BMB= 0.0000 OCN= 0.0000 TBS= 0.0036	NET= 0.0487 FFC= 0.0444 BMB= 0.0000 OCN= 0.0000 TBS= 0.0044	NET= 0.0614 FFC= 0.0567 BMB= 0.0000 OCN= 0.0000 TBS= 0.0047	NET= 0.0276 FFC= 0.0249 BMB= 0.0000 OCN= 0.0000 TBS= 0.0027	NET= 0.0178 FFC= 0.0181 BMB= 0.0000 OCN= 0.0000 TBS=-0.0003	NET= 0.0123 FFC= 0.0136 BMB= 0.0000 OCN= 0.0000 TBS=-0.0013	NET= 0.0203 FFC= 0.0203 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0136 FFC= 0.0136 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
52.5	NET= 0.0540 FFC= 0.0405 BMB= 0.0000 OCN= 0.0000 TBS= 0.0136	NET= 0.0409 FFC= 0.0351 BMB= 0.0000 OCN= 0.0000 TBS= 0.0058	NET= 0.0256 FFC= 0.0214 BMB= 0.0000 OCN= 0.0000 TBS= 0.0043	NET= 0.0319 FFC= 0.0286 BMB= 0.0000 OCN= 0.0000 TBS= 0.0033	NET= 0.0609 FFC= 0.0574 BMB= 0.0000 OCN= 0.0000 TBS= 0.0034	NET= 0.0367 FFC= 0.0294 BMB= 0.0000 OCN= 0.0000 TBS= 0.0073	NET= 0.0398 FFC= 0.0294 BMB= 0.0000 OCN= 0.0000 TBS= 0.0105	NET= 0.0136 FFC= 0.0045 BMB= 0.0000 OCN= 0.0000 TBS= 0.0092	NET= 0.0323 FFC= 0.0275 BMB= 0.0000 OCN= 0.0000 TBS= 0.0048	NET= 0.0148 FFC= 0.0138 BMB= 0.0000 OCN= 0.0000 TBS= 0.0011	NET= 0.0120 FFC= 0.0113 BMB= 0.0000 OCN= 0.0000 TBS= 0.0007	NET= 0.0090 FFC= 0.0090 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
47.5	NET= 0.0212 FFC= 0.0192 BMB= 0.0000 OCN= 0.0000 TBS= 0.0020	NET= 0.0155 FFC= 0.0150 BMB= 0.0000 OCN= 0.0000 TBS= 0.0004	NET= 0.0290 FFC= 0.0288 BMB= 0.0000 OCN= 0.0000 TBS= 0.0002	NET= 0.0066 FFC= 0.0082 BMB= 0.0000 OCN= 0.0000 TBS=-0.0016	NET= 0.0167 FFC= 0.0163 BMB= 0.0000 OCN= 0.0000 TBS= 0.0004	NET= 0.0041 FFC= 0.0026 BMB= 0.0000 OCN= 0.0000 TBS= 0.0015	NET= 0.0027 FFC= 0.0004 BMB= 0.0000 OCN= 0.0000 TBS= 0.0023	NET= 0.0024 FFC= 0.0005 BMB= 0.0000 OCN= 0.0000 TBS= 0.0019	NET=-0.0008 FFC= 0.0010 BMB= 0.0000 OCN= 0.0000 TBS=-0.0018	NET= 0.0010 FFC= 0.0045 BMB= 0.0000 OCN= 0.0000 TBS=-0.0035	NET= 0.0040 FFC= 0.0026 BMB= 0.0000 OCN= 0.0000 TBS= 0.0014	NET= 0.0059 FFC= 0.0075 BMB= 0.0000 OCN= 0.0000 TBS=-0.0016
42.5	NET= 0.0245 FFC= 0.0225 BMB= 0.0000 OCN= 0.0000 TBS= 0.0020	NET= 0.1131 FFC= 0.1123 BMB= 0.0000 OCN= 0.0000 TBS= 0.0007	NET= 0.0627 FFC= 0.0606 BMB= 0.0000 OCN= 0.0000 TBS= 0.0021	NET= 0.0388 FFC= 0.0376 BMB= 0.0000 OCN= 0.0000 TBS= 0.0012	NET= 0.0063 FFC= 0.0029 BMB= 0.0000 OCN= 0.0000 TBS= 0.0034	NET= 0.0065 FFC= 0.0077 BMB= 0.0000 OCN= 0.0000 TBS=-0.0012	NET=-0.0008 FFC= 0.0021 BMB= 0.0000 OCN= 0.0000 TBS=-0.0029	NET= 0.0015 FFC= 0.0062 BMB= 0.0000 OCN= 0.0000 TBS=-0.0047	NET=-0.0077 FFC= 0.0010 BMB= 0.0000 OCN= 0.0000 TBS=-0.0088	NET=-0.0065 FFC= 0.0041 BMB= 0.0000 OCN= 0.0000 TBS=-0.0106	NET= 0.0198 FFC= 0.0271 BMB= 0.0000 OCN= 0.0000 TBS=-0.0073	NET= 0.0530 FFC= 0.0552 BMB= 0.0000 OCN= 0.0000 TBS=-0.0022
37.5	NET= 0.0427 FFC= 0.0471 BMB= 0.0000 OCN= 0.0000 TBS=-0.0044	NET= 0.1287 FFC= 0.1300 BMB= 0.0000 OCN= 0.0000 TBS=-0.0013	NET= 0.0644 FFC= 0.0583 BMB= 0.0000 OCN= 0.0000 TBS= 0.0061	NET= 0.0112 FFC= 0.0093 BMB= 0.0000 OCN= 0.0000 TBS= 0.0019	NET= 0.0216 FFC= 0.0037 BMB= 0.0158 OCN= 0.0000 TBS= 0.0021	NET= 0.0044 FFC= 0.0037 BMB= 0.0000 OCN= 0.0000 TBS= 0.0008	NET=-0.0002 FFC= 0.0034 BMB= 0.0000 OCN= 0.0000 TBS=-0.0036	NET= 0.0042 FFC= 0.0067 BMB= 0.0000 OCN= 0.0000 TBS=-0.0025	NET= 0.0184 FFC= 0.0252 BMB= 0.0000 OCN= 0.0000 TBS=-0.0068	NET= 0.0392 FFC= 0.0408 BMB= 0.0000 OCN= 0.0000 TBS=-0.0016	NET= 0.0930 FFC= 0.0966 BMB= 0.0000 OCN= 0.0000 TBS=-0.0036	NET= 0.2260 FFC= 0.2143 BMB= 0.0000 OCN= 0.0000 TBS= 0.0116
32.5	NET=-0.0098 FFC= 0.0041 BMB= 0.0000 OCN= 0.0000 TBS=-0.0139	NET= 0.0069 FFC= 0.0045 BMB= 0.0000 OCN= 0.0000 TBS= 0.0024	NET= 0.0119 FFC= 0.0191 BMB= 0.0000 OCN= 0.0000 TBS=-0.0072	NET= 0.0308 FFC= 0.0173 BMB= 0.0000 OCN= 0.0000 TBS= 0.0136	NET= 0.0010 FFC= 0.0021 BMB= 0.0000 OCN= 0.0000 TBS=-0.0011	NET=-0.0012 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS=-0.0012	NET= 0.0631 FFC= 0.0018 BMB= 0.0632 OCN= 0.0000 TBS=-0.0018	NET= 0.0104 FFC= 0.0119 BMB= 0.0000 OCN= 0.0000 TBS=-0.0015	NET= 0.0830 FFC= 0.0845 BMB= 0.0000 OCN= 0.0000 TBS=-0.0015	NET= 0.1286 FFC= 0.1111 BMB= 0.0000 OCN= 0.0000 TBS= 0.0175	NET= 0.2207 FFC= 0.2045 BMB= 0.0000 OCN= 0.0000 TBS= 0.0162	NET= 0.2622 FFC= 0.2393 BMB= 0.0000 OCN= 0.0000 TBS= 0.0229

Figure 10.28 Monthly Average Fluxes for March
(122.5, 177.5)x(-87.5, -32.5) (longitude)x(latitude)

	122.5	127.5	132.5	137.5	142.5	147.5
-32.5	NET= 0.0028 FFC= 0.0005 BMB= 0.0000 OCN= 0.0000 TBS= 0.0023	NET= 0.0087 FFC= 0.0004 BMB= 0.0000 OCN= 0.0000 TBS= 0.0083	NET= 0.0023 FFC= 0.0006 BMB= 0.0000 OCN=-0.0002 TBS= 0.0017	NET= 0.0119 FFC= 0.0176 BMB= 0.0000 OCN= 0.0000 TBS=-0.0057	NET= 0.0090 FFC= 0.0078 BMB= 0.0000 OCN= 0.0000 TBS= 0.0012	NET= 0.0135 FFC= 0.0081 BMB= 0.0000 OCN= 0.0000 TBS= 0.0064
-37.5	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0015 TBS= 0.0012	NET=-0.0018 FFC= 0.0000 BMB= 0.0000 OCN=-0.0017 TBS= 0.0000	NET=-0.0030 FFC= 0.0000 BMB= 0.0000 OCN=-0.0030 TBS= 0.0000	NET= 3.0030 FFC= 0.0002 BMB= 0.0000 OCN=-3.0010 TBS= 0.0038	NET= 0.0687 FFC= 0.0606 BMB= 0.0000 OCN=-0.0002 TBS= 3.0080	NET= 0.0215 FFC= 0.0140 BMB= 0.0000 OCN= 0.0000 TBS= 0.0075
-42.5	NET=-0.0009 FFC= 0.0000 BMB= 0.0000 OCN=-0.0009 TBS= 0.0000	NET=-0.0366 FFC= 0.0000 BMB= 0.0000 OCN=-0.0366 TBS= 0.0000	NET=-0.0137 FFC= 0.0000 BMB= 0.0000 OCN=-0.0137 TBS= 0.0000	NET=-0.0319 FFC= 0.0000 BMB= 0.0000 OCN=-0.0319 TBS= 0.0000	NET=-0.0009 FFC= 0.0000 BMB= 0.0000 OCN=-0.0021 TBS= 0.0012	NET= 0.0080 FFC= 0.0081 BMB= 0.0000 OCN=-0.0066 TBS= 0.0064
-47.5	NET=-0.0487 FFC= 0.0000 BMB= 0.0000 OCN=-0.0487 TBS= 0.0000	NET=-0.0087 FFC= 0.0000 BMB= 0.0000 OCN=-0.0087 TBS= 0.0000	NET=-0.0322 FFC= 0.0000 BMB= 0.0000 OCN=-0.0322 TBS= 0.0000	NET=-0.0307 FFC= 0.0000 BMB= 0.0000 OCN=-0.0307 TBS= 0.0000	NET=-0.0314 FFC= 0.0000 BMB= 0.0000 OCN=-0.0314 TBS= 0.0000	NET=-0.0671 FFC= 0.0000 BMB= 0.0000 OCN=-0.0676 TBS= 0.0006
-52.5	NET=-0.0218 FFC= 0.0000 BMB= 0.0000 OCN=-0.0218 TBS= 0.0000	NET=-0.0181 FFC= 0.0000 BMB= 0.0000 OCN=-0.0181 TBS= 0.0000	NET=-0.0181 FFC= 0.0000 BMB= 0.0000 OCN=-0.0181 TBS= 0.0000	NET=-0.0342 FFC= 0.0000 BMB= 0.0000 OCN=-0.0342 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0304 FFC= 0.0000 BMB= 0.0000 OCN=-0.0304 TBS= 0.0000
-57.5	NET=-0.0064 FFC= 0.0000 BMB= 0.0000 OCN=-0.0064 TBS= 0.0000	NET=-0.0132 FFC= 0.0000 BMB= 0.0000 OCN=-0.0132 TBS= 0.0000	NET=-0.0081 FFC= 0.0000 BMB= 0.0000 OCN=-0.0081 TBS= 0.0000	NET=-0.0125 FFC= 0.0000 BMB= 0.0000 OCN=-0.0125 TBS= 0.0000	NET=-0.0060 FFC= 0.0000 BMB= 0.0000 OCN=-0.0060 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-62.5	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0014 FFC= 0.0000 BMB= 0.0000 OCN=-0.0014 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000
-67.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-72.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-77.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-82.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-87.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000

	152.5	157.5	162.5	167.5	172.5	177.5
-32.5	NET= 0.0657 FFC= 0.0654 BMB= 0.0000 OCN= 0.0000 TBS= 0.0003	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0007 FFC= 0.0000 BMB= 0.0000 OCN=-0.0007 TBS= 0.0000	NET=-0.0018 FFC= 0.0000 BMB= 0.0000 OCN=-0.0018 TBS= 0.0000	NET=-0.0015 FFC= 0.0000 BMB= 0.0000 OCN=-0.0015 TBS= 0.0000	NET=-0.0017 FFC= 0.0000 BMB= 0.0000 OCN=-0.0017 TBS= 0.0000
-37.5	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS=-0.0003	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 3.0000 OCN=-0.0006 TBS= 0.0000	NET= 0.0069 FFC= 0.0070 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET= 0.0056 FFC= 0.0032 BMB= 0.0000 OCN= 0.0000 TBS= 0.0025
-42.5	NET=-0.0033 FFC= 0.0000 BMB= 0.0000 OCN=-0.0033 TBS= 0.0000	NET=-0.0191 FFC= 0.0000 BMB= 0.0000 OCN=-0.0191 TBS= 0.0000	NET=-0.0196 FFC= 0.0000 BMB= 0.0000 OCN=-0.0196 TBS= 0.0000	NET=-0.0047 FFC= 0.0012 BMB= 0.0000 OCN=-0.0059 TBS= 0.0000	NET= 0.0106 FFC= 0.0083 BMB= 0.0000 OCN= 0.0000 TBS= 0.0022	NET= 0.0052 FFC= 0.0012 BMB= 0.0000 OCN=-0.0004 TBS= 0.0044
-47.5	NET=-0.0075 FFC= 0.0000 BMB= 0.0000 OCN=-0.0075 TBS= 0.0000	NET=-0.0288 FFC= 0.0000 BMB= 0.0000 OCN=-0.0288 TBS= 0.0000	NET=-0.0026 FFC= 0.0000 BMB= 0.0000 OCN=-0.0026 TBS= 0.0000	NET=-0.0032 FFC= 0.0020 BMB= 0.0000 OCN=-0.0052 TBS=-0.0001	NET=-0.0002 FFC= 0.0013 BMB= 0.0000 OCN=-0.0064 TBS= 0.0050	NET=-0.0036 FFC= 0.0000 BMB= 0.0000 OCN=-0.0040 TBS= 0.0005
-52.5	NET=-0.0297 FFC= 0.0000 BMB= 0.0000 OCN=-0.0297 TBS= 0.0000	NET=-0.0436 FFC= 0.0000 BMB= 0.0000 OCN=-0.0436 TBS= 0.0000	NET=-0.0686 FFC= 0.0000 BMB= 0.0000 OCN=-0.0686 TBS= 0.0000	NET=-0.0048 FFC= 0.0000 BMB= 0.0000 OCN=-0.0048 TBS= 0.0000	NET=-0.0666 FFC= 0.0000 BMB= 0.0000 OCN=-0.0667 TBS= 0.0001	NET=-0.0206 FFC= 0.0000 BMB= 0.0000 OCN=-0.0206 TBS= 0.0000
-57.5	NET=-0.0049 FFC= 0.0000 BMB= 0.0000 OCN=-0.0049 TBS= 0.0000	NET=-0.0049 FFC= 0.0000 BMB= 0.0000 OCN=-0.0049 TBS= 0.0000	NET=-0.0099 FFC= 0.0000 BMB= 0.0000 OCN=-0.0099 TBS= 0.0000	NET=-0.0046 FFC= 0.0000 BMB= 0.0000 OCN=-0.0046 TBS= 0.0000	NET=-0.0014 FFC= 0.0000 BMB= 0.0000 OCN=-0.0014 TBS= 0.0000	NET=-0.0266 FFC= 0.0000 BMB= 0.0000 OCN=-0.0266 TBS= 0.0000
-62.5	NET=-0.0011 FFC= 0.0000 BMB= 0.0000 OCN=-0.0011 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0021 FFC= 0.0000 BMB= 0.0000 OCN=-0.0021 TBS= 0.0000	NET=-0.0182 FFC= 0.0000 BMB= 0.0000 OCN=-0.0182 TBS= 0.0000
-67.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-72.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-77.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-82.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
-87.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000

Figure 10.29 Monthly Average Fluxes for March
(122.5, 177.5)x(-27.5, 27.5) (longitude)x(latitude)

	122.5	127.5	132.5	137.5	142.5	147.5	152.5	157.5	162.5	167.5	172.5	177.5
27.5	NET= 0.0517 FFC= 0.0446 BMB= 0.0000 OCN= 0.0000 TBS= 0.0071	NET= 0.0005 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0006	NET= 0.0019 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0019	NET= 0.0019 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0019	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000
22.5	NET= 0.0758 FFC= 0.0745 BMB= 0.0000 OCN= 0.0000 TBS= 0.0013	NET= 0.0631 FFC= 0.0000 BMB= 0.0632 OCN= 0.0000 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000
17.5	NET= 0.0067 FFC= 0.0081 BMB= 0.0000 OCN= 0.0000 TBS=-0.0024	NET= 0.0473 FFC= 0.0000 BMB= 0.0474 OCN= 0.0000 TBS= 0.0000	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000
12.5	NET= 0.0648 FFC= 0.0087 BMB= 0.0632 OCN= 0.0000 TBS=-0.0071	NET= 0.0614 FFC= 0.0000 BMB= 0.0632 OCN= 0.0000 TBS=-0.0017	NET= 0.0001 FFC= 0.0000 BMB= 0.0000 OCN= 0.0001 TBS= 0.0000	NET= 0.0001 FFC= 0.0000 BMB= 0.0000 OCN= 0.0001 TBS= 0.0000	NET= 0.0013 FFC= 0.0011 BMB= 0.0000 OCN= 0.0002 TBS= 0.0000	NET= 0.0017 FFC= 0.0000 BMB= 0.0000 OCN= 0.0017 TBS= 0.0000	NET= 0.0036 FFC= 0.0000 BMB= 0.0000 OCN= 0.0036 TBS= 0.0000	NET= 0.0030 FFC= 0.0000 BMB= 0.0000 OCN= 0.0030 TBS= 0.0000	NET= 0.0018 FFC= 0.0000 BMB= 0.0000 OCN= 0.0018 TBS= 0.0000	NET= 0.0048 FFC= 0.0000 BMB= 0.0000 OCN= 0.0048 TBS= 0.0000	NET= 0.0009 FFC= 0.0000 BMB= 0.0000 OCN= 0.0009 TBS= 0.0000	NET= 0.0034 FFC= 0.0000 BMB= 0.0000 OCN= 0.0034 TBS= 0.0000
7.5	NET= 0.0048 FFC= 0.0078 BMB= 0.0000 OCN= 0.0000 TBS=-0.0029	NET=-0.0086 FFC= 0.0056 BMB= 0.0000 OCN= 0.0000 TBS=-0.0141	NET= 0.0004 FFC= 0.0000 BMB= 0.0000 OCN= 0.0004 TBS= 0.0000	NET= 0.0001 FFC= 0.0000 BMB= 0.0000 OCN= 0.0001 TBS= 0.0000	NET= 0.0216 FFC= 0.0000 BMB= 0.0000 OCN= 0.0216 TBS= 0.0000	NET= 0.0234 FFC= 0.0000 BMB= 0.0000 OCN= 0.0234 TBS= 0.0000	NET= 0.0282 FFC= 0.0000 BMB= 0.0000 OCN= 0.0282 TBS= 0.0000	NET= 0.0366 FFC= 0.0000 BMB= 0.0000 OCN= 0.0366 TBS= 0.0000	NET= 0.0100 FFC= 0.0000 BMB= 0.0000 OCN= 0.0100 TBS= 0.0000	NET= 0.0123 FFC= 0.0000 BMB= 0.0000 OCN= 0.0123 TBS= 0.0000	NET= 0.0112 FFC= 0.0000 BMB= 0.0000 OCN= 0.0112 TBS= 0.0000	NET= 0.0116 FFC= 0.0000 BMB= 0.0000 OCN= 0.0116 TBS= 0.0000
2.5	NET=-0.0616 FFC= 0.0030 BMB= 0.0000 OCN= 0.0000 TBS=-0.0646	NET= 0.0032 FFC= 0.0012 BMB= 0.0000 OCN= 0.0000 TBS= 0.0020	NET= 0.0006 FFC= 0.0000 BMB= 0.0000 OCN= 0.0006 TBS= 0.0000	NET= 0.0001 FFC= 0.0000 BMB= 0.0000 OCN= 0.0001 TBS= 0.0000	NET= 0.0073 FFC= 0.0000 BMB= 0.0000 OCN= 0.0073 TBS= 0.0000	NET= 0.0185 FFC= 0.0000 BMB= 0.0000 OCN= 0.0185 TBS= 0.0000	NET= 0.0080 FFC= 0.0000 BMB= 0.0000 OCN= 0.0080 TBS= 0.0000	NET= 0.0272 FFC= 0.0000 BMB= 0.0000 OCN= 0.0272 TBS= 0.0000	NET= 0.0206 FFC= 0.0000 BMB= 0.0000 OCN= 0.0206 TBS= 0.0000	NET= 0.0007 FFC= 0.0000 BMB= 0.0000 OCN= 0.0007 TBS= 0.0000	NET= 0.0206 FFC= 0.0000 BMB= 0.0000 OCN= 0.0206 TBS= 0.0000	NET= 0.0037 FFC= 0.0000 BMB= 0.0000 OCN= 0.0037 TBS= 0.0000
-2.5	NET=-0.0661 FFC= 0.0036 BMB= 0.0000 OCN= 0.0000 TBS=-0.0687	NET= 0.0046 FFC= 0.0012 BMB= 0.0000 OCN= 0.0000 TBS= 0.0034	NET=-0.0024 FFC= 0.0030 BMB= 0.0000 OCN= 0.0000 TBS=-0.0054	NET=-0.0086 FFC= 0.0030 BMB= 0.0000 OCN= 0.0006 TBS=-0.0120	NET=-0.0058 FFC= 0.0003 BMB= 0.0000 OCN= 0.0044 TBS=-0.0104	NET=-0.0012 FFC= 0.0001 BMB= 0.0000 OCN= 0.0001 TBS=-0.0014	NET= 0.0670 FFC= 0.0001 BMB= 0.0632 OCN= 0.0040 TBS=-0.0003	NET= 0.0060 FFC= 0.0000 BMB= 0.0000 OCN= 0.0060 TBS= 0.0000	NET= 0.0078 FFC= 0.0000 BMB= 0.0000 OCN= 0.0078 TBS= 0.0000	NET= 0.0002 FFC= 0.0001 BMB= 0.0000 OCN= 0.0001 TBS= 0.0000	NET= 0.0004 FFC= 0.0000 BMB= 0.0000 OCN= 0.0004 TBS= 0.0000	NET= 0.0012 FFC= 0.0000 BMB= 0.0000 OCN= 0.0012 TBS= 0.0000
-7.5	NET=-0.0026 FFC= 0.0012 BMB= 0.0000 OCN= 0.0000 TBS=-0.0038	NET= 0.0015 FFC= 0.0012 BMB= 0.0000 OCN= 0.0000 TBS= 0.0003	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN= 0.0014 TBS=-0.0020	NET=-0.0073 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS=-0.0073	NET=-0.0223 FFC= 0.0013 BMB= 0.0000 OCN= 0.0000 TBS=-0.0236	NET=-0.0282 FFC= 0.0007 BMB= 0.0000 OCN= 0.0000 TBS=-0.0290	NET=-0.0061 FFC= 0.0001 BMB= 0.0000 OCN= 0.0000 TBS=-0.0063	NET= 0.0002 FFC= 0.0001 BMB= 0.0000 OCN= 0.0002 TBS= 0.0000	NET= 0.0002 FFC= 0.0001 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0006 FFC= 0.0000 BMB= 0.0000 OCN= 0.0006 TBS= 0.0000	NET= 0.0064 FFC= 0.0000 BMB= 0.0000 OCN= 0.0064 TBS= 0.0000	NET= 0.0063 FFC= 0.0000 BMB= 0.0000 OCN= 0.0063 TBS= 0.0000
-12.5	NET=-0.0036 FFC= 0.0000 BMB= 0.0000 OCN=-0.0008 TBS=-0.0029	NET=-0.0033 FFC= 0.0001 BMB= 0.0000 OCN= 0.0000 TBS=-0.0034	NET=-0.0055 FFC= 0.0003 BMB= 0.0000 OCN= 0.0002 TBS=-0.0063	NET=-0.0034 FFC= 0.0001 BMB= 0.0000 OCN= 0.0000 TBS=-0.0035	NET=-0.0045 FFC= 0.0010 BMB= 0.0000 OCN= 0.0000 TBS=-0.0056	NET=-0.0067 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS=-0.0067	NET=-0.0010 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS=-0.0006	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0008 FFC= 0.0000 BMB= 0.0000 OCN=-0.0008 TBS= 0.0000	NET=-0.0012 FFC= 0.0000 BMB= 0.0000 OCN=-0.0012 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000
-17.5	NET=-0.0018 FFC= 0.0003 BMB= 0.0000 OCN=-0.0016 TBS=-0.0006	NET=-0.0096 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS=-0.0102	NET=-0.0105 FFC= 0.0003 BMB= 0.0000 OCN= 0.0000 TBS=-0.0108	NET=-0.0116 FFC= 0.0010 BMB= 0.0000 OCN= 0.0000 TBS=-0.0125	NET=-0.0159 FFC= 0.0026 BMB= 0.0000 OCN= 0.0000 TBS=-0.0185	NET=-0.0155 FFC= 0.0007 BMB= 0.0000 OCN= 0.0000 TBS=-0.0162	NET=-0.0011 FFC= 0.0000 BMB= 0.0000 OCN=-0.0010 TBS=-0.0001	NET=-0.0044 FFC= 0.0000 BMB= 0.0000 OCN=-0.0044 TBS= 0.0000	NET=-0.0012 FFC= 0.0000 BMB= 0.0000 OCN=-0.0012 TBS= 0.0000	NET=-0.0008 FFC= 0.0000 BMB= 0.0000 OCN=-0.0008 TBS= 0.0000	NET=-0.0009 FFC= 0.0000 BMB= 0.0000 OCN=-0.0009 TBS= 0.0000	NET= 0.0003 FFC= 0.0005 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000
-22.5	NET= 0.0028 FFC= 0.0003 BMB= 0.0000 OCN= 0.0000 TBS= 0.0024	NET=-0.0023 FFC= 0.0001 BMB= 0.0000 OCN= 0.0000 TBS=-0.0024	NET= 0.0002 FFC= 0.0004 BMB= 0.0000 OCN= 0.0000 TBS=-0.0002	NET=-0.0021 FFC= 0.0013 BMB= 0.0000 OCN= 0.0000 TBS=-0.0035	NET=-0.0211 FFC= 0.0029 BMB= 0.0000 OCN= 0.0000 TBS=-0.0240	NET=-0.0163 FFC= 0.0026 BMB= 0.0000 OCN= 0.0000 TBS=-0.0189	NET=-0.0102 FFC= 0.0005 BMB= 0.0000 OCN= 0.0000 TBS=-0.0107	NET=-0.0082 FFC= 0.0000 BMB= 0.0000 OCN=-0.0082 TBS= 0.0000	NET=-0.0008 FFC= 0.0000 BMB= 0.0000 OCN=-0.0008 TBS= 0.0000	NET= 0.0007 FFC= 0.0014 BMB= 0.0000 OCN=-0.0007 TBS= 0.0000	NET=-0.0016 FFC= 0.0000 BMB= 0.0000 OCN=-0.0016 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BMB= 0.0000 OCN=-0.0006 TBS= 0.0000
-27.5	NET= 0.0113 FFC= 0.0006 BMB= 0.0000 OCN= 0.0000 TBS= 0.0106	NET= 0.0030 FFC= 0.0003 BMB= 0.0000 OCN= 0.0000 TBS= 0.0027	NET= 0.0025 FFC= 0.0013 BMB= 0.0000 OCN= 0.0000 TBS= 0.0012	NET=-0.0025 FFC= 0.0012 BMB= 0.0000 OCN= 0.0000 TBS=-0.0037	NET=-0.0002 FFC= 0.0036 BMB= 0.0000 OCN= 0.0000 TBS=-0.0038	NET= 0.0034 FFC= 0.0039 BMB= 0.0000 OCN= 0.0000 TBS=-0.0005	NET= 0.0154 FFC= 0.0199 BMB= 0.0000 OCN= 0.0000 TBS=-0.0046	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0028 FFC= 0.0000 BMB= 0.0000 OCN=-0.0028 TBS= 0.0000	NET=-0.0047 FFC= 0.0000 BMB= 0.0000 OCN=-0.0047 TBS= 0.0000	NET=-0.0013 FFC= 0.0000 BMB= 0.0000 OCN=-0.0013 TBS= 0.0000	NET=-0.0018 FFC= 0.0000 BMB= 0.0000 OCN=-0.0018 TBS= 0.0000

Figure 10.30 Monthly Average Fluxes for March
(122.5, 177.5)x(32.5, 87.5) (longitude)x(latitude)

	122.5	127.5	132.5	137.5	142.5	147.5	152.5	157.5	162.5	167.5	172.5	177.5
87.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
82.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
77.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
72.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0046 FFC= 0.0046 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0068 FFC= 0.0068 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0113 FFC= 0.0113 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
67.5	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0249 FFC= 0.0249 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0090 FFC= 0.0090 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0158 FFC= 0.0158 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0248 FFC= 0.0248 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0317 FFC= 0.0317 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0136 FFC= 0.0136 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0158 FFC= 0.0158 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0158 FFC= 0.0158 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0045 FFC= 0.0045 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0249 FFC= 0.0249 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000
62.5	NET= 0.0203 FFC= 0.0203 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0294 FFC= 0.0294 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0181 FFC= 0.0181 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0068 FFC= 0.0068 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0181 FFC= 0.0181 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0158 FFC= 0.0158 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0113 FFC= 0.0113 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0069 FFC= 0.0068 BMB= 0.0000 OCN= 0.0000 TBS= 0.0002
57.5	NET= 0.0045 FFC= 0.0045 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0136 FFC= 0.0136 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0090 FFC= 0.0090 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0068 FFC= 0.0068 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0068 FFC= 0.0068 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0047 FFC= 0.0045 BMB= 0.0000 OCN= 0.0000 TBS= 0.0002	NET= 0.0023 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0048 FFC= 0.0045 BMB= 0.0000 OCN= 0.0000 TBS= 0.0003	NET= 0.0033 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0011	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0064 FFC= 0.0000 BMB= 0.0000 OCN= 0.0064 TBS= 0.0000	NET= 0.0029 FFC= 0.0000 BMB= 0.0000 OCN= 0.0024 TBS= 0.0006
52.5	NET= 0.0028 FFC= 0.0028 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0204 FFC= 0.0203 BMB= 0.0000 OCN= 0.0000 TBS= 0.0001	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0045 FFC= 0.0045 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0090 FFC= 0.0090 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0002 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0002	NET= 0.0001 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0001	NET= 0.0083 FFC= 0.0068 BMB= 0.0000 OCN= 0.0000 TBS= 0.0015	NET= 0.0086 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0086	NET= 0.0119 FFC= 0.0000 BMB= 0.0000 OCN= 0.0119 TBS= 0.0000	NET= 0.0166 FFC= 0.0000 BMB= 0.0000 OCN= 0.0166 TBS= 0.0000	NET= 0.0138 FFC= 0.0000 BMB= 0.0000 OCN= 0.0138 TBS= 0.0000
47.5	NET= 0.0182 FFC= 0.0189 BMB= 0.0000 OCN= 0.0000 TBS=-0.0007	NET= 0.0479 FFC= 0.0465 BMB= 0.0000 OCN= 0.0000 TBS= 0.0014	NET= 0.0392 FFC= 0.0368 BMB= 0.0000 OCN= 0.0000 TBS= 0.0024	NET= 0.0183 FFC= 0.0169 BMB= 0.0000 OCN= 0.0000 TBS= 0.0014	NET= 0.0129 FFC= 0.0090 BMB= 0.0000 OCN= 0.0000 TBS= 0.0039	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0029 FFC= 0.0000 BMB= 0.0000 OCN= 0.0029 TBS= 0.0000	NET= 0.0034 FFC= 0.0000 BMB= 0.0000 OCN= 0.0026 TBS= 0.0007	NET= 0.0043 FFC= 0.0000 BMB= 0.0000 OCN= 0.0022 TBS= 0.0022	NET= 0.0110 FFC= 0.0000 BMB= 0.0000 OCN= 0.0110 TBS= 0.0000	NET= 0.0066 FFC= 0.0000 BMB= 0.0000 OCN= 0.0066 TBS= 0.0000	NET= 0.0011 FFC= 0.0000 BMB= 0.0000 OCN= 0.0011 TBS= 0.0000
42.5	NET= 0.0833 FFC= 0.0842 BMB= 0.0000 OCN= 0.0000 TBS= 0.0011	NET= 0.1260 FFC= 0.1236 BMB= 0.0000 OCN= 0.0000 TBS= 0.0025	NET= 0.0506 FFC= 0.0411 BMB= 0.0000 OCN= 0.0000 TBS= 0.0096	NET= 0.0056 FFC= 0.0023 BMB= 0.0000 OCN= 0.0000 TBS= 0.0036	NET= 0.2066 FFC= 0.2031 BMB= 0.0000 OCN= 0.0000 TBS= 0.0057	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0117 FFC= 0.0000 BMB= 0.0000 OCN= 0.0117 TBS= 0.0000	NET= 0.0167 FFC= 0.0000 BMB= 0.0000 OCN= 0.0167 TBS= 0.0000	NET= 0.0089 FFC= 0.0000 BMB= 0.0000 OCN= 0.0089 TBS= 0.0000	NET= 0.0030 FFC= 0.0000 BMB= 0.0000 OCN= 0.0030 TBS= 0.0000	NET= 0.0067 FFC= 0.0000 BMB= 0.0000 OCN= 0.0067 TBS= 0.0000	NET= 0.0207 FFC= 0.0000 BMB= 0.0000 OCN= 0.0207 TBS= 0.0000
37.5	NET= 0.0634 FFC= 0.0499 BMB= 0.0000 OCN= 0.0000 TBS= 0.0135	NET= 0.2823 FFC= 0.2509 BMB= 0.0000 OCN= 0.0000 TBS= 0.0114	NET= 0.0401 FFC= 0.0316 BMB= 0.0000 OCN= 0.0000 TBS= 0.0085	NET= 0.3450 FFC= 0.3437 BMB= 0.0000 OCN= 0.0000 TBS= 0.0013	NET= 0.1190 FFC= 0.1065 BMB= 0.0000 OCN= 0.0000 TBS= 0.0125	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0094 FFC= 0.0000 BMB= 0.0000 OCN= 0.0094 TBS= 0.0000	NET= 0.0080 FFC= 0.0000 BMB= 0.0000 OCN= 0.0080 TBS= 0.0000	NET= 0.0129 FFC= 0.0000 BMB= 0.0000 OCN= 0.0129 TBS= 0.0000	NET= 0.0030 FFC= 0.0000 BMB= 0.0000 OCN= 0.0030 TBS= 0.0000	NET= 0.0086 FFC= 0.0000 BMB= 0.0000 OCN= 0.0086 TBS= 0.0000	NET= 0.0104 FFC= 0.0000 BMB= 0.0000 OCN= 0.0104 TBS= 0.0000
32.5	NET= 0.0874 FFC= 0.0782 BMB= 0.0000 OCN= 0.0000 TBS= 0.0083	NET= 0.0160 FFC= 0.0108 BMB= 0.0000 OCN= 0.0000 TBS= 0.0052	NET= 0.2167 FFC= 0.2106 BMB= 0.0000 OCN= 0.0000 TBS= 0.0061	NET= 0.0898 FFC= 0.0816 BMB= 0.0000 OCN= 0.0000 TBS= 0.0079	NET= 0.0061 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0061	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BMB= 0.0000 OCN= 0.0000 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BMB= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BMB= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0003 FFC= 0.0000 BMB= 0.0000 OCN=-0.0003 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BMB= 0.0000 OCN=-0.0001 TBS= 0.0000

Figure 10.31 Monthly Average Fluxes for September
(-177.5,-122.5)x(-87.5, -32.5) (longitude)x(latitude)

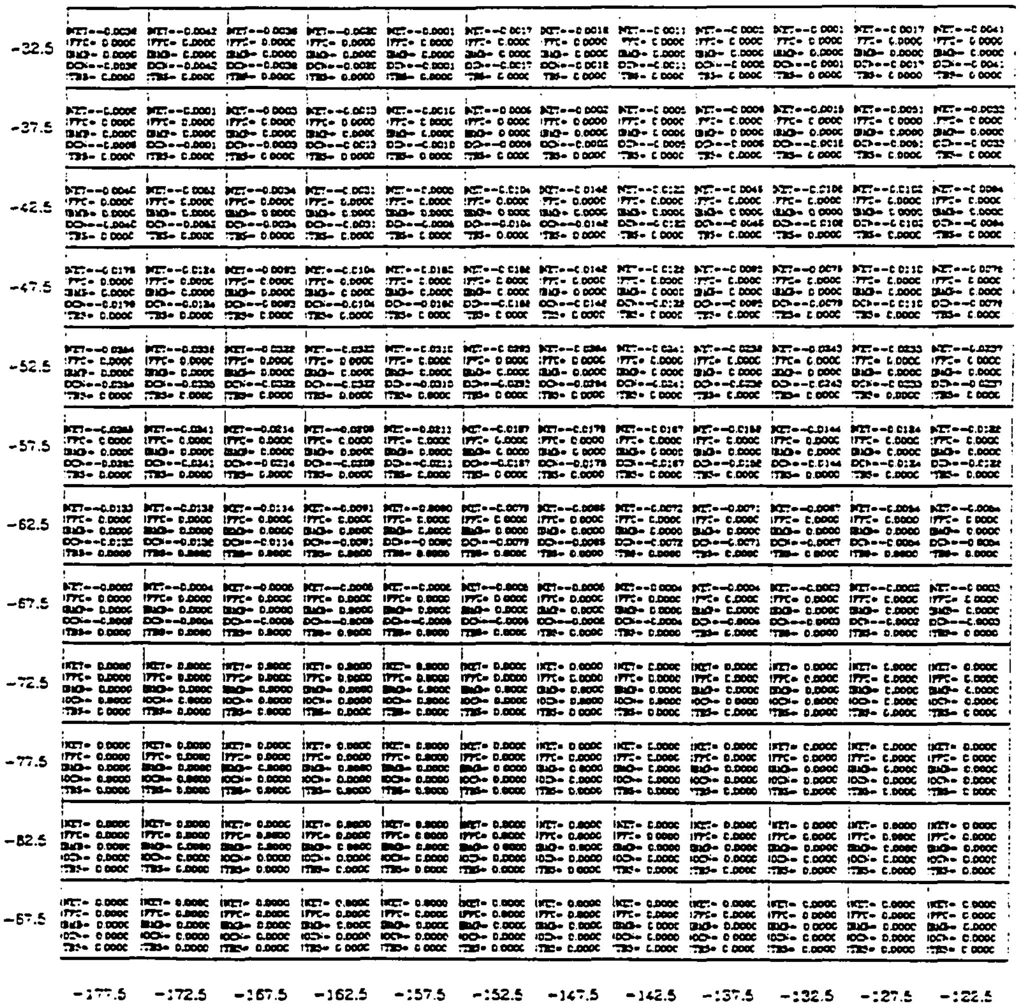

Figure 10.32 Monthly Average Fluxes for September
(-177.5, -122.5)x(-27.5, 27.5) (longitude)x(latitude)

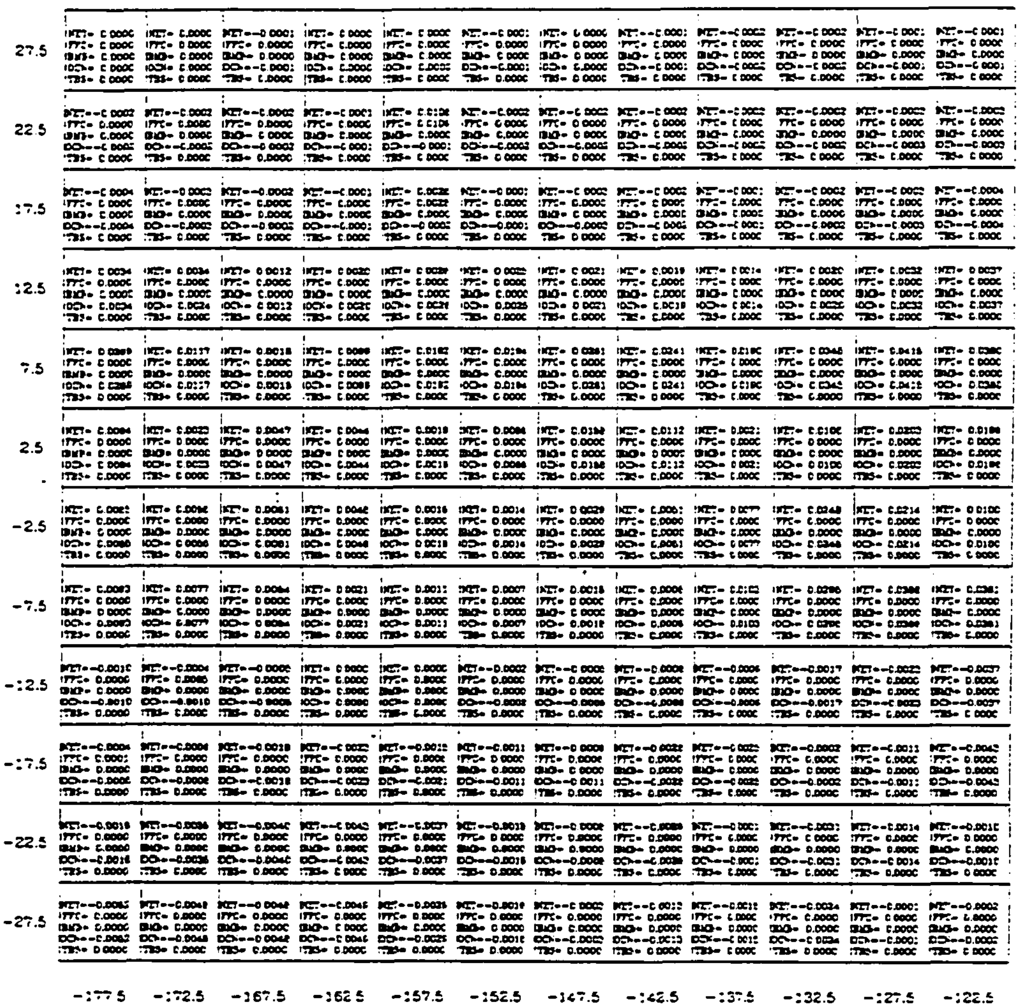

Figure 10.33 Monthly Average Fluxes for September
(-177.5, -122.5)x(32.5, 87.5) (longitude)x(latitude)

	-177.5	-172.5	-167.5	-162.5	-157.5	-152.5	-147.5	-142.5	-137.5	-132.5	-127.5	-122.5
87.5	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000
82.5	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000
77.5	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000
72.5	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001	INT= 0.0002 FFC= 0.0002 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0001 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0001 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001	INT= 0.0001 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001
67.5	INT= 0.0194 FFC= 0.0194 BIO= 0.0000 OCN= 0.0000 TBS= -0.0002	INT= 0.0046 FFC= 0.0046 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0028 FFC= 0.0014 BIO= 0.0000 OCN= 0.0000 TBS= 0.0015	INT= 0.0084 FFC= 0.0010 BIO= 0.0000 OCN= 0.0000 TBS= 0.0084	INT= 0.0101 FFC= 0.0022 BIO= 0.0000 OCN= 0.0000 TBS= 0.0079	INT= 0.0098 FFC= 0.0021 BIO= 0.0000 OCN= 0.0000 TBS= 0.0076	INT= 0.0084 FFC= 0.0018 BIO= 0.0000 OCN= 0.0000 TBS= 0.0076	INT= 0.0074 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0074	INT= 0.0067 FFC= 0.0003 BIO= 0.0000 OCN= 0.0000 TBS= 0.0064	INT= 0.0089 FFC= 0.0001 BIO= 0.0000 OCN= 0.0000 TBS= 0.0088	INT= 0.0041 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0041
62.5	INT= -0.0022 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= -0.0022	INT= 0.0032 FFC= 0.0020 BIO= 0.0000 OCN= 0.0000 TBS= 0.0012	INT= 0.0001 FFC= 0.0002 BIO= 0.0000 OCN= 0.0000 TBS= -0.0001	INT= 0.0038 FFC= 0.0015 BIO= 0.0000 OCN= 0.0000 TBS= 0.0023	INT= 0.0094 FFC= 0.0013 BIO= 0.0000 OCN= 0.0000 TBS= 0.0081	INT= 0.0182 FFC= 0.0006 BIO= 0.0000 OCN= 0.0000 TBS= 0.0176	INT= 0.0636 FFC= 0.0330 BIO= 0.0000 OCN= 0.0000 TBS= 0.0306	INT= 0.0304 FFC= 0.0014 BIO= 0.0000 OCN= 0.0000 TBS= 0.0291	INT= 0.0237 FFC= 0.0006 BIO= 0.0000 OCN= 0.0000 TBS= 0.0232	INT= 0.0196 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0196	INT= 0.0196 FFC= 0.0001 BIO= 0.0000 OCN= 0.0000 TBS= 0.0195	INT= 0.0146 FFC= 0.0001 BIO= 0.0000 OCN= 0.0000 TBS= 0.0145
57.5	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0001 TBS= -0.0001	INT= 0.0065 FFC= 0.0000 BIO= 0.0000 OCN= 0.0064 TBS= 0.0001	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= -0.0016 FFC= 0.0002 BIO= 0.0000 OCN= 0.0000 TBS= -0.0018	INT= -0.0044 FFC= 0.0006 BIO= 0.0000 OCN= 0.0000 TBS= -0.0050	INT= -0.0057 FFC= 0.0008 BIO= 0.0000 OCN= 0.0000 TBS= -0.0065	INT= 0.0074 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0074	INT= 0.0102 FFC= 0.0000 BIO= 0.0000 OCN= 0.0078 TBS= 0.0024	INT= 0.0100 FFC= 0.0011 BIO= 0.0000 OCN= 0.0000 TBS= 0.0089	INT= 0.0148 FFC= 0.0032 BIO= 0.0000 OCN= 0.0000 TBS= 0.0116	INT= 0.0182 FFC= 0.0062 BIO= 0.0000 OCN= 0.0000 TBS= 0.0121	INT= 0.0106 FFC= 0.0024 BIO= 0.0000 OCN= 0.0000 TBS= 0.0082
52.5	INT= 0.0287 FFC= 0.0000 BIO= 0.0000 OCN= 0.0287 TBS= 0.0000	INT= 0.0284 FFC= 0.0000 BIO= 0.0000 OCN= 0.0284 TBS= 0.0000	INT= 0.0172 FFC= 0.0000 BIO= 0.0000 OCN= 0.0172 TBS= 0.0000	INT= 0.0004 FFC= 0.0000 BIO= 0.0000 OCN= 0.0007 TBS= -0.0003	INT= -0.0018 FFC= 0.0000 BIO= 0.0000 OCN= 0.0007 TBS= -0.0025	INT= 0.0176 FFC= 0.0000 BIO= 0.0000 OCN= 0.0194 TBS= -0.0019	INT= 0.0208 FFC= 0.0000 BIO= 0.0000 OCN= 0.0208 TBS= 0.0000	INT= 0.0341 FFC= 0.0000 BIO= 0.0000 OCN= 0.0341 TBS= 0.0000	INT= 0.0200 FFC= 0.0000 BIO= 0.0000 OCN= 0.0200 TBS= 0.0000	INT= -0.0034 FFC= 0.0002 BIO= 0.0000 OCN= 0.0007 TBS= -0.0043	INT= -0.0066 FFC= 0.0027 BIO= 0.0000 OCN= 0.0000 TBS= -0.0093	INT= 0.0078 FFC= 0.0065 BIO= 0.0000 OCN= 0.0000 TBS= 0.0013
47.5	INT= 0.0317 FFC= 0.0000 BIO= 0.0000 OCN= 0.0317 TBS= 0.0000	INT= 0.0332 FFC= 0.0000 BIO= 0.0000 OCN= 0.0332 TBS= 0.0000	INT= 0.0337 FFC= 0.0000 BIO= 0.0000 OCN= 0.0337 TBS= 0.0000	INT= 0.0383 FFC= 0.0000 BIO= 0.0000 OCN= 0.0384 TBS= -0.0001	INT= 0.0270 FFC= 0.0000 BIO= 0.0000 OCN= 0.0270 TBS= 0.0000	INT= 0.0368 FFC= 0.0000 BIO= 0.0000 OCN= 0.0368 TBS= 0.0000	INT= 0.0370 FFC= 0.0000 BIO= 0.0000 OCN= 0.0370 TBS= 0.0000	INT= 0.0369 FFC= 0.0000 BIO= 0.0000 OCN= 0.0369 TBS= 0.0000	INT= 0.0368 FFC= 0.0000 BIO= 0.0000 OCN= 0.0368 TBS= 0.0000	INT= 0.0266 FFC= 0.0000 BIO= 0.0000 OCN= 0.0272 TBS= -0.0006	INT= -0.0010 FFC= 0.0002 BIO= 0.0000 OCN= 0.0032 TBS= -0.0043	INT= 0.1024 FFC= 0.1099 BIO= 0.0000 OCN= 0.0000 TBS= -0.0075
42.5	INT= 0.0299 FFC= 0.0000 BIO= 0.0000 OCN= 0.0299 TBS= 0.0000	INT= 0.0304 FFC= 0.0000 BIO= 0.0000 OCN= 0.0304 TBS= 0.0000	INT= 0.0307 FFC= 0.0000 BIO= 0.0000 OCN= 0.0307 TBS= 0.0000	INT= 0.0301 FFC= 0.0000 BIO= 0.0000 OCN= 0.0301 TBS= 0.0000	INT= 0.0290 FFC= 0.0000 BIO= 0.0000 OCN= 0.0290 TBS= 0.0000	INT= 0.0284 FFC= 0.0000 BIO= 0.0000 OCN= 0.0284 TBS= 0.0000	INT= 0.0277 FFC= 0.0000 BIO= 0.0000 OCN= 0.0277 TBS= 0.0000	INT= 0.0278 FFC= 0.0000 BIO= 0.0000 OCN= 0.0278 TBS= 0.0000	INT= 0.0278 FFC= 0.0000 BIO= 0.0000 OCN= 0.0278 TBS= 0.0000	INT= 0.0280 FFC= 0.0000 BIO= 0.0000 OCN= 0.0280 TBS= 0.0000	INT= 0.0342 FFC= 0.0000 BIO= 0.0000 OCN= 0.0344 TBS= -0.0002	INT= 0.0078 FFC= 0.0128 BIO= 0.0000 OCN= 0.0000 TBS= -0.0049
37.5	INT= 0.0142 FFC= 0.0000 BIO= 0.0000 OCN= 0.0142 TBS= 0.0000	INT= 0.0136 FFC= 0.0000 BIO= 0.0000 OCN= 0.0136 TBS= 0.0000	INT= 0.0116 FFC= 0.0000 BIO= 0.0000 OCN= 0.0116 TBS= 0.0000	INT= 0.0102 FFC= 0.0000 BIO= 0.0000 OCN= 0.0102 TBS= 0.0000	INT= 0.0081 FFC= 0.0000 BIO= 0.0000 OCN= 0.0081 TBS= 0.0000	INT= 0.0081 FFC= 0.0000 BIO= 0.0000 OCN= 0.0081 TBS= 0.0000	INT= 0.0074 FFC= 0.0000 BIO= 0.0000 OCN= 0.0074 TBS= 0.0000	INT= 0.0080 FFC= 0.0000 BIO= 0.0000 OCN= 0.0080 TBS= 0.0000	INT= 0.0088 FFC= 0.0000 BIO= 0.0000 OCN= 0.0088 TBS= 0.0000	INT= 0.0088 FFC= 0.0000 BIO= 0.0000 OCN= 0.0088 TBS= 0.0000	INT= 0.0108 FFC= 0.0000 BIO= 0.0000 OCN= 0.0108 TBS= 0.0000	INT= 0.1013 FFC= 0.1056 BIO= 0.0000 OCN= 0.0000 TBS= -0.0042
32.5	INT= -0.0004 FFC= 0.0000 BIO= 0.0000 OCN= -0.0004 TBS= 0.0000	INT= -0.0002 FFC= 0.0000 BIO= 0.0000 OCN= -0.0002 TBS= 0.0000	INT= -0.0002 FFC= 0.0000 BIO= 0.0000 OCN= -0.0002 TBS= 0.0000	INT= -0.0001 FFC= 0.0000 BIO= 0.0000 OCN= -0.0001 TBS= 0.0000	INT= -0.0002 FFC= 0.0000 BIO= 0.0000 OCN= -0.0002 TBS= 0.0000	INT= -0.0001 FFC= 0.0000 BIO= 0.0000 OCN= -0.0001 TBS= 0.0000	INT= -0.0001 FFC= 0.0000 BIO= 0.0000 OCN= -0.0001 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= -0.0001 FFC= 0.0000 BIO= 0.0000 OCN= -0.0001 TBS= 0.0000	INT= -0.0001 FFC= 0.0000 BIO= 0.0000 OCN= -0.0001 TBS= 0.0000	INT= -0.0002 FFC= 0.0000 BIO= 0.0000 OCN= -0.0002 TBS= 0.0000	INT= -0.0004 FFC= 0.0000 BIO= 0.0000 OCN= -0.0002 TBS= -0.0002

Figure 10.34 Monthly Average Fluxes for September
(-117.5, -62.5)x(-87.5, -32.5) (longitude)x(latitude)

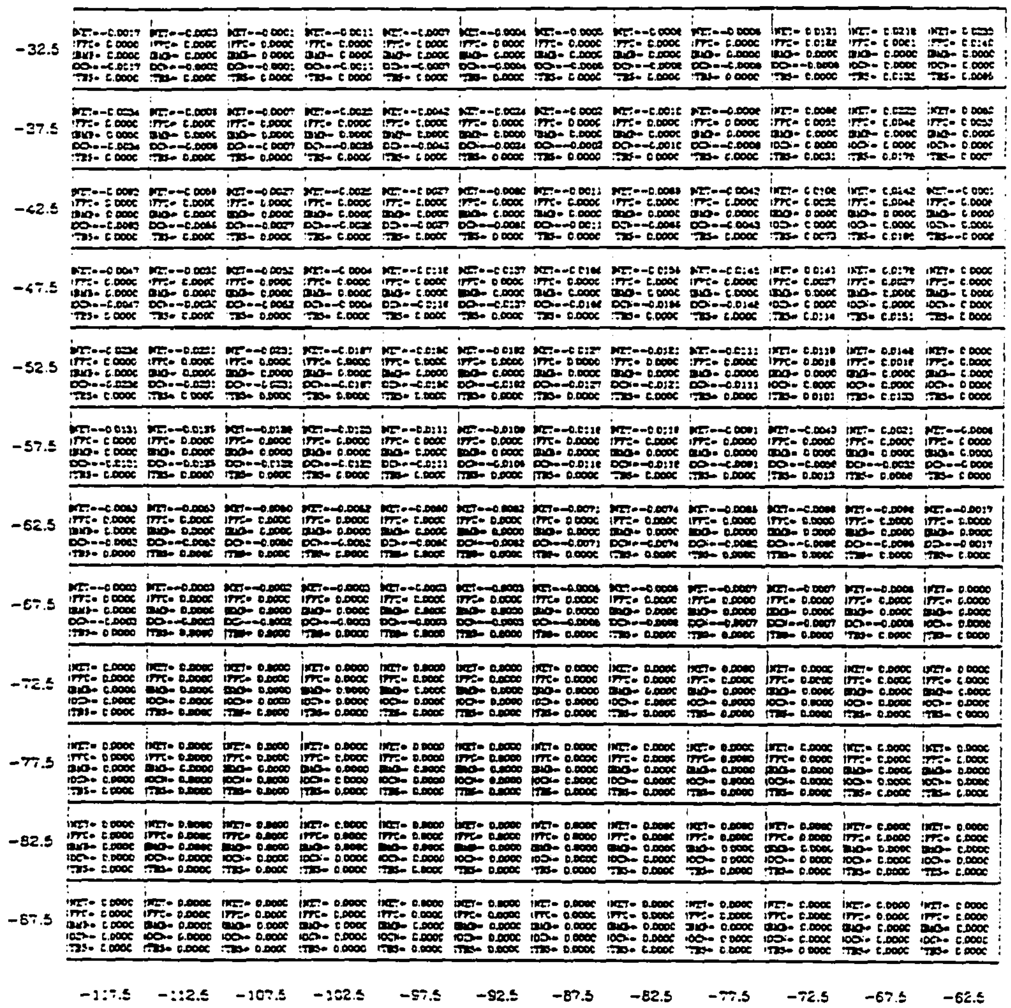

Figure 10.35 Monthly Average Fluxes for September
(-117.5, -62.5)x(-27.5, 27.5) (longitude)x(latitude)

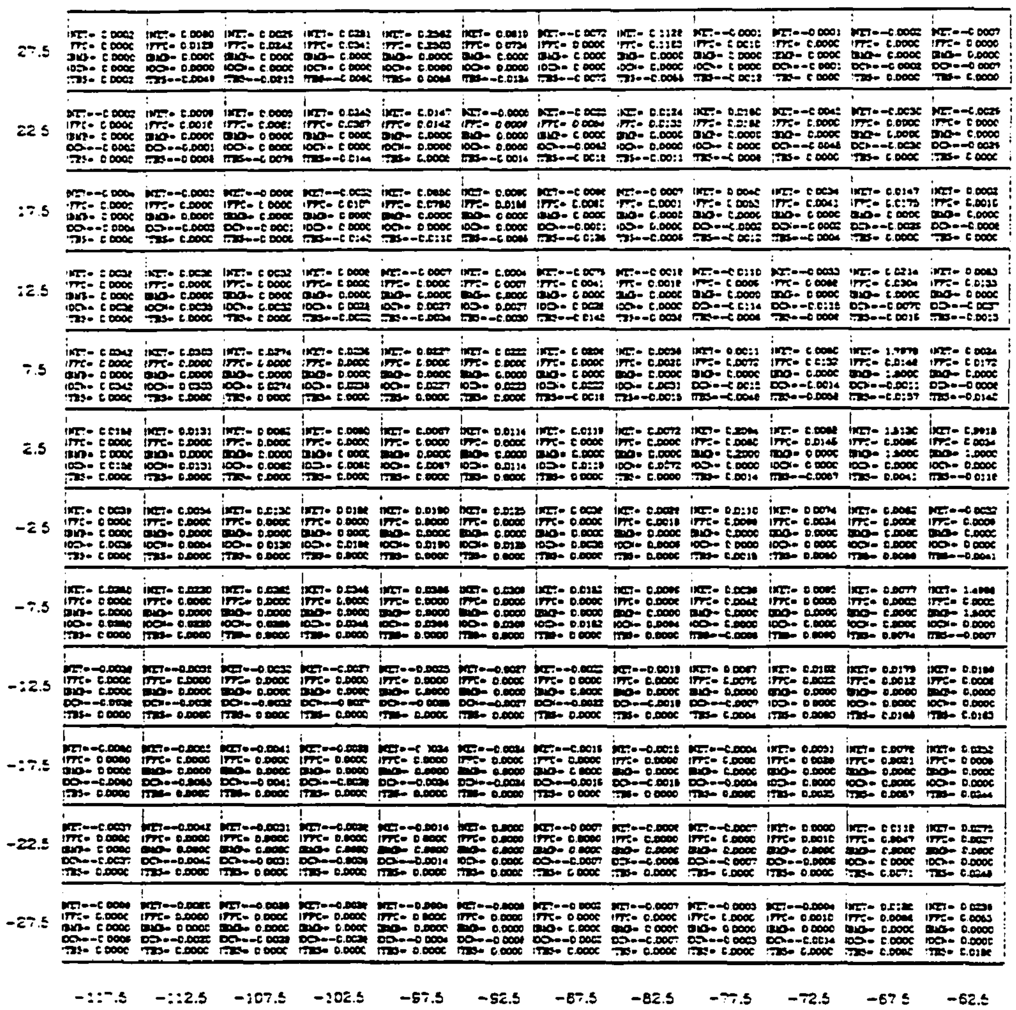

Figure 10.36 Monthly Average Fluxes for September
(-117.5, -62.5)x(32.5, 87.5) (longitude)x(latitude)

Latitude	Flux	-117.5	-112.5	-107.5	-102.5	-97.5	-92.5	-87.5	-82.5	-77.5	-72.5	-67.5	-62.5
87.5	NET=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BIO=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
82.5	NET=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BIO=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
77.5	NET=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BIO=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	TBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
72.5	NET=	0.0001	0.0000	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001	0.0022	0.0000	0.0000	0.0000
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BIO=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	TBS=	0.0001	0.0000	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001	0.0022	0.0000	0.0000	0.0000
67.5	NET=	0.0085	0.0004	0.0101	0.0091	0.0025	0.0080	0.0082	0.0118	0.0043	-0.0001	0.0000	0.0000
	FFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BIO=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	TBS=	0.0085	0.0004	0.0101	0.0091	0.0025	0.0080	0.0082	0.0118	0.0043	-0.0001	0.0000	0.0000
62.5	NET=	0.0082	0.0094	0.0102	0.0086	0.0047	0.0086	0.0148	0.0120	0.0006	-0.0024	0.0018	0.0000
	FFC=	0.0003	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BIO=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	TBS=	0.0079	0.0088	0.0103	0.0086	0.0047	0.0086	0.0148	0.0120	0.0006	-0.0024	0.0018	0.0000
57.5	NET=	0.0234	0.0298	0.0202	0.0108	0.0126	0.0062	0.0017	0.0008	-0.0001	-0.0043	0.0071	-0.0009
	FFC=	0.0064	0.0047	0.0015	0.0015	0.0016	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	BIO=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	TBS=	0.0170	0.0251	0.0187	0.0094	0.0109	0.0056	0.0017	0.0008	-0.0001	-0.0043	0.0071	-0.0009
52.5	NET=	0.0080	0.0627	0.0312	0.0290	0.0166	0.0258	0.0180	0.0085	0.0079	0.0042	0.0065	0.0039
	FFC=	0.0080	0.0388	0.0106	0.0083	0.0030	0.0043	0.0013	0.0005	0.0044	0.0008	0.0052	0.0036
	BIO=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	TBS=	0.0000	0.0238	[illegible]	0.0207	0.0131	0.0215	0.0166	0.0080	0.0035	0.0034	0.0012	0.0003
47.5	NET=	0.0136	0.0313	0.0318	0.0542	0.0709	0.0529	0.0568	0.0336	0.0379	0.0992	0.0136	-0.0120
	FFC=	0.0273	0.0152	0.0142	0.0326	0.0505	0.0401	0.0377	0.0188	0.0282	0.1028	0.0314	0.0120
	BIO=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	TBS=	-0.0133	0.0161	0.0172	0.0216	0.0204	0.0127	0.0192	0.0152	0.0097	-0.0036	-0.0178	-0.0238
42.5	NET=	0.0059	0.0389	0.0507	0.0509	0.0580	0.1110	0.3478	0.3118	0.4523	0.3988	-0.0032	-0.0136
	FFC=	0.0078	0.0436	0.0461	0.0362	0.0536	0.1210	0.3468	0.3071	0.4437	0.4002	0.0054	0.0088
	BIO=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0147
	TBS=	-0.0019	-0.0047	0.0046	0.0147	0.0044	-0.0101	0.0010	0.0044	0.0086	-0.0013	-0.0086	-0.0076
37.5	NET=	0.0315	0.0027	0.0146	0.0784	0.1210	0.1293	0.2960	0.3070	0.2721	0.0292	-0.0106	-0.0372
	FFC=	0.0480	0.0113	0.0322	0.0826	0.1262	0.1400	0.3106	0.3180	0.2750	0.0311	0.0000	0.0000
	BIO=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0104	-0.0371
	TBS=	-0.0136	-0.0086	-0.0176	-0.0041	-0.0051	-0.0107	-0.0146	-0.0110	-0.0028	-0.0019	-0.0002	-0.0001
32.5	NET=	0.1834	0.0466	-0.0004	0.0486	0.2321	0.1536	0.1406	0.1778	0.0171	-0.0006	-0.0116	-0.0120
	FFC=	0.1885	0.0575	0.0226	0.0847	0.2228	0.1688	0.1548	0.1883	0.0236	0.0000	0.0000	0.0000
	BIO=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	OCN=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0006	-0.0116	-0.0120
	TBS=	-0.0051	-0.0110	-0.0236	-0.0361	0.0092	-0.0153	-0.0142	-0.0105	-0.0064	0.0000	0.0000	0.0000

Figure 10.37 Monthly Average Fluxes for September
(-57.5, -2.5)x(-87.5, -32.5) (longitude)x(latitude)

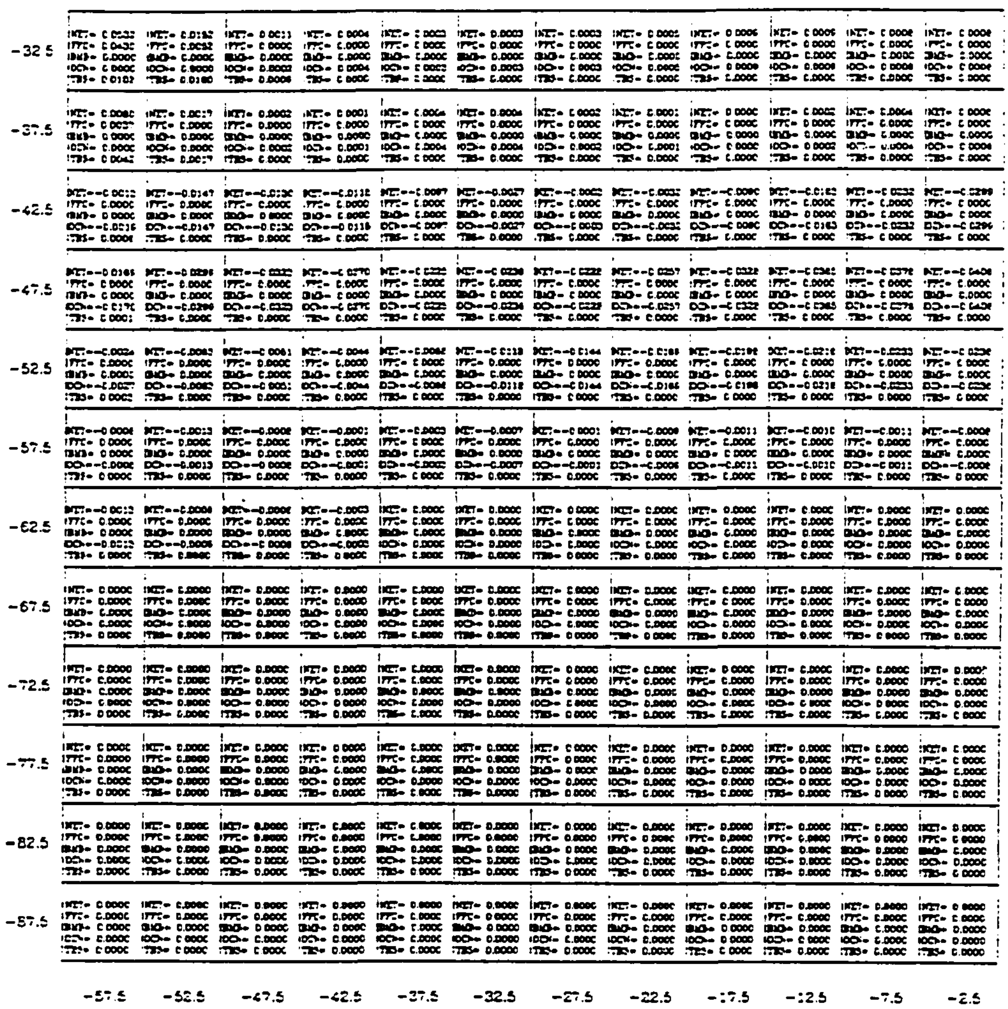

Figure 10.38 Monthly Average Fluxes for September (-57.5, -2.5)x(-27.5, 27.5) (longitude)x(latitude)

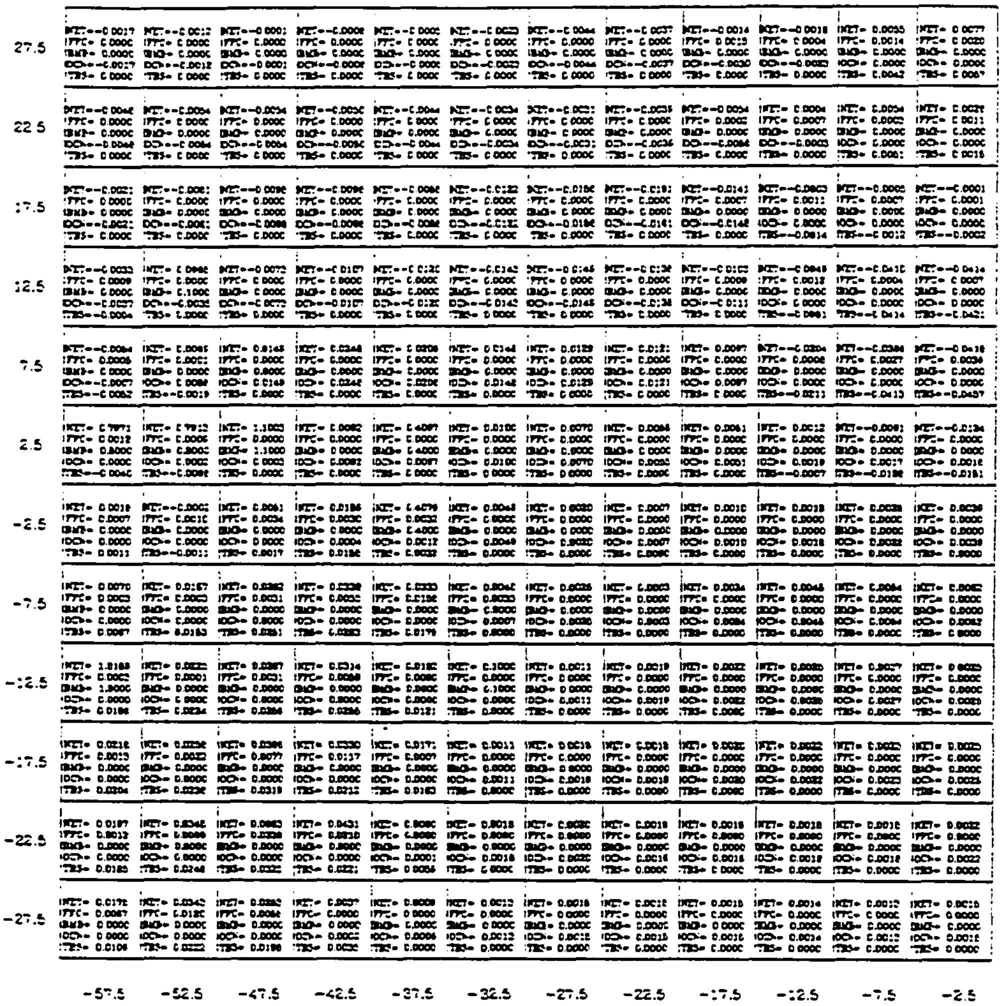

Figure 10.39 Monthly Average Fluxes for September
(-57.5, -2.5)x(32.5, 87.5) (longitude)x(latitude)

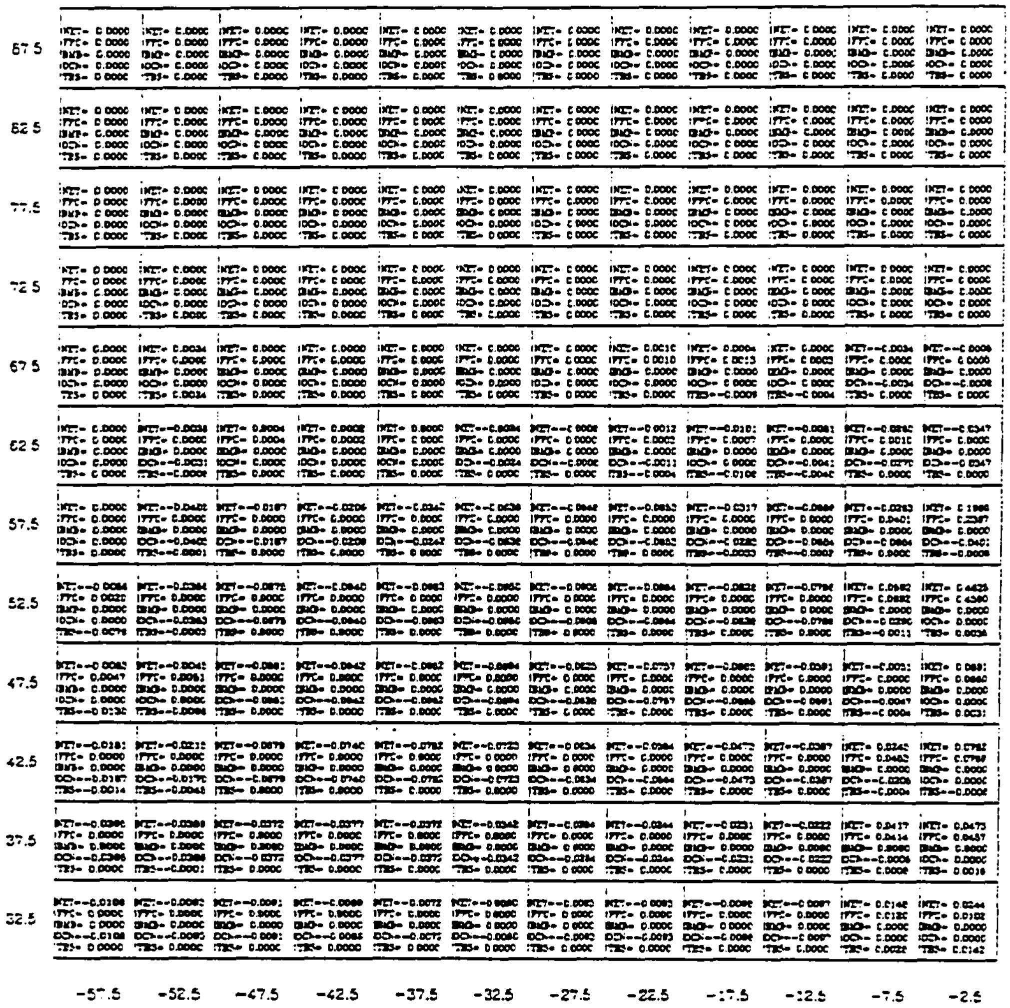

Figure 10.40 Monthly Average Fluxes for September
(2.5, 57.5)x(-87.5, -32.5) (longitude)x(latitude)

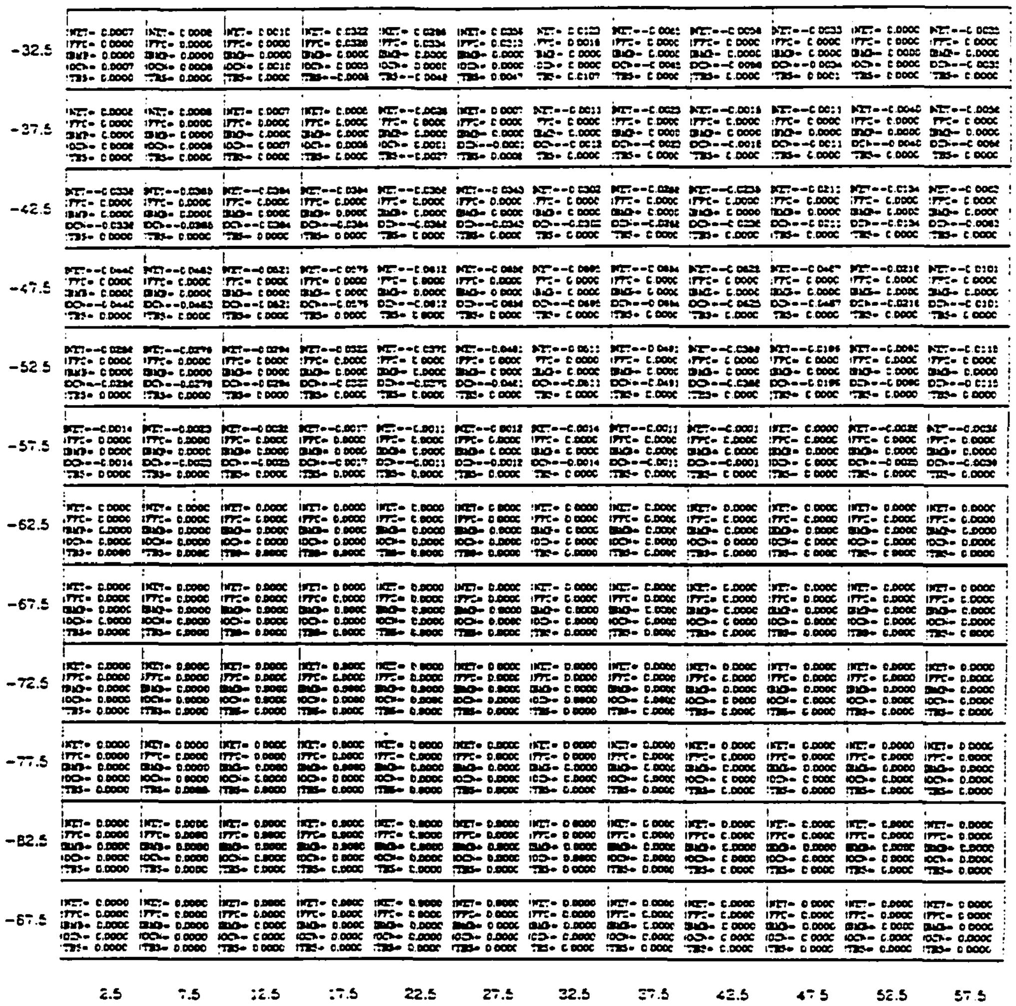

Figure 10.41 Monthly Average Fluxes for September
(2.5, 57.5)x(-27.5, 27.5) (longitude)x(latitude)

	2.5	7.5	12.5	17.5	22.5	27.5	32.5	37.5	42.5	47.5	52.5	57.5
27.5	NET= 0.0071 FFC= 0.0040 BIO= 0.0000 OCN= 0.0000 TBS= 0.0031	NET= 0.0080 FFC= 0.0058 BIO= 0.0000 OCN= 0.0000 TBS= 0.0023	NET= 0.0081 FFC= 0.0050 BIO= 0.0000 OCN= 0.0000 TBS= 0.0031	NET= 0.0074 FFC= 0.0036 BIO= 0.0000 OCN= 0.0000 TBS= 0.0036	NET= 0.0054 FFC= 0.0006 BIO= 0.0000 OCN= 0.0000 TBS= 0.0048	NET= 0.0102 FFC= 0.0070 BIO= 0.0000 OCN= 0.0000 TBS= 0.0032	NET= 0.0262 FFC= 0.0224 BIO= 0.0000 OCN= 0.0000 TBS= 0.0038	NET= 0.0188 FFC= 0.0128 BIO= 0.0000 OCN= 0.0000 TBS= 0.0060	NET= 0.0282 FFC= 0.0278 BIO= 0.0000 OCN= 0.0000 TBS= 0.0004	NET= 0.0580 FFC= 0.0548 BIO= 0.0000 OCN= 0.0000 TBS= 0.0032	NET= 0.0428 FFC= 0.0374 BIO= 0.0000 OCN= 0.0000 TBS= 0.0054	NET= 0.0210 FFC= 0.0204 BIO= 0.0000 OCN= 0.0000 TBS= 0.0006
22.5	NET= 0.0037 FFC= 0.0020 BIO= 0.0000 OCN= 0.0000 TBS= 0.0016	NET= 0.0081 FFC= 0.0066 BIO= 0.0000 OCN= 0.0000 TBS= 0.0015	NET= 0.0018 FFC= 0.0010 BIO= 0.0000 OCN= 0.0000 TBS= 0.0008	NET= 0.0014 FFC= 0.0008 BIO= 0.0000 OCN= 0.0000 TBS= 0.0006	NET= 0.0017 FFC= 0.0011 BIO= 0.0000 OCN= 0.0000 TBS= 0.0007	NET= 0.0007 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0007	NET= 0.0108 FFC= 0.0101 BIO= 0.0000 OCN= 0.0000 TBS= 0.0007	NET= 0.0225 FFC= 0.0204 BIO= 0.0000 OCN= 0.0000 TBS= 0.0021	NET= 0.0177 FFC= 0.0163 BIO= 0.0000 OCN= 0.0000 TBS= 0.0014	NET= 0.0362 FFC= 0.0356 BIO= 0.0000 OCN= 0.0000 TBS= 0.0006	NET= 0.0312 FFC= 0.0304 BIO= 0.0000 OCN= 0.0000 TBS= 0.0008	NET= 0.0187 FFC= 0.0180 BIO= 0.0000 OCN= 0.0000 TBS= 0.0006
17.5	NET= -0.0006 FFC= 0.0001 BIO= 0.0000 OCN= 0.0000 TBS= -0.0007	NET= 0.0002 FFC= 0.0002 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	NET= 0.0022 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0022	NET= 0.0022 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0022	NET= 0.0003 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0003	NET= 0.0006 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0006	NET= 0.0016 FFC= 0.0006 BIO= 0.0000 OCN= 0.0000 TBS= 0.0010	NET= -0.0009 FFC= 0.0002 BIO= 0.0000 OCN= 0.0000 TBS= -0.0011	NET= 0.0142 FFC= 0.0131 BIO= 0.0000 OCN= 0.0000 TBS= 0.0012	NET= 0.0021 FFC= 0.0020 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001	NET= 0.0068 FFC= 0.0070 BIO= 0.0000 OCN= 0.0000 TBS= -0.0002	NET= 0.0054 FFC= 0.0044 BIO= 0.0000 OCN= 0.0000 TBS= 0.0010
12.5	NET= -0.0341 FFC= 0.0020 BIO= 0.0000 OCN= 0.0000 TBS= -0.0361	NET= -0.0234 FFC= 0.0064 BIO= 0.0000 OCN= 0.0000 TBS= -0.0298	NET= -0.0306 FFC= 0.0001 BIO= 0.0000 OCN= 0.0000 TBS= -0.0307	NET= -0.0242 FFC= 0.0001 BIO= 0.0000 OCN= 0.0000 TBS= -0.0243	NET= -0.0360 FFC= 0.0003 BIO= 0.0000 OCN= 0.0000 TBS= -0.0363	NET= -0.0209 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= -0.0209	NET= -0.0278 FFC= 0.0002 BIO= 0.0000 OCN= 0.0000 TBS= -0.0280	NET= -0.0271 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= -0.0271	NET= 0.0172 FFC= 0.0021 BIO= 0.0000 OCN= 0.0000 TBS= 0.0151	NET= 0.0128 FFC= 0.0014 BIO= 0.0000 OCN= 0.0000 TBS= 0.0114	NET= -0.0142 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= -0.0142	NET= 0.0006 FFC= 0.0000 BIO= 0.0000 OCN= 0.0006 TBS= 0.0000
7.5	NET= -0.0322 FFC= 0.0051 BIO= 0.0000 OCN= 0.0000 TBS= -0.0373	NET= -0.0314 FFC= 0.0093 BIO= 0.0000 OCN= 0.0000 TBS= -0.0407	NET= -0.0450 FFC= 0.0042 BIO= 0.0000 OCN= 0.0000 TBS= -0.0492	NET= -0.0486 FFC= 0.0001 BIO= 0.0000 OCN= 0.0000 TBS= -0.0487	NET= -0.0640 FFC= 0.0001 BIO= 0.0000 OCN= 0.0000 TBS= -0.0641	NET= -0.0498 FFC= 0.0004 BIO= 0.0000 OCN= 0.0000 TBS= -0.0502	NET= -0.0487 FFC= 0.0004 BIO= 0.0000 OCN= 0.0000 TBS= -0.0491	NET= -0.0218 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= -0.0218	NET= 0.0150 FFC= 0.0008 BIO= 0.0000 OCN= 0.0000 TBS= 0.0142	NET= 0.0234 FFC= 0.0004 BIO= 0.0000 OCN= 0.0000 TBS= 0.0230	NET= -0.1182 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= -0.1182	NET= 0.0081 FFC= 0.0000 BIO= 0.0000 OCN= 0.0081 TBS= 0.0000
2.5	NET= -0.0087 FFC= 0.0000 BIO= 0.0000 OCN= 0.0018 TBS= -0.0104	NET= -0.0172 FFC= 0.0021 BIO= 0.0000 OCN= 0.0021 TBS= -0.0214	NET= -0.0257 FFC= 0.0027 BIO= 0.0000 OCN= 0.0000 TBS= -0.0284	NET= -0.0288 FFC= 0.0008 BIO= 0.0000 OCN= 0.0000 TBS= -0.0296	NET= -0.0267 FFC= 0.0003 BIO= 0.0000 OCN= 0.0000 TBS= -0.0270	NET= -0.0278 FFC= 0.0004 BIO= 0.0000 OCN= 0.0000 TBS= -0.0282	NET= -0.0230 FFC= 0.0006 BIO= 0.0000 OCN= 0.0000 TBS= -0.0236	NET= 0.0101 FFC= 0.0015 BIO= 0.0000 OCN= 0.0000 TBS= 0.0086	NET= 0.2181 FFC= 0.0007 BIO= 0.2000 OCN= 0.0000 TBS= 0.0174	NET= 0.0248 FFC= 0.0002 BIO= 0.0000 OCN= 0.0000 TBS= 0.0246	NET= -0.0020 FFC= 0.0000 BIO= 0.0000 OCN= 0.0027 TBS= -0.0047	NET= 0.0072 FFC= 0.0000 BIO= 0.0000 OCN= 0.0072 TBS= 0.0000
-2.5	NET= 0.0043 FFC= 0.0000 BIO= 0.0000 OCN= 0.0043 TBS= 0.0000	NET= 0.0043 FFC= 0.0002 BIO= 0.0000 OCN= 0.0041 TBS= 0.0000	NET= 0.0114 FFC= 0.0017 BIO= 0.0000 OCN= 0.0000 TBS= 0.0098	NET= 1.3036 FFC= 0.0007 BIO= 1.3000 OCN= 0.0000 TBS= 0.0029	NET= 0.0084 FFC= 0.0003 BIO= 0.0000 OCN= 0.0000 TBS= 0.0081	NET= 0.0152 FFC= 0.0005 BIO= 0.0000 OCN= 0.0000 TBS= 0.0147	NET= 0.0194 FFC= 0.0007 BIO= 0.0000 OCN= 0.0000 TBS= 0.0188	NET= 0.2184 FFC= 0.0017 BIO= 0.2000 OCN= 0.0000 TBS= 0.0167	NET= 0.2108 FFC= 0.0002 BIO= 0.2000 OCN= 0.0000 TBS= 0.0106	NET= 0.0084 FFC= 0.0000 BIO= 0.0000 OCN= 0.0084 TBS= 0.0000	NET= 0.0027 FFC= 0.0000 BIO= 0.0000 OCN= 0.0027 TBS= 0.0000	NET= 0.0025 FFC= 0.0000 BIO= 0.0000 OCN= 0.0025 TBS= 0.0000
-7.5	NET= 0.0088 FFC= 0.0000 BIO= 0.0000 OCN= 0.0088 TBS= 0.0000	NET= 0.0038 FFC= 0.0000 BIO= 0.0000 OCN= 0.0038 TBS= 0.0000	NET= 0.0083 FFC= 0.0003 BIO= 0.0000 OCN= 0.0000 TBS= 0.0080	NET= 0.0241 FFC= 0.0004 BIO= 0.0000 OCN= 0.0000 TBS= 0.0237	NET= 0.0352 FFC= 0.0004 BIO= 0.0000 OCN= 0.0000 TBS= 0.0348	NET= 0.0254 FFC= 0.0004 BIO= 0.0000 OCN= 0.0000 TBS= 0.0250	NET= 0.0282 FFC= 0.0006 BIO= 0.0000 OCN= 0.0000 TBS= 0.0276	NET= 0.0206 FFC= 0.0003 BIO= 0.0000 OCN= 0.0000 TBS= 0.0203	NET= 0.2012 FFC= 0.0000 BIO= 0.2000 OCN= 0.0000 TBS= 0.0012	NET= 0.2011 FFC= 0.0000 BIO= 0.2000 OCN= 0.0011 TBS= 0.0000	NET= 0.0008 FFC= 0.0000 BIO= 0.0000 OCN= 0.0008 TBS= 0.0000	NET= 0.0008 FFC= 0.0001 BIO= 0.0000 OCN= 0.0008 TBS= 0.0000
-12.5	NET= 0.0022 FFC= 0.0000 BIO= 0.0000 OCN= 0.0022 TBS= 0.0000	NET= 0.0018 FFC= 0.0000 BIO= 0.0000 OCN= 0.0018 TBS= 0.0000	NET= 0.0008 FFC= 0.0001 BIO= 0.0000 OCN= 0.0003 TBS= 0.0004	NET= 0.1202 FFC= 0.0004 BIO= 0.1000 OCN= 0.0000 TBS= 0.0198	NET= 0.3254 FFC= 0.0006 BIO= 0.3000 OCN= 0.0000 TBS= 0.0248	NET= 0.3282 FFC= 0.0006 BIO= 0.3000 OCN= 0.0000 TBS= 0.0276	NET= 0.0295 FFC= 0.0007 BIO= 0.0000 OCN= 0.0000 TBS= 0.0288	NET= 0.0247 FFC= 0.0004 BIO= 0.0000 OCN= 0.0000 TBS= 0.0243	NET= 0.3001 FFC= 0.0001 BIO= 0.3000 OCN= 0.0000 TBS= 0.0000	NET= 0.1991 FFC= 0.0001 BIO= 0.2000 OCN= -0.0012 TBS= 0.0002	NET= -0.0007 FFC= 0.0000 BIO= 0.0000 OCN= -0.0007 TBS= 0.0000	NET= -0.0002 FFC= 0.0000 BIO= 0.0000 OCN= -0.0002 TBS= 0.0000
-17.5	NET= 0.0024 FFC= 0.0000 BIO= 0.0000 OCN= 0.0024 TBS= 0.0000	NET= 0.0025 FFC= 0.0000 BIO= 0.0000 OCN= 0.0025 TBS= 0.0000	NET= 0.0004 FFC= 0.0001 BIO= 0.0000 OCN= 0.0000 TBS= 0.0003	NET= 0.0176 FFC= 0.0002 BIO= 0.0000 OCN= 0.0000 TBS= 0.0174	NET= 0.0230 FFC= 0.0001 BIO= 0.0000 OCN= 0.0000 TBS= 0.0229	NET= 0.0351 FFC= 0.0063 BIO= 0.0000 OCN= 0.0000 TBS= 0.0288	NET= 0.0357 FFC= 0.0062 BIO= 0.0000 OCN= 0.0000 TBS= 0.0296	NET= 0.7257 FFC= 0.0002 BIO= 0.7000 OCN= 0.0000 TBS= 0.0256	NET= 0.0018 FFC= 0.0002 BIO= 0.0000 OCN= 0.0000 TBS= 0.0016	NET= 0.3064 FFC= 0.0002 BIO= 0.3000 OCN= 0.0000 TBS= 0.0062	NET= 0.3000 FFC= 0.0000 BIO= 0.3000 OCN= 0.0000 TBS= 0.0000	NET= -0.0035 FFC= 0.0000 BIO= 0.0000 OCN= -0.0035 TBS= 0.0000
-22.5	NET= 0.0088 FFC= 0.0000 BIO= 0.0000 OCN= 0.0088 TBS= 0.0000	NET= 0.0030 FFC= 0.0000 BIO= 0.0000 OCN= 0.0030 TBS= 0.0000	NET= 0.0081 FFC= 0.0000 BIO= 0.0000 OCN= 0.0080 TBS= 0.0001	NET= 0.0075 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0075	NET= 0.0181 FFC= 0.0003 BIO= 0.0000 OCN= 0.0000 TBS= 0.0178	NET= 0.0338 FFC= 0.0156 BIO= 0.0000 OCN= 0.0000 TBS= 0.0182	NET= 0.0299 FFC= 0.0100 BIO= 0.0000 OCN= 0.0000 TBS= 0.0199	NET= 0.0079 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0079	NET= -0.0034 FFC= 0.0001 BIO= 0.0000 OCN= -0.0045 TBS= 0.0010	NET= 0.0136 FFC= 0.0002 BIO= 0.0000 OCN= 0.0000 TBS= 0.0134	NET= -0.0005 FFC= 0.0000 BIO= 0.0000 OCN= -0.0005 TBS= 0.0000	NET= -0.0036 FFC= 0.0018 BIO= 0.0000 OCN= -0.0054 TBS= 0.0000
-27.5	NET= 0.0018 FFC= 0.0000 BIO= 0.0000 OCN= 0.0018 TBS= 0.0000	NET= 0.0020 FFC= 0.0000 BIO= 0.0000 OCN= 0.0020 TBS= 0.0000	NET= 0.0028 FFC= 0.0000 BIO= 0.0000 OCN= 0.0028 TBS= 0.0000	NET= 0.0085 FFC= 0.0064 BIO= 0.0000 OCN= 0.0000 TBS= 0.0021	NET= 0.0389 FFC= 0.0348 BIO= 0.0000 OCN= 0.0000 TBS= 0.0041	NET= 0.0093 FFC= 0.0001 BIO= 0.0000 OCN= 0.0000 TBS= 0.0092	NET= 0.0460 FFC= 0.0301 BIO= 0.0000 OCN= 0.0000 TBS= 0.0159	NET= -0.0017 FFC= 0.0000 BIO= 0.0000 OCN= -0.0017 TBS= 0.0000	NET= -0.0073 FFC= 0.0000 BIO= 0.0000 OCN= -0.0073 TBS= 0.0000	NET= 0.0018 FFC= 0.0000 BIO= 0.0000 OCN= -0.0014 TBS= 0.0032	NET= -0.0041 FFC= 0.0000 BIO= 0.0000 OCN= -0.0041 TBS= 0.0000	NET= -0.0017 FFC= 0.0000 BIO= 0.0000 OCN= -0.0017 TBS= 0.0000

Figure 10.42 Monthly Average Fluxes for September
(2.5, 57.5)x(32.5, 87.5) (longitude)x(latitude)

Lat		2.5	7.5	12.5	17.5	22.5	27.5	32.5	37.5	42.5	47.5	52.5	57.5
87.5	INT=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IFFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IBAG=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IOC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	ITBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
82.5	INT=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IFFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IBAG=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IOC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	ITBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
77.5	INT=	0.0000	-0.0007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IFFC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IBAG=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IOC=	0.0000	-0.0007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	ITBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
72.5	INT=	-0.0022	-0.0061	-0.0024	-0.0022	-0.0018	-0.0002	-0.0041	-0.0034	0.0000	0.0000	0.0022	0.0000
	IFFC=	0.0000	0.0000	0.0000	0.0000	0.0007	0.0029	0.0000	0.0000	0.0000	0.0000	0.0022	0.0000
	IBAG=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IOC=	-0.0022	-0.0061	-0.0024	-0.0022	-0.0025	-0.0031	-0.0042	-0.0034	0.0000	0.0000	0.0000	0.0000
	ITBS=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
67.5	INT=	-0.0062	-0.0101	-0.0106	0.0023	0.0118	0.0196	0.0006	-0.0084	0.0121	0.0098	0.0180	0.0147
	IFFC=	0.0000	0.0000	0.0018	0.0067	0.0184	0.0232	0.0066	0.0000	0.0123	0.0084	0.0188	0.0133
	IBAG=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IOC=	-0.0062	-0.0101	-0.0123	-0.0050	-0.0066	-0.0036	-0.0060	-0.0081	0.0000	0.0000	0.0000	0.0000
	ITBS=	0.0000	0.0000	-0.0001	-0.0013	0.0012	0.0023	0.0002	-0.0022	0.0000	0.0031	0.0011	0.0034
62.5	INT=	-0.0417	-0.0222	0.0124	0.0163	0.0634	0.0413	0.0328	0.0362	0.0846	0.0812	0.0671	0.0486
	IFFC=	0.0000	0.0146	0.0208	0.0162	0.0487	0.0536	0.0339	0.0317	0.0437	0.0384	0.0482	0.0528
	IBAG=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IOC=	-0.0417	-0.0368	-0.0086	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	ITBS=	0.0000	-0.0016	-0.0038	-0.0010	0.0087	0.0078	-0.0011	0.0045	0.0132	0.0135	0.0119	0.0280
57.5	INT=	-0.0402	0.0686	0.0773	0.0467	0.0800	0.0874	0.1868	0.2812	0.1298	0.1118	0.0867	0.1064
	IFFC=	0.0000	0.0896	0.0788	0.0340	0.0725	0.0808	0.1723	0.2542	0.0847	0.0830	0.0732	0.0871
	IBAG=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IOC=	-0.0402	-0.0028	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	ITBS=	0.0000	-0.0034	-0.0030	0.0127	0.0078	0.0184	0.0142	0.0288	0.0311	0.0280	0.0136	0.0183
52.5	INT=	0.2464	0.4208	0.8187	0.3858	0.3228	0.2198	0.2242	0.3700	0.0872	0.1782	0.1061	0.1281
	IFFC=	0.2369	0.8182	0.6044	0.5732	0.3134	0.2108	0.2022	0.2377	0.0862	0.2376	0.0734	0.1004
	IBAG=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IOC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	ITBS=	0.0092	0.0023	0.0113	0.0227	0.0084	0.0031	0.0218	0.0323	0.0367	0.0376	0.0327	0.0227
47.5	INT=	0.2102	0.3241	0.3777	0.2352	0.2760	0.2896	0.2897	0.2338	0.0898	0.0738	0.0310	0.0306
	IFFC=	0.1991	0.3142	0.3668	0.2128	0.2582	0.2871	0.2778	0.2306	0.0736	0.0622	0.0164	0.0137
	IBAG=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IOC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	ITBS=	0.0114	0.0098	0.0111	0.0226	0.0182	0.0018	0.0118	0.0162	0.0160	0.0227	0.0146	0.0168
42.5	INT=	0.0777	0.0831	0.1378	0.1080	0.1781	0.1478	0.0187	0.0208	0.1467	0.1336	0.0100	0.0525
	IFFC=	0.0812	0.0962	0.1482	0.0996	0.1866	0.1498	0.0112	0.0134	0.1348	0.1274	0.0036	0.0338
	IBAG=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IOC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	ITBS=	-0.0034	-0.0133	-0.0107	0.0084	0.0085	-0.0021	0.0085	0.0076	0.0130	0.0062	0.0064	0.0187
37.5	INT=	0.0138	0.0330	0.0380	0.0078	0.0480	0.0220	0.0362	0.0442	0.0368	0.0480	0.0334	0.0284
	IFFC=	0.0122	0.0290	0.0362	0.0108	0.0418	0.0186	0.0335	0.0401	0.0381	0.0347	0.0300	0.0258
	IBAG=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IOC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	ITBS=	0.0022	0.0040	0.0034	-0.0030	0.0060	0.0023	0.0064	0.0041	0.0187	0.0143	0.0026	0.0062
32.5	INT=	0.0200	0.0178	0.0178	0.0008	0.0094	0.0105	0.0410	0.0482	0.0280	0.0348	0.0280	0.0181
	IFFC=	0.0081	0.0102	0.0108	0.0011	0.0083	0.0107	0.0387	0.0472	0.0238	0.0222	0.0182	0.0141
	IBAG=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	IOC=	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	ITBS=	0.0118	0.0076	0.0072	-0.0002	0.0041	-0.0008	0.0042	0.0110	0.0023	0.0124	0.0085	0.0046

Figure 10.43 Monthly Average Fluxes for September
(62.5, 117.5)x(-87.5, -32.5) (longitude)x(latitude)

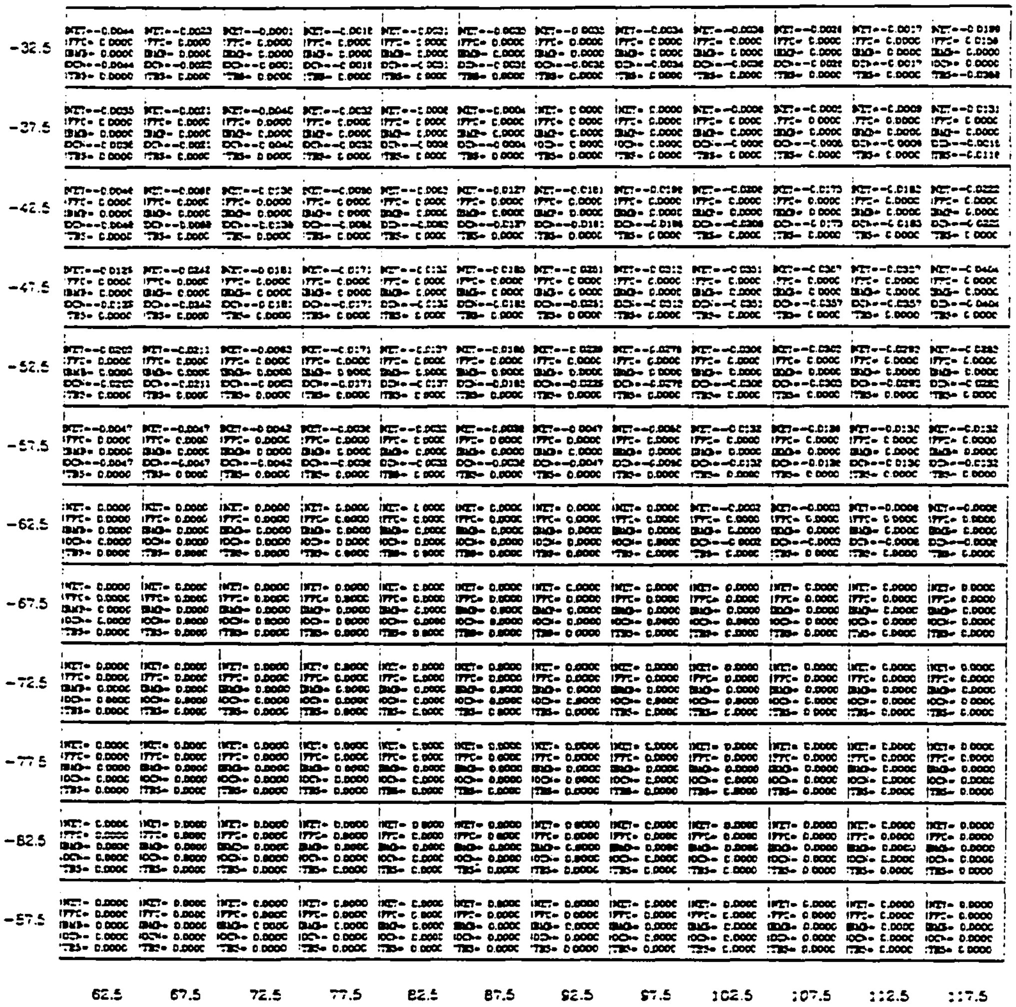

Figure 10.44 Monthly Average Fluxes for September
(62.5, 117.5)x(-27.5, 27.5) (longitude)x(latitude)

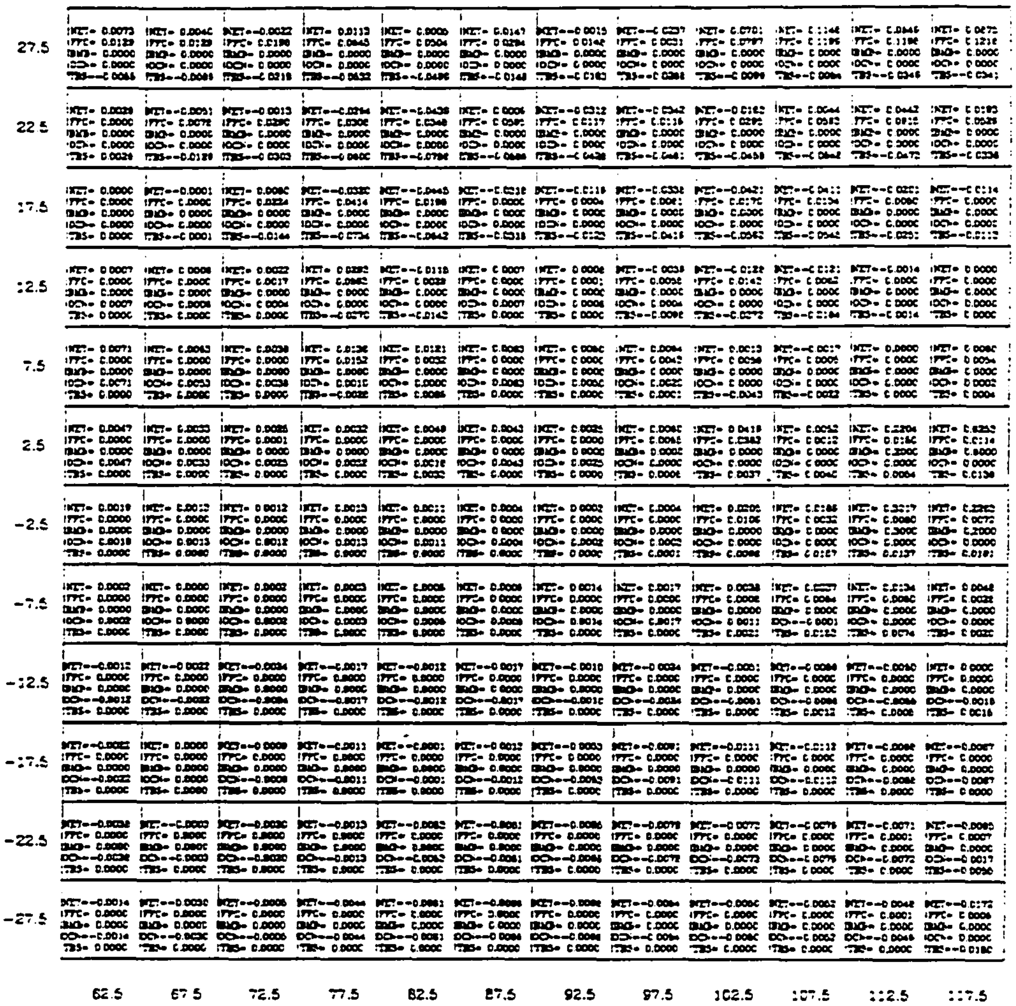

Figure 10.45 Monthly Average Fluxes for September
(62.5, 117.5)x(32.5, 87.5) (longitude)x(latitude)

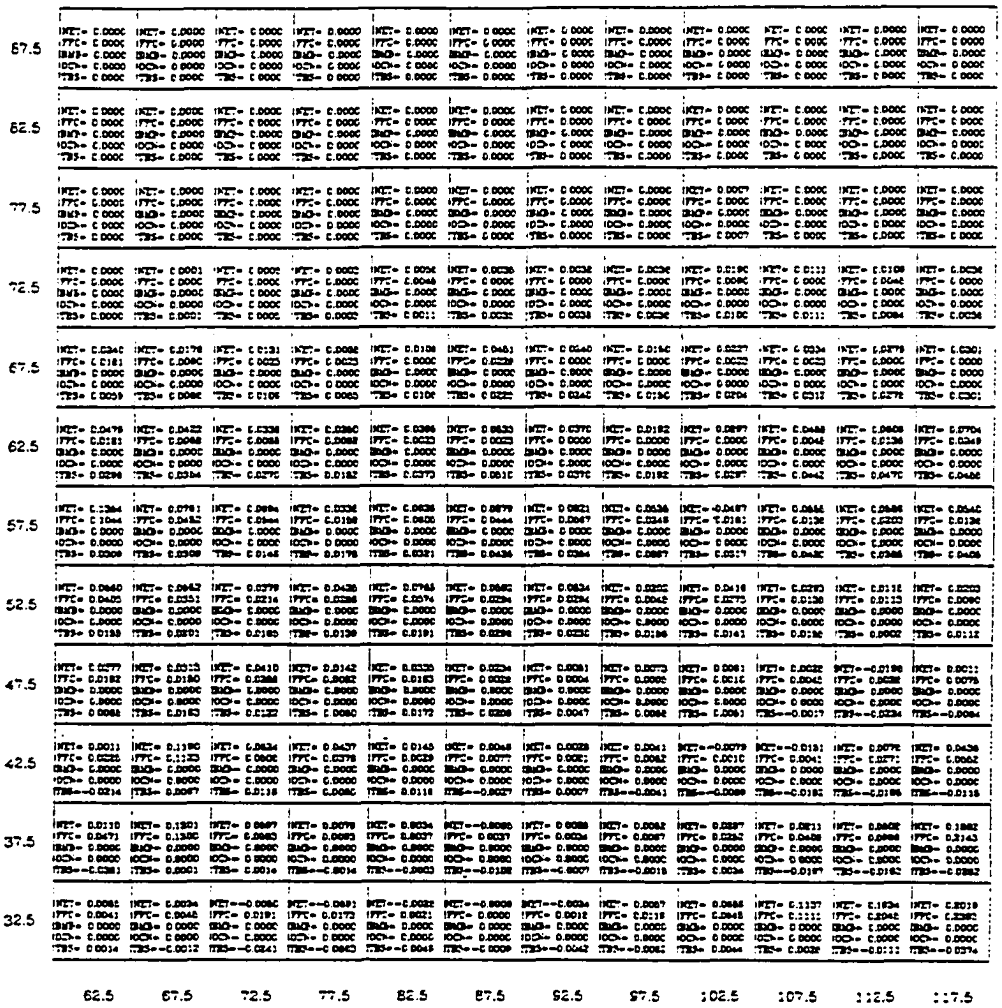

Figure 10.46 Monthly Average Fluxes for September
(122.5, 177.5)x(-87.5, -32.5) (longitude)x(latitude)

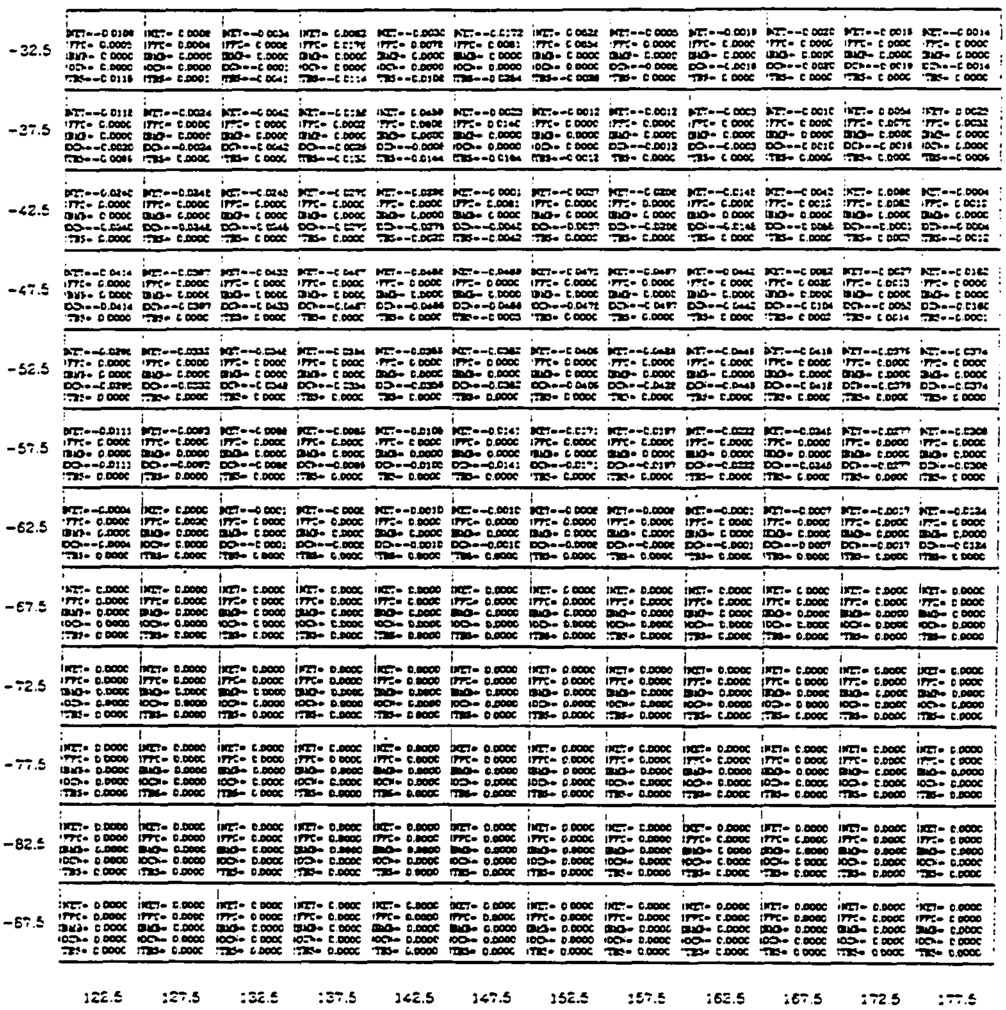

Figure 10.47 Monthly Average Fluxes for September
(122.5, 177.5)x(-27.5, 27.5) (longitude)x(latitude)

Lat.	122.5	127.5	132.5	137.5	142.5	147.5
27.5	NET= 0.0018 FFC= 0.0448 BIO= 0.0000 OCN= 0.0000 TBS=-0.0430	NET=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS=-0.0001	NET=-0.0018 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS=-0.0018	NET=-0.0022 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS=-0.0021	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000	NET= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000
22.5	NET= 0.0621 FFC= 0.0748 BIO= 0.0000 OCN= 0.0000 TBS=-0.0127	NET=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS=-0.0001	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000
17.5	NET= 0.0050 FFC= 0.0091 BIO= 0.0000 OCN= 0.0000 TBS=-0.0041	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000
12.5	NET= 0.0041 FFC= 0.0087 BIO= 0.0000 OCN= 0.0000 TBS=-0.0046	NET= 0.0007 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0007	NET= 0.0001 FFC= 0.0000 BIO= 0.0000 OCN= 0.0001 TBS= 0.0000	NET= 0.0001 FFC= 0.0000 BIO= 0.0000 OCN= 0.0001 TBS= 0.0000	NET= 0.0030 FFC= 0.0011 BIO= 0.0000 OCN= 0.0019 TBS= 0.0000	NET= 0.0024 FFC= 0.0000 BIO= 0.0000 OCN= 0.0024 TBS= 0.0000
7.5	NET= 0.8060 FFC= 0.0078 BIO= 0.8000 OCN= 0.0000 TBS=-0.0018	NET= 0.2114 FFC= 0.0036 BIO= 0.2000 OCN= 0.0000 TBS= 0.0078	NET= 0.1022 FFC= 0.0000 BIO= 0.1000 OCN= 0.0022 TBS= 0.0000	NET= 0.0025 FFC= 0.0000 BIO= 0.0000 OCN= 0.0025 TBS= 0.0000	NET= 0.0175 FFC= 0.0000 BIO= 0.0000 OCN= 0.0175 TBS= 0.0000	NET= 0.0247 FFC= 0.0000 BIO= 0.0000 OCN= 0.0247 TBS= 0.0000
2.5	NET= 0.5046 FFC= 0.0030 BIO= 0.5000 OCN= 0.0000 TBS= 0.0016	NET= 0.1980 FFC= 0.0012 BIO= 0.2000 OCN= 0.0000 TBS=-0.0032	NET= 0.1007 FFC= 0.0000 BIO= 0.1000 OCN= 0.0007 TBS= 0.0000	NET= 0.4020 FFC= 0.0000 BIO= 0.4000 OCN= 0.0020 TBS= 0.0000	NET= 0.0142 FFC= 0.0000 BIO= 0.0000 OCN= 0.0142 TBS= 0.0000	NET= 0.2186 FFC= 0.0000 BIO= 0.2000 OCN= 0.0186 TBS= 0.0000
-2.5	NET= 0.1075 FFC= 0.0036 BIO= 0.1000 OCN= 0.0000 TBS= 0.0039	NET= 0.0941 FFC= 0.0012 BIO= 0.1000 OCN= 0.0000 TBS=-0.0071	NET= 0.1046 FFC= 0.0035 BIO= 0.1000 OCN= 0.0001 TBS= 0.0010	NET= 0.0064 FFC= 0.0030 BIO= 0.0000 OCN= 0.0007 TBS= 0.0027	NET= 0.2037 FFC= 0.0003 BIO= 0.2000 OCN= 0.0034 TBS= 0.0000	NET= 0.3026 FFC= 0.0001 BIO= 0.3000 OCN= 0.0025 TBS= 0.0000
-7.5	NET= 0.0009 FFC= 0.0012 BIO= 0.0000 OCN= 0.0000 TBS=-0.0003	NET=-0.0001 FFC= 0.0012 BIO= 0.0000 OCN= 0.0000 TBS=-0.0013	NET= 0.0014 FFC= 0.0000 BIO= 0.0000 OCN= 0.0014 TBS= 0.0000	NET= 0.0002 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0002	NET=-0.0044 FFC= 0.0010 BIO= 0.0000 OCN= 0.0000 TBS=-0.0054	NET= 0.0006 FFC= 0.0007 BIO= 0.0000 OCN= 0.0000 TBS=-0.0001
-12.5	NET= 0.0013 FFC= 0.0000 BIO= 0.0000 OCN=-0.0010 TBS= 0.0023	NET= 0.0019 FFC= 0.0001 BIO= 0.0000 OCN= 0.0000 TBS= 0.0018	NET= 0.0051 FFC= 0.0003 BIO= 0.0000 OCN= 0.0002 TBS= 0.0046	NET= 0.0033 FFC= 0.0001 BIO= 0.0000 OCN= 0.0000 TBS= 0.0032	NET=-0.0012 FFC= 0.0010 BIO= 0.0000 OCN= 0.0000 TBS=-0.0022	NET=-0.0009 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS=-0.0009
-17.5	NET=-0.0032 FFC= 0.0003 BIO= 0.0000 OCN=-0.0034 TBS= 0.0002	NET= 0.0063 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0063	NET= 0.0077 FFC= 0.0003 BIO= 0.0000 OCN= 0.0000 TBS= 0.0074	NET= 0.0097 FFC= 0.0010 BIO= 0.0000 OCN= 0.0000 TBS= 0.0088	NET= 0.0080 FFC= 0.0020 BIO= 0.0000 OCN= 0.0000 TBS= 0.0060	NET= 0.0036 FFC= 0.0007 BIO= 0.0000 OCN= 0.0000 TBS= 0.0032
-22.5	NET=-0.0030 FFC= 0.0003 BIO= 0.0000 OCN= 0.0000 TBS=-0.0033	NET= 0.0011 FFC= 0.0001 BIO= 0.0002 OCN= 0.0000 TBS= 0.0008	NET= 0.0006 FFC= 0.0004 BIO= 0.0000 OCN= 0.0000 TBS= 0.0002	NET= 0.0044 FFC= 0.0013 BIO= 0.0000 OCN= 0.0000 TBS= 0.0031	NET= 0.0081 FFC= 0.0029 BIO= 0.0000 OCN= 0.0000 TBS= 0.0052	NET= 0.0082 FFC= 0.0028 BIO= 0.0000 OCN= 0.0000 TBS= 0.0054
-27.5	NET=-0.0120 FFC= 0.0006 BIO= 0.0000 OCN= 0.0000 TBS=-0.0127	NET=-0.0005 FFC= 0.0003 BIO= 0.0000 OCN= 0.0000 TBS=-0.0008	NET=-0.0002 FFC= 0.0012 BIO= 0.0000 OCN= 0.0000 TBS=-0.0011	NET= 0.0004 FFC= 0.0012 BIO= 0.0000 OCN= 0.0000 TBS=-0.0008	NET= 0.0012 FFC= 0.0036 BIO= 0.0000 OCN= 0.0000 TBS=-0.0022	NET=-0.0047 FFC= 0.0036 BIO= 0.0000 OCN= 0.0000 TBS=-0.0086

Lat.	152.5	157.5	162.5	167.5	172.5	177.5
27.5	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000
22.5	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000
17.5	NET=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0003 FFC= 0.0000 BIO= 0.0000 OCN=-0.0003 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BIO= 0.0000 OCN=-0.0004 TBS= 0.0000	NET=-0.0004 FFC= 0.0000 BIO= 0.0000 OCN=-0.0004 TBS= 0.0000
12.5	NET= 0.0025 FFC= 0.0000 BIO= 0.0000 OCN= 0.0025 TBS= 0.0000	NET= 0.0036 FFC= 0.0000 BIO= 0.0000 OCN= 0.0036 TBS= 0.0000	NET= 0.0035 FFC= 0.0000 BIO= 0.0000 OCN= 0.0035 TBS= 0.0000	NET= 0.0037 FFC= 0.0000 BIO= 0.0000 OCN= 0.0037 TBS= 0.0000	NET= 0.0034 FFC= 0.0000 BIO= 0.0000 OCN= 0.0034 TBS= 0.0000	NET= 0.0037 FFC= 0.0000 BIO= 0.0000 OCN= 0.0037 TBS= 0.0000
7.5	NET= 0.0322 FFC= 0.0000 BIO= 0.0000 OCN= 0.0322 TBS= 0.0000	NET= 0.0413 FFC= 0.0000 BIO= 0.0000 OCN= 0.0413 TBS= 0.0000	NET= 0.0381 FFC= 0.0000 BIO= 0.0000 OCN= 0.0381 TBS= 0.0000	NET= 0.0369 FFC= 0.0000 BIO= 0.0000 OCN= 0.0369 TBS= 0.0000	NET= 0.0341 FFC= 0.0000 BIO= 0.0000 OCN= 0.0341 TBS= 0.0000	NET= 0.0366 FFC= 0.0000 BIO= 0.0000 OCN= 0.0366 TBS= 0.0000
2.5	NET= 0.0180 FFC= 0.0000 BIO= 0.0000 OCN= 0.0180 TBS= 0.0000	NET= 0.0218 FFC= 0.0000 BIO= 0.0000 OCN= 0.0218 TBS= 0.0000	NET= 0.0193 FFC= 0.0000 BIO= 0.0000 OCN= 0.0193 TBS= 0.0000	NET= 0.0181 FFC= 0.0000 BIO= 0.0000 OCN= 0.0181 TBS= 0.0000	NET= 0.0174 FFC= 0.0000 BIO= 0.0000 OCN= 0.0174 TBS= 0.0000	NET= 0.0158 FFC= 0.0000 BIO= 0.0000 OCN= 0.0158 TBS= 0.0000
-2.5	NET= 0.0048 FFC= 0.0001 BIO= 0.0000 OCN= 0.0048 TBS=-0.0001	NET= 0.0085 FFC= 0.0000 BIO= 0.0000 OCN= 0.0085 TBS= 0.0000	NET= 0.0057 FFC= 0.0000 BIO= 0.0000 OCN= 0.0057 TBS= 0.0000	NET= 0.0035 FFC= 0.0001 BIO= 0.0000 OCN= 0.0034 TBS= 0.0000	NET= 0.0022 FFC= 0.0000 BIO= 0.0000 OCN= 0.0022 TBS= 0.0000	NET= 0.0042 FFC= 0.0000 BIO= 0.0000 OCN= 0.0042 TBS= 0.0000
-7.5	NET=-0.0060 FFC= 0.0001 BIO= 0.0000 OCN= 0.0000 TBS=-0.0061	NET= 0.0002 FFC= 0.0001 BIO= 0.0000 OCN= 0.0001 TBS= 0.0000	NET= 0.0010 FFC= 0.0001 BIO= 0.0000 OCN= 0.0009 TBS= 0.0000	NET= 0.0036 FFC= 0.0000 BIO= 0.0000 OCN= 0.0036 TBS= 0.0000	NET= 0.0062 FFC= 0.0000 BIO= 0.0000 OCN= 0.0062 TBS= 0.0000	NET= 0.0084 FFC= 0.0000 BIO= 0.0000 OCN= 0.0084 TBS= 0.0000
-12.5	NET=-0.0009 FFC= 0.0000 BIO= 0.0000 OCN=-0.0006 TBS=-0.0008	NET=-0.0001 FFC= 0.0000 BIO= 0.0000 OCN=-0.0001 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BIO= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000	NET=-0.0007 FFC= 0.0000 BIO= 0.0000 OCN=-0.0007 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BIO= 0.0000 OCN=-0.0006 TBS= 0.0000
-17.5	NET=-0.0033 FFC= 0.0000 BIO= 0.0000 OCN=-0.0034 TBS= 0.0001	NET=-0.0045 FFC= 0.0000 BIO= 0.0000 OCN=-0.0045 TBS= 0.0000	NET=-0.0017 FFC= 0.0000 BIO= 0.0000 OCN=-0.0017 TBS= 0.0000	NET=-0.0006 FFC= 0.0000 BIO= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0011 FFC= 0.0000 BIO= 0.0000 OCN=-0.0011 TBS= 0.0000	NET=-0.0011 FFC= 0.0000 BIO= 0.0000 OCN=-0.0011 TBS= 0.0000
-22.5	NET= 0.0085 FFC= 0.0005 BIO= 0.0000 OCN= 0.0000 TBS= 0.0084	NET=-0.0006 FFC= 0.0000 BIO= 0.0000 OCN=-0.0006 TBS= 0.0000	NET=-0.0052 FFC= 0.0000 BIO= 0.0000 OCN=-0.0052 TBS= 0.0000	NET= 0.0000 FFC= 0.0014 BIO= 0.0000 OCN=-0.0008 TBS= 0.0000	NET=-0.0015 FFC= 0.0000 BIO= 0.0000 OCN=-0.0015 TBS= 0.0000	NET=-0.0015 FFC= 0.0000 BIO= 0.0000 OCN=-0.0015 TBS= 0.0000
-27.5	NET= 0.0200 FFC= 0.0199 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001	NET=-0.0005 FFC= 0.0000 BIO= 0.0000 OCN=-0.0005 TBS= 0.0000	NET=-0.0042 FFC= 0.0000 BIO= 0.0000 OCN=-0.0042 TBS= 0.0000	NET=-0.0021 FFC= 0.0000 BIO= 0.0000 OCN=-0.0021 TBS= 0.0000	NET=-0.0029 FFC= 0.0000 BIO= 0.0000 OCN=-0.0029 TBS= 0.0000	NET=-0.0036 FFC= 0.0000 BIO= 0.0000 OCN=-0.0036 TBS= 0.0000

Figure 10.48 Monthly Average Fluxes for September
(122.5, 177.5)x(32.5, 87.5) (longitude)x(latitude)

Lat. \ Long.	122.5	127.5	132.5	137.5	142.5	147.5	152.5	157.5	162.5	167.5	172.5	177.5
87.5	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000
82.5	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000
77.5	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000
72.5	INT= 0.0012 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0012	INT= 0.0018 FFC= 0.0023 BIO= 0.0000 OCN= 0.0000 TBS=-0.0006	INT= 0.0022 FFC= 0.0023 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001	INT= 0.0047 FFC= 0.0042 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001	INT= 0.0085 FFC= 0.0083 BIO= 0.0000 OCN= 0.0000 TBS= 0.0007	INT= 0.0075 FFC= 0.0068 BIO= 0.0000 OCN= 0.0000 TBS= 0.0007	INT= 0.0134 FFC= 0.0132 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001	INT= 0.0001 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001	INT= 0.0001 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001	INT= 0.0001 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000
67.5	INT= 0.0174 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0174	INT= 0.0119 FFC= 0.0023 BIO= 0.0000 OCN= 0.0000 TBS= 0.0096	INT= 0.0318 FFC= 0.0246 BIO= 0.0000 OCN= 0.0000 TBS= 0.0067	INT= 0.0344 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0194	INT= 0.0310 FFC= 0.0182 BIO= 0.0000 OCN= 0.0000 TBS= 0.0132	INT= 0.0406 FFC= 0.0249 BIO= 0.0000 OCN= 0.0000 TBS= 0.0181	INT= 0.0487 FFC= 0.0317 BIO= 0.0000 OCN= 0.0000 TBS= 0.0170	INT= 0.0297 FFC= 0.0136 BIO= 0.0000 OCN= 0.0000 TBS= 0.0181	INT= 0.0248 FFC= 0.0168 BIO= 0.0000 OCN= 0.0000 TBS= 0.0093	INT= 0.0290 FFC= 0.0188 BIO= 0.0000 OCN= 0.0000 TBS= 0.0102	INT= 0.0078 FFC= 0.0045 BIO= 0.0000 OCN= 0.0000 TBS= 0.0033	INT= 0.0381 FFC= 0.0349 BIO= 0.0000 OCN= 0.0000 TBS= 0.0032
62.5	INT= 0.0830 FFC= 0.0803 BIO= 0.0000 OCN= 0.0000 TBS= 0.0428	INT= 0.0864 FFC= 0.0594 BIO= 0.0000 OCN= 0.0000 TBS= 0.0270	INT= 0.0378 FFC= 0.0181 BIO= 0.0000 OCN= 0.0000 TBS= 0.0197	INT= 0.0330 FFC= 0.0088 BIO= 0.0000 OCN= 0.0000 TBS= 0.0242	INT= 0.0388 FFC= 0.0181 BIO= 0.0000 OCN= 0.0000 TBS= 0.0206	INT= 0.0372 FFC= 0.0160 BIO= 0.0000 OCN= 0.0000 TBS= 0.0214	INT= 0.0434 FFC= 0.0133 BIO= 0.0000 OCN= 0.0000 TBS= 0.0301	INT= 0.0365 FFC= 0.0023 BIO= 0.0000 OCN= 0.0000 TBS= 0.0344	INT= 0.0273 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0273	INT= 0.0207 FFC= 0.0023 BIO= 0.0000 OCN= 0.0000 TBS= 0.0184	INT= 0.0114 FFC= 0.0053 BIO= 0.0000 OCN= 0.0000 TBS= 0.0061	INT= 0.0108 FFC= 0.0068 BIO= 0.0000 OCN= 0.0000 TBS= 0.0040
57.5	INT= 0.0480 FFC= 0.0048 BIO= 0.0000 OCN= 0.0000 TBS= 0.0448	INT= 0.0570 FFC= 0.0138 BIO= 0.0000 OCN= 0.0000 TBS= 0.0430	INT= 0.0504 FFC= 0.0080 BIO= 0.0000 OCN= 0.0000 TBS= 0.0414	INT= 0.0347 FFC= 0.0068 BIO= 0.0000 OCN= 0.0000 TBS= 0.0279	INT= 0.0200 FFC= 0.0068 BIO= 0.0000 OCN= 0.0000 TBS= 0.0132	INT= 0.0147 FFC= 0.0046 BIO= 0.0000 OCN= 0.0000 TBS= 0.0101	INT= 0.0127 FFC= 0.0022 BIO= 0.0000 OCN= 0.0000 TBS= 0.0106	INT= 0.0107 FFC= 0.0046 BIO= 0.0000 OCN= 0.0000 TBS= 0.0062	INT=-0.0012 FFC= 0.0023 BIO= 0.0000 OCN= 0.0000 TBS=-0.0036	INT= 0.0042 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0042	INT= 0.0066 FFC= 0.0000 BIO= 0.0000 OCN= 0.0071 TBS= 0.0065	INT= 0.0071 FFC= 0.0000 BIO= 0.0000 OCN= 0.0078 TBS=-0.0006
52.5	INT= 0.0281 FFC= 0.0022 BIO= 0.0000 OCN= 0.0000 TBS= 0.0263	INT= 0.0466 FFC= 0.0203 BIO= 0.0000 OCN= 0.0000 TBS= 0.0262	INT= 0.0334 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0334	INT= 0.0270 FFC= 0.0042 BIO= 0.0000 OCN= 0.0000 TBS= 0.0228	INT= 0.0188 FFC= 0.0080 BIO= 0.0000 OCN= 0.0000 TBS= 0.0087	INT= 0.0001 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0001	INT=-0.0008 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS=-0.0008	INT= 0.0086 FFC= 0.0084 BIO= 0.0000 OCN= 0.0000 TBS=-0.0006	INT=-0.0172 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS=-0.0172	INT= 0.0144 FFC= 0.0000 BIO= 0.0000 OCN= 0.0144 TBS= 0.0000	INT= 0.0384 FFC= 0.0000 BIO= 0.0000 OCN= 0.0384 TBS= 0.0000	INT= 0.0278 FFC= 0.0000 BIO= 0.0000 OCN= 0.0278 TBS= 0.0000
47.5	INT= 0.0303 FFC= 0.0189 BIO= 0.0000 OCN= 0.0000 TBS= 0.0104	INT= 0.0767 FFC= 0.0485 BIO= 0.0000 OCN= 0.0000 TBS= 0.0303	INT= 0.0622 FFC= 0.0362 BIO= 0.0000 OCN= 0.0000 TBS= 0.0264	INT= 0.0488 FFC= 0.0188 BIO= 0.0000 OCN= 0.0000 TBS= 0.0300	INT= 0.0317 FFC= 0.0080 BIO= 0.0000 OCN= 0.0000 TBS= 0.0238	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0020 FFC= 0.0000 BIO= 0.0000 OCN= 0.0020 TBS= 0.0000	INT= 0.0030 FFC= 0.0000 BIO= 0.0000 OCN= 0.0036 TBS=-0.0003	INT=-0.0016 FFC= 0.0000 BIO= 0.0000 OCN= 0.0029 TBS=-0.0045	INT= 0.0290 FFC= 0.0000 BIO= 0.0000 OCN= 0.0290 TBS= 0.0000	INT= 0.0303 FFC= 0.0000 BIO= 0.0000 OCN= 0.0303 TBS= 0.0000	INT= 0.0308 FFC= 0.0000 BIO= 0.0000 OCN= 0.0308 TBS= 0.0000
42.5	INT= 0.0742 FFC= 0.0842 BIO= 0.0000 OCN= 0.0000 TBS=-0.0100	INT= 0.1291 FFC= 0.1230 BIO= 0.0000 OCN= 0.0000 TBS= 0.0068	INT= 0.0534 FFC= 0.0411 BIO= 0.0000 OCN= 0.0000 TBS= 0.0122	INT= 0.0140 FFC= 0.0023 BIO= 0.0000 OCN= 0.0000 TBS= 0.0117	INT= 0.2029 FFC= 0.2031 BIO= 0.0000 OCN= 0.0000 TBS=-0.0002	INT= 0.0000 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS= 0.0000	INT= 0.0193 FFC= 0.0000 BIO= 0.0000 OCN= 0.0193 TBS= 0.0000	INT= 0.0211 FFC= 0.0000 BIO= 0.0000 OCN= 0.0212 TBS=-0.0001	INT= 0.0224 FFC= 0.0000 BIO= 0.0000 OCN= 0.0224 TBS= 0.0000	INT= 0.0247 FFC= 0.0000 BIO= 0.0000 OCN= 0.0247 TBS= 0.0000	INT= 0.0248 FFC= 0.0000 BIO= 0.0000 OCN= 0.0248 TBS= 0.0000	INT= 0.0270 FFC= 0.0000 BIO= 0.0000 OCN= 0.0270 TBS= 0.0000
37.5	INT= 0.0286 FFC= 0.0499 BIO= 0.0000 OCN= 0.0000 TBS=-0.0213	INT= 0.2353 FFC= 0.2350 BIO= 0.0000 OCN= 0.0000 TBS= 0.0003	INT= 0.0336 FFC= 0.0318 BIO= 0.0000 OCN= 0.0000 TBS= 0.0020	INT= 0.3429 FFC= 0.3427 BIO= 0.0000 OCN= 0.0000 TBS=-0.0000	INT= 0.0982 FFC= 0.1066 BIO= 0.0000 OCN= 0.0000 TBS=-0.0082	INT=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000	INT= 0.0085 FFC= 0.0000 BIO= 0.0000 OCN= 0.0085 TBS= 0.0000	INT= 0.0100 FFC= 0.0000 BIO= 0.0000 OCN= 0.0100 TBS= 0.0000	INT= 0.0106 FFC= 0.0000 BIO= 0.0000 OCN= 0.0106 TBS= 0.0000	INT= 0.0103 FFC= 0.0000 BIO= 0.0000 OCN= 0.0103 TBS= 0.0000	INT= 0.0106 FFC= 0.0000 BIO= 0.0000 OCN= 0.0106 TBS= 0.0000	INT= 0.0129 FFC= 0.0000 BIO= 0.0000 OCN= 0.0126 TBS= 0.0000
32.5	INT= 0.0634 FFC= 0.0792 BIO= 0.0000 OCN= 0.0000 TBS=-0.0281	INT= 0.0086 FFC= 0.0188 BIO= 0.0000 OCN= 0.0000 TBS=-0.0022	INT= 0.2070 FFC= 0.2100 BIO= 0.0000 OCN= 0.0000 TBS=-0.0030	INT= 0.0730 FFC= 0.0810 BIO= 0.0000 OCN= 0.0000 TBS=-0.0080	INT=-0.0042 FFC= 0.0000 BIO= 0.0000 OCN= 0.0000 TBS=-0.0042	INT=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000	INT=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0003 TBS= 0.0000	INT=-0.0003 FFC= 0.0000 BIO= 0.0000 OCN=-0.0003 TBS= 0.0000	INT=-0.0004 FFC= 0.0000 BIO= 0.0000 OCN=-0.0004 TBS= 0.0000	INT=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000	INT=-0.0002 FFC= 0.0000 BIO= 0.0000 OCN=-0.0002 TBS= 0.0000	INT=-0.0004 FFC= 0.0000 BIO= 0.0000 OCN=-0.0004 TBS= 0.0000

CHAPTER 11: Conclusions

Global biomass burning is a significant source of atmospheric CO_2 which contributes to the global warming by the trapping of thermal radiation emitted from the earth. Biomass burning is currently responsible for the emission of as much as 2.35 Pg of carbon into the atmosphere annually , and there is every expectation that this will increase.

The global carbon cycle regulates the amount of CO_2 remaining in the atmosphere. Since biomass burning affects the global carbon cycle in many ways, it is important to develop quantitative descriptions of how the carbon cycle will be affected and, in turn, how the atmospheric levels of CO_2 will respond.

A global carbon cycle model with a realistic terrestrial biosphere and a realistic world ocean carbon cycle has been constructed from existing local models and model output validated against CO_2 concentrations observed in the atmosphere at NOAA/GMCC monitoring stations. The numerical model has a horizontal resolution of 5 degrees by 5 degrees latitude by longitude, seasonal time scales, and a maximum simulation period of approximately 15 years. The maximum simulation time is estimated from the time for the uncertainty in the predicted quantity, in this case the global distribution of atmospheric CO_2 to increase such that the magnitude of the uncertainty is comparable to the magnitude of the quantity being predicted. Here, the magnitude of the uncertainty in the atmospheric CO_2 concentration field is directly related to the atmospheric circulation. The atmospheric circulation module is not valid for simulation times longer than 10 or 15 years, since there are various atmospheric modes, such as El Nino and the quasi-biennial oscillation which occur with periods of several years to decades. The terrestrial biosphere is represented by a set of eight separate site-specific ecosystem models. These models have several advantages which include realistic representation of seasonality and response to atmospheric CO_2 concentrations. These models can also be used to represent changing ecosystem distributions and can be either improved or replaced individually without affecting the rest of the terrestrial biosphere module. The ocean carbon cycle model is embedded in an existing ocean general circulation model in order to give a realistic geographic distribution of ocean sources and sinks for CO_2.

No net change in the distribution of sources and sinks for atmospheric CO_2 was observed for the model run from 1990-2000. This means that during the course of the model run, neither the terrestrial biosphere nor the ocean behaved differently due to the increased atmospheric CO_2. The terrestrial biosphere is expected to respond to increased atmospheric CO_2 by increasing the amount of carbon sequestered in plants through CO_2 fertilization, while the ocean is expected to respond to the difference in CO_2 partial pressures between the atmosphere and the ocean surface waters. That no change was predicted is likely due to the fact that observed changes in the ocean and biosphere take several decades to be detected, as in the case of CO_2 fertilization of the terrestrial biosphere, and in the case of the ocean sinks, the decadal exchange times for water flow between the surface and deep ocean.

It is concluded that atmospheric CO_2 concentrations will continue to rise well into the next century given any realistic scenario for either future fossil fuel use or biomass burning, keeping in mind that the model assumes that any CO_2 emitted by annual biomass burning of savannas is taken up by the these regions during the next growing season. Thus, the only net CO_2 released by biomass burning originates from burning of the tropical forests. Also excluded from the biomass burning sources of CO_2 is the burning of fuel wood and charcoal. This results in a 15% underestimate of CO_2 released. However, the modeling of the burning of fuel wood and charcoal was beyond the scope of this research.

The buildup of CO_2 in the atmosphere is somewhat rapid (figures 10.6 - 10.9). This is due to the atmospheric module's underestimation of vertical mixing. This underestimate causes the CO_2 to mix less rapidly with the atmosphere, thus regions of the biosphere and oceans that act as sinks for atmospheric CO_2 may have less CO_2 in their grid cell than they would in a well-mixed atmosphere, thus there is an overall underestimate of the global sink for CO_2. The vertical mixing is presently driven by wind only, and to include other mixing schemes, such as moist convection, would require a considerably more complicated model atmosphere. Since the model atmosphere is driven by wind fields predicted at 12 hour intervals, and defined on a 2.5 degree by 2.5 degree grid, any vertical mixing occurring on a small scale or over a short time will be averaged out.

Important to note also is the relatively poor agreement of the model results with the measured values of atmospheric CO_2 in the high latitude regions. This was anticipated in chapter 5 as a result of poor representation of the ecosystem processes. In the mid-latitudes, and particularly near the equator, however, the model agrees well with the measured values in both the amplitude and phase of atmospheric CO_2 concentrations. Also responsible for the disagreement between the model and data shown in figures 10.1 - 10.5 are limitations in the atmospheric model. Specifically, the atmospheric transport model exhibits weak numerical diffusion, and underestimates vertical mixing, as has been previously discussed. These limitations give rise to the strong latitudinal gradients seen in figures 10.10 and 10.11. A final explanation of the discrepancy is that the model results are averaged over a 5 degree by 5 degree area, where the measurement data represents a point somewhere in that grid cell.

The difference in final states depicted in figures 10.10 and 10.11, apart from the fact that they represent different processes, can be explained by noting that in the case of the biomass burning scenario, the source varies with time and location, as opposed to the fossil fuel combustion scenario, which assumes constant average sources. This is equivalent to having the fossil fuel source expressed as an annual average, while the biomass burning source is expressed as monthly averages.

Although the model presented in this research is adequate for the task of determining the changes in atmospheric CO_2 concentration caused by global anthropogenic perturbations to the global carbon cycle, there are certain limitations that one must be made cognizant of in order to better understand the model and the model output. These limitations include processes not represented in the model and feedback effects not represented in the model. Processes not represented in the model were those which did not contribute significantly to the global carbon cycle when compared to other processes for a specified time scale. These processes include river runoff transporting nutrients to coastal oceans, an incomplete representation of the terrestrial biosphere, treatment of interannual atmospheric variability such as the El Nino/Southern Oscillation Pattern and the Quasi Biennial Oscillation, the use of a static set of wind field data, the use of a two layer atmosphere, processes such as ecosystem aging, reforestation, and succession not represented, and the ocean food web (Brewer[60]; Andreae[61]).

The difficulties encountered in global carbon cycle modeling center primarily around the climate-carbon cycle feedbacks. Until a complete coupled global climate model is developed, the effects of global warming and associated climatic changes upon the carbon cycle must be treated as parameters. The other model limitations include processes such as the CO_2 released during biotic changes immediately following deforestation, terrestrial ecosystem succession processes, river runoff processes depositing carbon into the ocean, and coastal ocean carbon processes. These limitations put a constraint on the model's time horizon or how far into the future predictions can be assumed to be accurate.

Examples of feedback effects not modeled include the effect of a warmer climate on the atmospheric and oceanic circulation and the effect of a warmer climate on the redistribution of water vapor in the atmosphere. The connection of the oceanic circulation to the ocean carbon cycle was discussed in Chapter 6. By essentially holding the ocean circulation fixed, certain tracer concentration fields may not be as accurate as they would be by including this feedback. This is due partly because atmospheric variables, such as humidity and circulation, are not allowed to vary in response to a warmer climate.

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VITA

Alexis Kambis was born May 3, 1965 in Richmond, Virginia. Recieved B.S. in Physics and Mathematics from Longwood College in Farmville, Virginia in May of 1988. In September of 1988 he began graduate studies in Physics at the College of William and Mary in Virgina, where he earned a M.S. in August of 1992.