

Reports

---

3-2009

## Climate Change Impacts in Virginia: Status of Natural Resource Data Records as Tools to Assess Continuing Trends

Tamia Rudnicky  
*Virginia Institute of Marine Science*

Marcia Berman  
*Virginia Institute of Marine Science*

Roger L. Mann  
*Virginia Institute of Marine Science*

Carl Hershner  
*Virginia Institute of Marine Science*

Follow this and additional works at: <https://scholarworks.wm.edu/reports>



Part of the [Environmental Sciences Commons](#)

---

### Recommended Citation

Rudnicky, T., Berman, M., Mann, R. L., & Hershner, C. (2009) Climate Change Impacts in Virginia: Status of Natural Resource Data Records as Tools to Assess Continuing Trends. Virginia Institute of Marine Science, William & Mary. <https://doi.org/10.21220/V5BJ2R>

This Report is brought to you for free and open access by W&M ScholarWorks. It has been accepted for inclusion in Reports by an authorized administrator of W&M ScholarWorks. For more information, please contact [scholarworks@wm.edu](mailto:scholarworks@wm.edu).

**Climate Change Impacts in Virginia: Status of Natural  
Resource Data Records as Tools to Assess Continuing Trends**

**Final Report**

**submitted to**

**Virginia Environmental Endowment  
Richmond, Virginia**

**submitted by**

**Tamia Rudnicky  
Marcia Berman  
Roger Mann  
Carl Hershner**

**Virginia Institute of Marine Science  
College of William and Mary  
Gloucester Point, Virginia 23062**

**March, 2009**



# Climate Change Database Inventory

**Tamia Rudnick\***  
**Marcia Berman\***  
**Roger Mann\*\***  
**Carl Hershner\***



**\*Center for Coastal Resources Management**  
**Virginia Institute of Marine Science**  
**College of William and Mary**



**\*\* Department of Fisheries Science**  
**Virginia Institute of Marine Science**

**Funding for this project has been made possible through a grant from  
the Virginia Environmental Endowment (Grant #07-25)**



**March, 2009**

# Climate Change Database Inventory

## Table of Contents

<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>BIOLOGICAL DATA: .....</b>	<b>4</b>
<b>BENTHIC .....</b>	<b>4</b>
<b>FEDERAL AGENCIES.....</b>	<b>4</b>
<b>REGIONAL ORGANIZATIONS.....</b>	<b>5</b>
<b>STATE AGENCIES.....</b>	<b>5</b>
<b>OTHER ORGANIZATIONS.....</b>	<b>6</b>
<b>FAUNA .....</b>	<b>6</b>
<b>Avian.....</b>	<b>6</b>
<b>FEDERAL AGENCIES.....</b>	<b>6</b>
<b>REGIONAL ORGANIZATIONS.....</b>	<b>8</b>
<b>STATE AGENCIES.....</b>	<b>8</b>
<b>OTHER ORGANIZATIONS.....</b>	<b>9</b>
<b>Fish/Shellfish.....</b>	<b>13</b>
<b>FEDERAL AGENCIES.....</b>	<b>13</b>
<b>REGIONAL ORGANIZATIONS.....</b>	<b>14</b>
<b>STATE AGENCIES.....</b>	<b>14</b>
<b>OTHER ORGANIZATIONS.....</b>	<b>16</b>
<b>Insects.....</b>	<b>17</b>
<b>FEDERAL AGENCIES.....</b>	<b>17</b>
<b>REGIONAL ORGANIZATIONS.....</b>	<b>18</b>
<b>STATE AGENCIES.....</b>	<b>18</b>
<b>OTHER ORGANIZATIONS.....</b>	<b>19</b>
<b>Other Fauna.....</b>	<b>19</b>
<b>FEDERAL AGENCIES.....</b>	<b>19</b>
<b>REGIONAL ORGANIZATIONS.....</b>	<b>20</b>
<b>STATE AGENCIES.....</b>	<b>20</b>
<b>OTHER ORGANIZATIONS.....</b>	<b>21</b>
<b>FLORA .....</b>	<b>22</b>
<b>FEDERAL AGENCIES.....</b>	<b>22</b>
<b>REGIONAL ORGANIZATIONS.....</b>	<b>24</b>
<b>STATE AGENCIES.....</b>	<b>24</b>
<b>OTHER ORGANIZATIONS.....</b>	<b>26</b>
<b>COMBINED BIOLOGICAL.....</b>	<b>26</b>
<b>FEDERAL AGENCIES.....</b>	<b>26</b>
<b>REGIONAL ORGANIZATIONS.....</b>	<b>27</b>
<b>STATE AGENCIES.....</b>	<b>27</b>
<b>OTHER ORGANIZATIONS.....</b>	<b>27</b>
<b>PHYSICAL DATA: .....</b>	<b>28</b>
<b>CLIMATIC.....</b>	<b>28</b>
<b>FEDERAL AGENCIES.....</b>	<b>28</b>
<b>REGIONAL ORGANIZATIONS.....</b>	<b>29</b>
<b>STATE AGENCIES.....</b>	<b>29</b>
<b>OTHER ORGANIZATIONS.....</b>	<b>29</b>
<b>LANDSCAPE.....</b>	<b>29</b>
<b>FEDERAL AGENCIES.....</b>	<b>29</b>
<b>REGIONAL ORGANIZATIONS.....</b>	<b>30</b>
<b>STATE AGENCIES.....</b>	<b>31</b>
<b>OTHER ORGANIZATIONS.....</b>	<b>34</b>
<b>WATER RELATED.....</b>	<b>34</b>
<b>FEDERAL AGENCIES.....</b>	<b>34</b>
<b>REGIONAL ORGANIZATIONS.....</b>	<b>36</b>
<b>STATE AGENCIES.....</b>	<b>38</b>

OTHER ORGANIZATIONS.....	39
OTHER.....	40
FEDERAL AGENCIES.....	40
REGIONAL ORGANIZATIONS.....	40
STATE AGENCIES.....	40
OTHER ORGANIZATIONS.....	40
<b>COMBINED BIOLOGICAL AND PHYSICAL DATA:.....</b>	<b>41</b>
FEDERAL AGENCIES.....	41
REGIONAL ORGANIZATIONS.....	42
STATE AGENCIES.....	42
OTHER ORGANIZATIONS.....	44
<b>MISCELLANEOUS DATA: .....</b>	<b>45</b>
FEDERAL AGENCIES.....	45
REGIONAL ORGANIZATIONS.....	48
STATE AGENCIES.....	49
OTHER ORGANIZATIONS.....	49
<b>INDEX:.....</b>	<b>54</b>

## **Executive Summary**

As scientists we pose the hypothesis that climate change over the past decades has left a signal in natural resource status and productivity in Virginia. This signal exists subsumed in a variety of data from crop and forestry production, to fishery landings, to spatial distribution of numerous plant and animal species of interest. Description of these signals in concert with known changes in climate descriptors (temperature, rainfall and more) provide a basis for hind-casting possible cause and effect relationships. If such relationships exist, and we hypothesize that they do, then projections of climate descriptors (temperature, rainfall and more) provide the basis for projections of impacts on defined natural resources, with obvious economic and societal impacts.

Before a comprehensive analysis of extant data can occur we must start with a simple inventory of available data. As simplistic as this may sound we can find no single database that describes the general status of natural resources in Virginia over the past decades. Indeed, we suggest that the majority of such data exists as unpublished (in peer review, and in some instances even technical reports) compilations spread among the various state and federal natural resource agencies active in Virginia.

This body of work had several goals; 1) to assess the scope of natural resource descriptive data available in the Commonwealth of Virginia, 2) to assemble an index of such data, and 3) develop a bibliography to serve as a resource for more comprehensive analyses in the future.

## **BIOLOGICAL DATA:**

### **BENTHIC**

#### *FEDERAL AGENCIES*

**Organization:** NOAA's National Centers for Coastal Ocean Science (NCCOS) - Center for Coastal Monitoring and Assessment (CCMA)

**Contact:** N/A

**Email:** N/A

**Web address:**

[http://www8.nos.noaa.gov/cit/nsandt/download/ba\\_monitoring.aspx](http://www8.nos.noaa.gov/cit/nsandt/download/ba_monitoring.aspx)

**Database name:** Bioeffects Assessment Data

**Description:** Chesapeake Bay 1998-01 data available for chemistry, toxicity, and benthic infauna (sediment quality triad). Bioeffects Assessment Program identifies and assesses biological effects associated with contaminant exposure. Over forty intensive regional studies have been conducted since 1986 using the Sediment Quality Triad approach which utilizes a stratified random sampling method to determine the areal extent of contaminated sediments. The data include: sediment chemistry, toxicity, and species diversity and quantity for the same suite of organic contaminants and trace metals as the Mussel Watch Program.

**Organization:** NOAA's National Centers for Coastal Ocean Science (NCCOS) - Center for Coastal Monitoring and Assessment (CCMA)

**Contact:** N/A

**Email:** N/A

**Web address:**

[http://www8.nos.noaa.gov/cit/nsandt/download/bs\\_monitoring.aspx](http://www8.nos.noaa.gov/cit/nsandt/download/bs_monitoring.aspx)

**Database name:** Monitoring data – Benthic Surveillance.

**Description:** Analyzed chemical and biological contaminant trends in sediment and fish tissue collected at 183 coastal sites from 1984 to 1993. The database includes: sediment, fish liver and fish bile chemistry for over 100 organic and inorganic contaminants, and associated diseases in the fish livers. NOAA Fisheries partnered on this project.

**Organization:** U.S. Department of the Interior Minerals Management Service

**Contact:** N/A

**Email:** tcronin@usgs.gov

**Web address:** <http://www.mms.gov/itd/pubs/1997/97-0025/hobbs5.pdf>

**Database name:** Benthic Foraminifera and Ostracoda from Virginia Continental Shelf

**Description:** Foraminiferal and ostracode species census data are available electronically from the authors. The report: T. M. Cronin, S. Ishman, R. Wagner, and G. R. Cutter, Jr. Part 5: Benthic Foraminifera and Ostracoda from Virginia Continental Shelf. January 1998. Samples were collected in 1996 offshore of Virginia Beach.

## REGIONAL ORGANIZATIONS

**Organization:** Chesapeake Bay Program (CBP)  
**Contact:** Jackie Johnson - Tele: 800-YOUR-BAY ext. 729  
**Email:** N/A  
**Web address:** [http://www.chesapeakebay.net/data\\_benthic.aspx](http://www.chesapeakebay.net/data_benthic.aspx)  
**Database name:** Baywide Benthic Database.  
**Description:** Benthos, sediment images for Chesapeake Bay and tidal tributaries. 1975 – Present.

**Organization:** Chesapeake Bay Program (CBP)  
**Contact:** Jackie Johnson - Tele: 800-YOUR-BAY ext. 729  
**Email:** N/A  
**Web address:** [http://www.chesapeakebay.net/data\\_flouescence.aspx](http://www.chesapeakebay.net/data_flouescence.aspx)  
**Database name:** Baywide Fluorescence Database.  
**Description:** Fluorescence, chlorophyll A, Phytoplankton, vertical and horizontal profiles for Chesapeake Bay and tidal tributaries. Date range: 1984 – present.

**Organization:** Chesapeake Bay Program (CBP)  
**Contact:** Jackie Johnson - Tele: 800-YOUR-BAY ext. 729  
**Email:** N/A  
**Web address:** [http://www.chesapeakebay.net/data\\_plankton.aspx](http://www.chesapeakebay.net/data_plankton.aspx)  
**Database name:** Baywide CBP Plankton Database.  
**Description:** Plankton, phytoplankton, zooplankton, mesozooplankton, gelatinous zooplankton, primary production. Date range: 1984 – present.

## STATE AGENCIES

**Organization:** Department of Environmental Quality (VADEQ)  
**Contact:** Aimee Genung  
**Email:** [ajgenung@deq.virginia.gov](mailto:ajgenung@deq.virginia.gov)  
**Web address:** <http://www.deq.virginia.gov/biomonitoring/homepage.html>  
**Database name:** Freshwater Biological Monitoring Data  
**Description:** The Virginia Department of Environmental Quality's (DEQ) Freshwater Biological Monitoring Program uses the benthic macro invertebrate community to assess the ecological health of freshwater streams and rivers. Benthic macro invertebrates are invertebrate organisms such as insects, crustaceans, snails or worms that live on the bottom of streams and rivers which are large enough to be seen with the naked eye. Because many of the organisms that make up these biological communities are extremely sensitive to pollutants, they often respond to changes in water quality caused by the introduction of various contaminants into a water body from point or non-point source pollution. Most benthic macro invertebrate species have a complex life cycle of approximately one year or more and therefore integrate the effects of fluctuations in water quality over time. In essence, benthic macro invertebrates are considered to be virtual "living recorders" of water quality conditions over time. Analysis of

the community of these organisms provides a measure of the overall water quality of a particular water body segment. Program began in the 1970s.

## OTHER ORGANIZATIONS

**Organization:** Virginia Institute of Marine Science (VIMS)

**Contact:** Bob Diaz

**Email:** diaz@vims.edu

**Web address:** <http://www.vims.edu/bio/benthic/vabeach/vimsvab.html>

or <http://www.mms.gov/itd/pubs/1997/97-0025/hobbs1.pdf>

**Database name:** Benthic Habitats and Biological Resources off the Virginia Coast

**Description:** Task 1 of the "Environmental Studies Relative to Potential Sand Mining in the Vicinity of the City of Virginia Beach, Virginia" involved benthic surveys of the region conducted by V. I. M. S. using sediment profile imaging and bottom grab samples.

Benthic habitats and non-commercial biological communities offshore Virginia were surveyed 1996 and 1997 in the vicinity of potential sand mining activities, where borrow areas had been identified and in regions of possible future interest. Benthic surveys were conducted semi-annually, during which sediment profile imaging (SPI) and standard bottom photographic camera systems and Smith-MacIntyre grabs were deployed. The study area offshore Virginia extended from just inside the three-mile line to approximately 10 miles offshore, and from the latitude of the southern shore of Chesapeake Bay mouth (36.925° N) to a few miles south of Sandbridge, VA (36.675° N).

## FAUNA

### Avian

#### FEDERAL AGENCIES

**Organization:** National Park Service (NPS)

**Contact:** Patrick Flaherty

**Email:** Patrick\_flaherty@nps.gov

**Web address:** <http://science.nature.nps.gov/nrdata/metadata.cfm?ID=41296>

**Database name:** Bird Inventory of the Blue Ridge Parkway 2003-2004

**Description:** Document breeding, wintering and habitat locations of birds with point counts, transects and targeted surveys.

**Organization:** National Park Service (NPS)

**Contact:** Tammy Stidham

**Email:** Tammy\_Stidham@nps.gov

**Web address:** <http://science.nature.nps.gov/nrdata/datastore.cfm?ID=21722>

**Database name:** Breeding/nesting bird area – Greatfalls Park (GWMP)

**Description:** Data set contains the nesting and breeding bird area located in Great Falls park which is part of the George Washington Memorial Parkway in Virginia. Date: 1990

**Organization:** National Park Service (NPS)

**Contact:** Dennis Skidds

**Email:** dennis\_skidds@nps.gov

**Web address:** <http://science.nature.nps.gov/nrdata/datastore.cfm?ID=47239>

**Database name:** Field data for George Washington Birthplace National Monument Avian Inventory

**Description:** A comprehensive, year-round inventory of birds was conducted at George Washington Birthplace National Monument (GEWA) in 2002 and 2003. The inventory yielded 141 species documenting 96% of the species expected to occur. No listed threatened or endangered species were detected; although, the previously listed Bald Eagle (*Haliaeetus leucocephalus*) which nests on the park proper as well as on several surrounding properties, was observed frequently. A total of 24 species observed are recognized as species of special concern, species of management concern, or priority species under national conservation initiatives. The park's greatest asset is its proximity to Popes Creek, which is one of the most significant winter waterfowl concentration areas anywhere in the Bay for at least a few select species. It is also within the boundaries of a large wintering Bald Eagle concentration area that is roughly centered on the park. The fact that GEWA is located within a network of large farms also predisposes it to the full suite of open-land species that would not otherwise be found on such a small site. The park is facing numerous challenges in the future from issues ranging from the spread of invasive species to the effects of sea-level rise..

**Organization:** National Park Service (NPS)

**Contact:** GIS Specialist, Assateague Island National Seashore (ASIS)

**Email:** asis\_gis@nps.gov

**Web address:** <http://science.nature.nps.gov/nrdata/datastore.cfm?ID=43200>

**Database name:** Piping Plover Nest Locations on Assateague Island National Seashore, 1994-2005

**Description:** These data sets contain accurate information of Piping Plovers nest locations in the Maryland and Virginia districts at Assateague Island National Seashore from 1994-2005. Most of these points were collected using GPS.

**Organization:** United States Forest Service (USFS)

**Contact:** Steve Matthews

**Email:** matthews.204@osu.edu

**Web address:** <http://www.nrs.fs.fed.us/atlas/>

**Database name:** Climate Change Bird Atlas

**Description:** Changing forests mean changing habitat for the wildlife species that depend on them. The current and modeled distribution of 150 bird species is presented in the Climate Change Bird Atlas.

The current status and potential future status following climate change of 147 bird species in the eastern United States was assessed. Breeding Bird Survey data was used with 11 environmental variables and 88 tree species potential change data (see companion site <http://www.nrs.fs.fed.us/atlas/tree>) to generate

models of current suitable habitat for each species. The authors then change the climate according to three climate models (HADCM3, PCM & GFDL) and two emissions scenarios (A1FI (Hi) = little conservation efforts to mitigate CO2 emissions, B1 (Lo) = significant conservation effort), and model the potential future species habitats. These two emissions scenarios bracket most of the emission futures as outlined by the Intergovernmental Panel on Climate Change's evaluation of emission scenarios (Nakicenovic et al. 2000), and end the 21st century at roughly double (550 ppm-B1) and triple (970 ppm-A1fi) the pre-industrial levels for CO2.

**Organization:** United States Geological Survey (USGS)

**Contact:** John Sauer (Analyses Contact)

**Email:** John\_Sauer@usgs.gov

**Web address:** <http://www.pwrc.usgs.gov/BBS/>

**Database name:** North American Breeding Bird Survey (BBS)

**Description:** The North American Breeding Bird Survey is a cooperative effort between the U.S. Geological Survey's Patuxent Wildlife Research Center and the Canadian Wildlife Service's National Wildlife Research Centre to monitor the status and trends of North American bird populations. Following a rigorous protocol, BBS data are collected by thousands of dedicated participants along thousands of randomly established roadside routes throughout the continent. Professional BBS coordinators and data managers work closely with researchers and statisticians to compile and deliver these population data and population trend analyses on more than 400 bird species, for use by conservation managers, scientists, and the general public. Surveys 1966 to present (2007).

## REGIONAL ORGANIZATIONS

n/a

## STATE AGENCIES

**Organization:** Virginia Department of Game and Inland Fisheries (VaDGIF)

**Contact:** Sergio Harding

**Email:** Sergio.harding@dgif.virginia.gov

**Web address:** <http://www.dgif.virginia.gov/gis/gis-data.asp>

**Database name:** Important Bird Areas

**Description:** Important Bird Areas (IBAs) are areas within a state that support the most significant abundance and/or diversity of native birds or that support species of conservation concern. This data set represents one of the deliverables by the Virginia Important Bird Area (IBA) Program in fulfillment of its contract with the Virginia Department of Game and Inland Fisheries (VDGIF). The data set is the culmination of a 3 year effort to identify a significant portion of Virginia's IBAs. IBAs are nominated by interested parties and are then evaluated by the Technical Committee to determine whether they satisfy or exceed one or more of a set of criteria established by the Committee. Vote by the Technical Committee then leads to recognition or rejection of nominated IBAs. It is

estimated that approximately 80% of Virginia's IBAs, represented by this data set, have been identified to date. The IBA nomination process will be ongoing, and the boundaries of existing IBAs may be periodically reviewed and modified as new data become available.

The purpose of this data set is to provide a geographic representations of the designated boundaries of the first 19 recognized Virginia IBAs. These IBAs are recognized as being of importance for the conservation of viable populations of suites of avian species, and are the land units within which the Virginia IBA Program is focusing its planning and conservation efforts in collaboration with a host of partners. Publication date: 2007.

**Organization:** Virginia Department of Game and Inland Fisheries (VaDGIF)

**Contact:** Dave Morton

**Email:** dmorton@dgif.state.va.us

**Web address:**

[http://mercury.ornl.gov/metadata/nbii/html/cloakn/akn.ornith.cornell.edu\\_Metadata\\_a\\_va\\_dgif\\_d\\_bbatlas.html](http://mercury.ornl.gov/metadata/nbii/html/cloakn/akn.ornith.cornell.edu_Metadata_a_va_dgif_d_bbatlas.html)

**Database name:** Virginia Breeding Bird Atlas

**Description:** This dataset is statewide. It consists of a shapefile and associated data file that can be linked together. The shapefile contains USGS 1:24,000 7.5' topographic quadrangle blocks divided into six equal rectangles (1/6 quad) which were surveyed by volunteers. The data file contains data regarding species presence and behavior in these blocks during the 1985-1989 breeding seasons. The Breeding Bird Atlas Project was a cooperative project between the Virginia Department of Game and Inland Fisheries and the Virginia Society of Ornithology. The dataset is served up to the public through the Virginia Fish and Wildlife Information Service.

## OTHER ORGANIZATIONS

\*\*\*\*\*

### **Military Installations:**

Data obtained by searching the Natural Resources Monitoring Partnership (NRMP) web site:

[http://www.nbii.gov/portal/community/Communities/Toolkit/Natural\\_Resources\\_Monitoring\\_Partnership/Find\\_a\\_Project/](http://www.nbii.gov/portal/community/Communities/Toolkit/Natural_Resources_Monitoring_Partnership/Find_a_Project/)

**Organization:** Fort Belvoir

**Contact:** Chris Eberly

**Email:** ceberly@dodpif.org

**Web address:** n/a

**Database name:** Multi-season Avian Surveys at Fort Belvoir, Virginia

**Description:** Survey 1998 – 2006. The avifauna within the MACP is comprised of both northeastern and southeastern species that contributes to a high avian diversity (180 species that regularly breed). This diversity reflects the diverse array of habitats within the region, which includes pine savannahs, barrier and bay islands, salt marshes, forested wetlands, mixed upland forests, early successional grasslands / shrublands, pine plantations, and fresh / brackish emergent wetlands. Although populations of most species of birds within the region appear to be

secure, 30 species (16.7%) have declined significantly. A multi-season (winter, spring and summer) avian inventory and abundance study was initiated in the spring of 1998 and has been conducted annually through FY-04. The surveys were conducted by the U.S. Army Corps of Engineering Waterways Experiment Station (WES) with assistance from SpecPro until the winter of 2003 survey.

**Organization:** Fort Belvoir

**Contact:** Chris Eberly

**Email:** ceberly@dodpif.org

**Web address:** n/a

**Database name:** Waterfowl Survey at Fort Belvoir, Virginia

**Description:** The survey data are used to inventory and estimate waterfowl abundance, and to develop population trends during spring and fall migration and wintering seasons. This information is also provided to the Fort Belvoir Bird Aircraft Strike Hazard (BASH) program. Start date: 1998

**Organization:** Fort Lee Garrison, U.S. Army

**Contact:** Chris Eberly

**Email:** ceberly@dodpif.org

**Web address:** n/a

**Database name:** Wading Bird surveys at Fort Lee, Virginia

**Description:** Chesapeake Bay-wide Wading Bird Survey was conducted by Bryan Watts. This survey discovered a small colony on Fort Lee. That colony continues to be censused each year by Dana Bradshaw. Surveys began in 1993.

**Organization:** Langley Air Force Base

**Contact:** Chris Eberly

**Email:** ceberly@dodpif.org

**Web address:** n/a

**Database name:** Airfield Bird Monitoring Program at Langley AFB, Virginia

**Description:** The purpose of this program is designed to detect changes and habitat use of bird populations that pose a threat to flight safety. The program is also necessary to measure the effectiveness of management programs. Point-count surveys are conducted bi-monthly in order to determine bird species composition, daily and seasonal trends as well as geographic patterns that would indicate which species, times and places posed a significant threat to aviation safety. A systematic experimental design is used to sample birds at observation points, providing a clear view of wildlife attractants on and near the airfield. Bird abundance data and scientific literature is collected, analyzed, and reviewed quarterly. Annual bird abundance reports are prepared to support 1 USFWS Bird Aircraft Strike Hazard (BASH) and Integrated Natural Resource Management. Start date 1999.

**Organization:** Marine Corps Base Quantico

**Contact:** Chris Eberly

**Email:** ceberly@dodpif.org

**Web address:** n/a

**Database name:** Monitoring Avian Productivity and Survivorship (MAPS)  
Program at Marine Corps Base Quantico, Virginia

**Description:** With few exceptions, all birds captured during the course of the study were identified to species, age, and sex and, if unbanded, were banded with USGS/BRD numbered aluminum bands. Birds were released immediately upon capture and before being banded or processed if situations arose where bird safety would be compromised. Effort data, i.e., the number and timing of net-hours on each day (period) of operation, were also collected in a standardized manner. In order to allow constant-effort comparisons of data to be made, the times of opening and closing the array of mist nets and of beginning each net check were recorded to the nearest ten minutes. The breeding (summer residency) status (confirmed breeder, likely breeder, non-breeder) of each species seen, heard, or captured at each MAPS station on each day of operation was recorded using techniques similar to those employed for breeding bird atlas projects. Study period 1996 – 2005.

**Organization:** Naval Weapons Station Yorktown & VADGIF

**Contact:** Chris Eberly

**Email:** ceberly@dodpif.org

**Web address:** n/a

**Database name:** Bobwhite Quail Count in Virginia

**Description:** Knowledge of Northern bobwhite quail populations is inadequate in some regions. Reliable quail population trend information is currently not available in all regions of the state. In addition, the availability of suitable quail habitat has not been quantified on a large-scale. This information is needed to accurately monitor the effects of changing land use patterns, habitat management pro-grams, and regulatory changes on bobwhite quail populations. The purpose of this project is to increase knowledge of quail populations in regions with inadequate trend information and develop a system for monitoring changes in the availability of quail habitat statewide.

Along a ten mile route stops are made every mile and the number of quail detected is recorded. Data are contributed to a state database. Survey is conducted annually in the spring. Start date 1989. Data is not yet available.

\*\*\*\*\*

**Organization:** National Audubon Society

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.audubon.org/bird/cbc/index.html>

**Database name:** Audubon's Christmas Bird Count

**Description:** The Christmas Bird Count (CBC) is a long-standing program of the National Audubon Society. It is an early-winter bird census, where volunteers follow specified routes through a designated 15-mile (24-km) diameter circle, counting every bird they see or hear all day. It's not just a species tally—all birds

are counted all day, giving an indication of the total number of birds in the circle that day. All individual CBC's are conducted in the period from 14 December to 5 January (inclusive dates) each season, and each count is conducted in one calendar day. The first CBC was in 1900.

**Organization:** National Biological Information Infrastructure (NBII)

**Contact:** n/a

**Email:** n/a

**Web address:**

[http://www.nbio.gov/portal/server.pt?open=512&objID=895&&PageID=2556&mode=2&in\\_hi\\_userid=2&cached=true](http://www.nbio.gov/portal/server.pt?open=512&objID=895&&PageID=2556&mode=2&in_hi_userid=2&cached=true)

**Database name:** The Appalachian Cooperative Grouse Research Project

**Description:** Ruffed grouse populations have been declining throughout the Appalachian region for several decades. The Appalachian Cooperative Grouse Research Project (ACGRP) was established in 1996 by state natural resources agencies in the region to investigate potential factors limiting ruffed grouse populations. Hunting, particularly late season impacts, has been suggested as a potential cause of declining grouse numbers. Additionally, wildlife managers have suggested that the quantity and quality of ruffed grouse habitat have declined in recent decades. Data were collected on 3,118 ruffed grouse captured on the study areas from September 1996 through October 2002.

Researchers currently have several manuscripts presenting the results and findings of the ACGRP in preparation and review for publication in scientific, peer-reviewed journals and a semi-technical book summarizing the major findings of the project. Until these manuscripts are published access to the raw data is limited to ACGRP personnel. Access to the ACGRP database and metadata will be available to ACGRP personnel and the public in the future.

**Organization:** Partners in Flight

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.partnersinflight.org/>

**Database name:** Partners in Flight Species Assessment Database

**Description:** Partners In Flight (PIF) is a partnership of federal and state agencies, industry, non-governmental organizations, and many others, with the goal of conserving North American birds. In 1991, PIF began developing a formal species assessment process that could provide consistent, scientific evaluations of conservation status across all bird species in North America, and identify areas most important to the conservation of each species. This process applies quantitative rule sets to complex biological data on the population size, distribution, population trend, threats, and regional abundance of individual bird species to generate simple numerical scores that rank each species in terms of its biological vulnerability and regional status. The process results in global and regional conservation assessments of each bird species that, among other uses, can be used to objectively assign regional and continental conservation priorities among birds.

**Organization:** William and Mary - Center for Conservation Biology  
**Contact:** Bryan Watts  
**Email:** bdwatt@wm.edu  
**Web address:** [http://ccb.wm.edu/programs/migration/programs\\_kiptopeke.htm](http://ccb.wm.edu/programs/migration/programs_kiptopeke.htm)  
**Database name:** Kiptopeke Bird Banding Station  
**Description:** Banding data are compiled annually in station summaries. Annual summaries from 2002 on are available online for download. For more than 4 decades the station has collected valuable information on bird populations migrating along the Atlantic Coast. The station is currently operated by the Coastal Virginia Wildlife Observatory in collaboration with the Center for Conservation Biology and the Virginia Department of Conservation and Recreation with funding from various sources.  
The Kiptopeke Banding Station was established in 1963 as part of a network of fall banding stations under the project "Operation Recovery."

**Organization:** William and Mary - Center for Conservation Biology  
**Contact:** Bryan Watts  
**Email:** bdwatt@wm.edu  
**Web address:** <http://www.ccb-wm.org/nightjar/Results.htm>  
**Database name:** Southeastern U.S. Nightjar Survey  
**Description:** The Nightjar Survey Network is a new and powerful annual monitoring strategy, coordinated by The Center for Conservation Biology, to collect information on population distribution and trends of Nightjars over large regions. Nightjar survey routes are distributed throughout 37 U.S. states. Survey began in 2007 for Virginia.

**Organization:** William and Mary - Center for Conservation Biology  
**Contact:** Bryan Watts  
**Email:** bdwatt@wm.edu  
**Web address:** <http://ccb.wm.edu/vafalcons/falconhome.cfm>  
**Database name:** Virginia Falcons  
**Description:** This site is focused on the peregrine falcon population that breeds in Virginia. Center staff have spearheaded the release of more than 250 falcons in the state, constructed dozens of nesting structures, conducted annual surveys of the population, and monitored the success of breeding pairs. Since the early 1980's, Virginia's breeding population has made a slow but steady recovery.

## **Fish/Shellfish**

### *FEDERAL AGENCIES*

**Organization:** National Oceanic and Atmospheric Administration (NOAA) - Fisheries  
**Contact:** Fisheries Statistics Division  
**Email:** n/a  
**Web address:** <http://www.st.nmfs.noaa.gov/st1/>

**Database name:** Recreational fisheries and commercial fisheries

**Description:** The Fisheries Statistics Division collects data and coordinates information and research programs to support the science-based stewardship of the nation's living marine resources. In addition to integrating and disseminating state and federal statistics about marine fisheries, we administer the surveys used to estimate recreational landings.

**Organization:** NOAA's National Centers for Coastal Ocean Science (NCCOS) - Center for Coastal Monitoring and Assessment (CCMA)

**Contact:** n/a

**Email:** n/a

**Web address:**

[http://www8.nos.noaa.gov/cit/nsandt/download/mw\\_monitoring.aspx](http://www8.nos.noaa.gov/cit/nsandt/download/mw_monitoring.aspx)

**Database name:** Monitoring Data – Mussel Watch

**Description:** The longest continuous contaminant monitoring program in U.S. coastal waters. The project analyzes chemical and biological contaminant trends in sediment and bivalve tissue collected at over 280 coastal sites from 1986 to present. The database includes: sediment and bivalve tissue chemistry for over 100 organic and inorganic contaminants; bivalve histology; and *Clostridium perfringens* data.

**Organization:** National Park Service (NPS)

**Contact:** Sara Stevens

**Email:** n/a

**Web address:** <http://science.nature.nps.gov/nrdata/datastore.cfm?ID=46008>

**Database name:** Field Survey Data for Fish Inventories of Mid-Atlantic and Northeast Coastal and Barrier Network Parks within Virginia, Maryland and Pennsylvania

**Description:** This database contains field survey data from fish inventories carried out in 11 national parks: Appomattox Court House National Historical Park (APCO), Booker T. Washington National Monument (BOWA), Eisenhower National Historic Site (EISE), Fredericksburg and Spotsylvania National Military Park (FRSP), Gettysburg National Military Park (GETT), George Washington Birthplace National Monument (GEWA), Hopewell Furnace National Historic Site (HOFU), Petersburg National Battlefield (PETE), Richmond National Battlefield Park (RICH), Thomas Stone National Historic Park (THST), and Valley Forge National Historical Park (VAFO). EWA and THST are in the National Park Service's Northeast Coastal and barrier Network (NCBN); the other nine parks are in the Mid-Atlantic Network (MIDN). Data for all parks collected between 08/07/2002 and 06/20/2005.

## REGIONAL ORGANIZATIONS

n/a

## STATE AGENCIES

**Organization:** Virginia Department of Game and Inland Fisheries (VaDGIF)

**Contact:** Dave Morton

**Email:** dmorton@dgif.state.va.us

**Web address:** <http://www.dgif.virginia.gov/gis/gis-data.asp>

**Database name:** Anadromous Fish Use Areas

**Description:** This dataset identifies stream reaches that are confirmed or potential migration pathways, spawning grounds, or nursery areas for anadromous fish. The species included in this assessment are alewife, blueback herring (*Alosa aestivalis*), American shad (*A. sapidissima*), hickory shad (*A. mediocris*), striped bass (*Morone americana*), and some populations of yellow perch (*Perca flavescens*). Certain time-of-year restrictions apply to areas used by anadromous fish. Data associated with each reach include stream name, reach length, status (confirmed or potential), species confirmed in the reach (if confirmed), watershed, and upstream boundary. Upstream boundaries were established at impediments or where habitat became unsuitable. Date: 1970 - 2003

**Organization:** Virginia Department of Game and Inland Fisheries (VaDGIF)

**Contact:** John Odenkirk

**Email:** john.odenkirk@dgif.Virginia.gov

**Web address:** n/a

**Database name:** Northern Snakeheads in the Tidal Potomac

**Description:** A population of snakeheads was documented within a 23-km tidal reach of the mainstem freshwater Potomac in 2004. Snakeheads were collected with a variety of gear to determine population structure, abundance, distribution, and preferred habitat. Sampling is ongoing.

**Organization:** Virginia Marine Resources Commission (VMRC)

**Contact:** Jim Wesson

**Email:** web.info@mrc.virginia.gov

**Web address:** <http://www.mrc.state.va.us/fmac/fmoverview.shtm>

**Database name:** Oyster monitoring, fisheries and blue crab monitoring

**Description:** The Fisheries Management Division carries out current and long-term State policies effecting saltwater fisheries--recreational and commercial in Virginia's tidal waters. The Division's goal is to provide the maximum benefit and long-term use of the Commonwealth's finfish and shellfish resources through conservation and enhancement. Its objectives are: 1) to collect comprehensive and timely statistics and information on Virginia's fisheries to determine fishery stock conditions; 2) to develop fisheries management plans for commercially and recreationally important species found in Virginia waters; 3) to promote recreational fishing activity by the development of artificial fishing reefs and the Virginia Saltwater Fishing Tournament; and 4) to participate in organizations at the interstate and federal level regarding Virginia's fisheries and their management.

Fishermen report daily harvest monthly. Oyster data are gathered from a mandatory Oyster Tax and Harvest Reporting system. These data are entered into computers in the Plans/Statistics office where they can be quickly sorted and

retrieved to help in decision making or to respond to data requests from individuals, universities, or other resource management agencies. The Plans/Statistics staff has developed many computer databases for the Marine Fisheries Statistics System, and is participating in the setting up of the federal Northeast Marine Fisheries Information System.

## OTHER ORGANIZATIONS

**Organization:** Virginia Institute of Marine Science (VIMS)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.vims.edu/GreyLit/VIMS/ssr026.pdf>

**Database name:** Fishes and fish larvae collected from Atlantic plankton cruises of R/V Pathfinder, December 1959-December 1960

**Description:** Massmann, WH, J.J. Norcross, E.B. Joseph. 1961. Fishes and fish larvae collected from Atlantic plankton cruises of R/V Pathfinder, December 1959-December 1960. Special Scientific Report No. 26. Virginia Fisheries Laboratory. 16p. Data tables within the report list the species captured by month.

**Organization:** Virginia Institute of Marine Science (VIMS)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.vims.edu/GreyLit/VIMS/ssr033.pdf>

**Database name:** Fishes and fish larvae collected from Atlantic plankton cruises of R/V Pathfinder, March 1961-March 1962

**Description:** Massman, WH. 1962. Fishes and fish larvae collected from Atlantic plankton cruises of R/V Pathfinder, March 1961-March 1962. Special Scientific Report no. 33. Virginia Institute of Marine Science. 21p. The report list the young fishes and fish larvae obtained by plankton collecting gear.

**Organization:** Virginia Institute of Marine Science (VIMS)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.fisheries.vims.edu/rawlseine/links.htm>

**Database name:** Other VIMS surveys

**Description:** American Eel survey; Blue Crab Winter Dredge Survey (with Maryland); Chesapeake Bay Trophic Laboratory Services; Juvenile Striped Bass Seine Survey; Summer Flounder Tagging Project; ChesMMAP Trawl Survey

**Organization:** Virginia Institute of Marine Science (VIMS)

**Contact:** Roger Mann

**Email:** rmann@vims.edu

**Web address:** <http://www.vims.edu/env/> or

<http://www.vims.edu/mollusc/monrestoration/monoyster.htm#monpog>

**Database name:** Oyster Monitoring

**Description:** The Virginia Institute of Marine Science (VIMS) has maintained an active oyster monitoring program in Virginia waters since the 1940s. A majority of these data were collected as part of either the VIMS Spatfall Survey or the VIMS Dredge Survey. The results of these surveys have been and continue to be described in the VIMS annual oyster monitoring reports.

**Organization:** Virginia Institute of Marine Science (VIMS)

**Contact:** Troy Tuckey

**Email:** tuckey@vims.edu

**Web address:** <http://www.fisheries.vims.edu/multispecies/chesmmap/data.htm>

**Database name:** Trawl Survey Database

**Description:** Until 1987 data were manually recorded in the field then entered into a database at the lab. Most fish would have to be preserved in the field and brought back to the lab to be measured. In 1988 the survey began using electronic measuring boards connected to a computer running a database program; this allowed the survey to work more efficiently. The operator places a fish or crab on the board and touches a magnetic wand to the board at the end of the fish's tail/edge of shell; the length is electronically recorded. This process speeds measuring and eliminates the need for manual recording and entry of fish/crab lengths. Animals are returned to the water quickly and data are available for analysis within a couple of days of the field work. In addition to animal lengths, hydrographic and station data are also collected. These data include latitude and longitude, depth, tidal current stage, secchi depth, air temperature, wind direction, wind speed, weather conditions, sea state, water temperature, salinity and dissolved oxygen.

**Organization:** Virginia Tech – Conservation Management Institute (CMI)

**Contact:** Scott Klopfer

**Email:** sklopfer@vt.edu

**Web address:** <http://www.cmiweb.org/projectpage.aspx?projectid=46>

**Database name:** Menhaden Aerial Survey

**Description:** The Conservation Management Institute has teamed up with the Maryland Department of Natural Resources and the National Oceanic and Atmospheric Administration (NOAA) to devise a system using aerial videography to monitor menhaden fish populations in the Chesapeake Bay. Period of survey: July 2008 to October 2008.

## Insects

### FEDERAL AGENCIES

**Organization:** National Park Service (NPS)

**Contact:** Anne Chazal

**Email:** anne.chazal@dcr.virginia.gov

**Web address:** <http://science.nature.nps.gov/nrdata/datastore.cfm?ID=44575>

**Database name:** Lepidoptera and Odonata Survey Data from George Washington Birthplace National Monument and Colonial National Historical Park

**Description:** In 2003, the National Park Service contracted with the Virginia Department of Conservation and Recreation, Division of Natural Heritage (DCR-DNH) to conduct an inventory of the diurnal Lepidoptera and Odonata on George Washington Birthplace National Monument (GEWA), Westmoreland County, Virginia and Colonial National Historical Park (COLO), located in James City, Surry, and York counties, Virginia. Between May-July 2003 and April-October 2004, DCR-DNH conducted surveys. At George Washington Birthplace, 51 species of Lepidoptera and 37 species of Odenata were observed. In the Colonial National Historical Park, 57 species of Lepidoptera and 42 species of Odenata were observed. The globally rare skipper, bulenta (Rare Skipper G2G3 S1), was reconfirmed at an existing site in Colonial National Historical Park, but no further occurrences were found during targeted surveys for that species. Five watchlisted species were observed in Colonial National Historical Park: Aaron's Skipper (*Poanes aaroni*), Comet Darner (*Anax longipes*), Blue-faced Meadowhawk (*Sympetrum ambiguum*), Furtive Forktail (*Ischnura prognata*), and Duckweed Firetail (*Telebasis byersi*). All of these watchlisted species are considered common to very common and secure across their global ranges. Three watchlisted species were observed in George Washington Birthplace National Monument: Aaron's Skipper (*Poanes aaroni*), Comet Darner (*Anax longipes*), and Elegant Spreadwing (*Lestes inaequalis*). All of these species are considered common to very common and secure across their global ranges.

**Organization:** National Park Service (NPS)

**Contact:** GIS Specialist, Prince William Forest Park

**Email:** n/a

**Web address:** <http://science.nature.nps.gov/nrdata/datastore.cfm?ID=21992>

**Database name:** Prince William Forest Park Gypsy Moth defoliation 1991

**Description:** This coverage represents areas where Gypsy Moths have defoliated oak trees in the summer of 1991 in Prince William Forest Park. Data also available for 1992. Gypsy Moth spray project data available for 1993 and 1994.

## REGIONAL ORGANIZATIONS

n/a

## STATE AGENCIES

**Organization:** Virginia Department of Forestry (VaDOF)

**Contact:** Mindia Brown

**Email:** Mindia.Brown@dof.virginia.gov

**Web address:** <http://www.dof.virginia.gov/gis/datadownload.shtml>

**Database name:** Fall Cankerworm (2002), Gypsy Moth Defoliation (2002) & (2003)

**Description:** The Fall Cankerworm dataset includes polygons of hardwood tree defoliation caused by larvae of the fall cankerworm, a native inchworm. Limited to extensive outbreaks of this insect occur somewhere in Virginia every few years and last from one to several years. They are more common in the mountains, but

occur in piedmont and coastal plain areas as well. Polygons are delimited mostly by aerial sketch mapping, but ground surveys are also used. Data for this layer were collected 5/31/02.

This Gypsy Moth dataset includes polygons of tree defoliation caused by gypsy moth caterpillars. They are delimited annually on 1:100,000 scale maps by aerial observers in small aircraft from altitudes of 1000 to 1500 feet above ground level. Data for these layers were collected 6/22/02 and 6/03.

## OTHER ORGANIZATIONS

**Organization:** Virginia Tech

**Contact:** Andy Roberts

**Email:** roberts@vt.edu

**Web address:** <http://fubyss.ento.vt.edu/vagm/> or  
<http://www.gmsts.org/operations/products/>

**Database name:** Gypsy Moth trapping database

**Description:** The Slow the Spread (STS) Project is a large IPM project directed at the gypsy moth. The project, under the aegis of the US Forest Service, involves several administrative agencies at both state and federal levels. Participating states include Indiana, Illinois, Kentucky, Michigan, North Carolina, Ohio, Virginia, West Virginia, and Wisconsin

## Other Fauna

### FEDERAL AGENCIES

**Organization:** National Oceanic and Atmospheric Administration (NOAA)

**Contact:** n/a

**Email:** n/a

**Web address:** [http://www.sefsc.noaa.gov/PDFdocs/TechMem\\_SEC492-complete.pdf](http://www.sefsc.noaa.gov/PDFdocs/TechMem_SEC492-complete.pdf)

**Database name:** A Marine Mammal Assessment Survey of the Southeast US Continental Shelf: February – April 2002

**Description:** Garrison, L.P., *et al.* 2002. A Marine Mammal Assessment Survey of the Southeast US Continental Shelf: February – April 2002. NOAA Technical Memorandum NOAA FISHERIES-SEFSC-492, 50 p.

A visual line transect survey was conducted of the mid-Atlantic continental shelf and inner slope waters from Northern Florida to Delaware Bay to determine the abundance and spatial distribution of marine mammals. The report summarizes the survey data in tables.

**Organization:** National Park Service (NPS)

**Contact:** Dennis Skidds

**Email:** dennis\_skidds@nps.gov

**Web address:** <http://science.nature.nps.gov/nrdata/datastore.cfm?ID=44571>

**Database name:** Field Data for the Inventory of Amphibians and Reptiles of Colonial National Historical Park, George Washington Birthplace National Monument and Thomas Stone National Historic Site

**Description:** This database contains data collected from 3/13/2001 to 8/5/2003 at Colonial National Historical Park, George Washington Birthplace National Monument and Thomas Stone National Historic Site for an inventory of amphibians (frogs and salamanders) and reptiles (turtles, lizards and snakes). Survey methods included visual encounter surveys, audio surveys, road surveys, dipnets, minnow traps and turtle traps.

**Organization:** National Park Service (NPS)

**Contact:** Geoffrey Sanders

**Email:** geoffrey\_sanders@nps.gov

**Web address:** <http://science.nature.nps.gov/nrdata/datastore.cfm?ID=41588>

**Database name:** NCRN All Herps Sites

**Description:** Select parks in the Nations Capitol Region of the National Park Service were inventoried for the present of amphibians and reptiles. Spatial data were collected for each specimen observed. Habitat types were designated for each park and these habitats were searched to locate as many species as possible. Surveyed 2002-2004.

**Organization:** National Park Service (NPS)

**Contact:** GIS Specialist, Prince William Forest Park

**Email:** n/a

**Web address:** <http://science.nature.nps.gov/nrdata/datastore.cfm?ID=21989>

**Database name:** Prince William Forest Park Deer sites

**Description:** Deer sites within Prince William Forest Park. Date 1990

## REGIONAL ORGANIZATIONS

**Organization:** Alliance for the Chesapeake Bay

**Contact:** n/a

**Email:** mail@acb-online.org

**Web address:** <http://www.acb-online.org/project.cfm?vid=247>

**Database name:** Amphibian Monitoring Project

**Description:** In 2004, the Alliance piloted an amphibian monitoring program to test the extension of its successful citizen monitoring program to include monitoring options for Chesapeake Bay habitats and wildlife. Frogwatch USA's monitoring protocols and online resources are used. Data is available from Frogwatch USA: <http://www.nwf.org/frogwatchUSA/> and from Chesapeake Bay & Mid-Atlantic from Space online viewer:

<http://chesapeake.towson.edu/mapping/advancedims.asp>

## STATE AGENCIES

**Organization:** Virginia Department of Game and Inland Fisheries (VaDGIF)

**Contact:** John Kleopfer

**Email:** john.kleopfer@dgif.state.va.us

**Web address:** <http://www.dgif.virginia.gov/WILDLIFE/frogsurvey/> or

<http://www.pwrc.usgs.gov/naamp/>

**Database name:** Virginia Frog and Toad Calling Survey

**Description:** The North American Amphibian Management Program (NAAMP) is a collaborative effort among regional partners, such as state natural resource agencies and nonprofit organizations, and the U.S. Geological Survey (USGS) to monitor populations of vocal amphibians. The USGS provides central coordination and database management. The regional partners recruit and train volunteer observers to collect amphibian population data, following the protocol of the NAAMP. In Virginia, the Frog and Toad Calling Survey is conducted by a group of volunteers from across the Commonwealth who spend three nights a year surveying various wetland habitats for frogs and toads. The survey involves listening and then identifying the various species by their call, and recording the approximate number of individuals. Each route has 10 stops. The surveys take place once in late winter, once in the spring, and one more time in early summer. The Wildlife Diversity Division of the Virginia Department of Game and Inland Fisheries (VDGIF) has participated in the NAAMP since 1999.

Assess to data can be found on the North American Amphibian Monitoring Program web site: <http://www.pwrc.usgs.gov/naamp/>

## OTHER ORGANIZATIONS

**Organization:** NatureServe

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.natureserve.org/getData/animalData.jsp>

**Database name:** Animal data for download

**Description:** NatureServe compiles and maintains extensive data on the animals of the United States, Canada, and the entire Western Hemisphere. These data focus on the taxonomy, natural history, distribution, and conservation status of vertebrates and selected invertebrates. The following downloadable datasets are available: Digital Distribution Maps of the Birds of the Western Hemisphere; Digital Distribution Maps of the Mammals of the Western Hemisphere; Digital Distribution Maps of the World's Amphibians; Distribution of Native U.S. Fishes by Watershed

**Organization:** Virginia Coast Reserve Long-Term Ecological Research Project

**Contact:** John Porter

**Email:** jhp7e@virginia.edu

**Web address:** [http://www.vcrlter.virginia.edu/cgi-bin/w3-msql2/data/query/datasets/show\\_data.html?QDATA\\_ID=RDD6B7501A](http://www.vcrlter.virginia.edu/cgi-bin/w3-msql2/data/query/datasets/show_data.html?QDATA_ID=RDD6B7501A)

**Database name:** Survey of island small mammals – trapping data

**Description:** This study was designed to characterize the distribution of small mammal species on the Virginia Barrier Islands. Trapping was conducted from 1975 to 1977 on barrier islands south of Paramore.

**Organization:** Virginia Tech – Conservation Management Institute (CMI)

**Contact:** Eric D. Wolf

**Email:** ewolf6@vt.edu

**Web address:** <http://www.cmiweb.org/projectpage.aspx?projectid=48>

**Database name:** Mammal survey on SMR Camp Pendelton

**Description:** Military installations are tasked with conducting planning level surveys that allow for the creation of species lists. Planning level surveys are critical for determining the potential impact of projects and management decisions on the collection of biologic communities on military installations. Detailed knowledge of the biologic resources on an installation can assist military natural resource managers make informed decisions and avoid potential conflicts with military training and/or critical construction projects. Working with the Virginia Department of Military Affairs - Environmental, CMI is documenting mammal species occurring at State Military Reservation-Camp Pendelton located just south of Virginia Beach. Biologists at CMI are using a variety of methods including live trapping, track plates, spot lighting, acoustic monitoring, and camera traps to record the species and habitat associations of mammals that occur on the installation. Period of survey: February 2008 to March 2009.

## FLORA

### *FEDERAL AGENCIES*

**Organization:** National Park Service (NPS)

**Contact:** Geoffrey Sanders

**Email:** geoffrey\_sanders@nps.gov

**Web address:** <http://science.nature.nps.gov/nrdata/datastore.cfm?ID=47065>

**Database name:** Prince William Forest Park 2003-2004 Floristic Survey.

**Description:** The Biology Department of George Mason University conducted a floristic survey in Prince William Forest Park, in Prince William County, Virginia, during the 2003 and 2004 growing seasons. The purpose of the survey was to locate and identify as many of the naturally growing vascular plant species in the Park as possible, with a goal of listing 90 percent of these species. The 90 percent goal was estimated to be 652 species; 743 species were located and identified. With two varieties each found for four of the species, the taxa count was 747. No plants on the Virginia Rare Plant List were found; two Virginia Watch List plants were found. All plant locations were logged with a Global Positioning Receiver, and an indication of the site quality and the abundance of the plant at the site were noted. Many of the species were identified in the field with no voucher being collected. For the 747 taxa, 339 voucher specimens were collected; an additional 229 vouchers were collected and identified as duplicates. All voucher specimens are currently at GMU. It is concluded that most plant

species expected at Prince William Forest Park are present, but in many cases they are relatively sparse and difficult to locate.

**Organization:** U.S. Fish and Wildlife Service (USFWS)

**Contact:** n/a

**Email:** Wetlands\_Team@fws.gov

**Web address:** <http://www.fws.gov/wetlands/>

**Database name:** National Wetlands Inventory (NWI)

**Description** This data set represents the extent, approximate location and type of wetlands and deepwater habitats in the conterminous United States. These data delineate the areal extent of wetlands and surface waters as defined by Cowardin et al. (1979).

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and near shore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

By policy, the Service also excludes certain types of "farmed wetlands" as may be defined by the Food Security Act or that do not coincide with the Cowardin et al. definition. Contact the Service's Regional Wetland Coordinator for additional information on what types of farmed wetlands are included on wetland maps.

The present goal of the Service is to provide the citizens of the United States and its Trust Territories with current geospatially referenced information on the status, extent, characteristics and functions of wetlands, riparian, deepwater and related aquatic habitats in priority areas to promote the understanding and conservation of these resources.

**Organization:** U.S. Fish and Wildlife Service (USFWS)

**Contact:** Gary Norman

**Email:** Gary.Norman@dgif.virginia.gov

**Web address:**

[http://www.nbii.gov/portal/server.pt?open=512&objID=893&&PageID=2544&mode=2&in\\_hi\\_userid=2&cached=true](http://www.nbii.gov/portal/server.pt?open=512&objID=893&&PageID=2544&mode=2&in_hi_userid=2&cached=true)

**Database name:** Northeast Regional Hard Mast Survey

**Description:** Hard mast (i.e., acorns and nuts) is a critical food resource for a variety of wildlife species in the eastern U.S. The northeast regional mast survey is a cooperative effort initiated in 1995 by the Wild Turkey Technical Committee of the Northeastern Association of Fish and Wildlife Agencies. The goal of this survey is to provide regional information about annual hard mast production to aid in the management of wild turkey and other wildlife in the northeastern United States.

All data collected as part of the Northeast Regional Mast Survey is available to the general public. In order to continually improve the usefulness of

the survey and data, persons downloading data from this webpage are asked to log in and provide basic information about their affiliation and how they intend to use the data. Personal data is not requested or required to download data.

**Organization:** United States Forest Service (USFS)

**Contact:** Anantha Prasad

**Email:** [aprasad@fs.fed.us](mailto:aprasad@fs.fed.us)

**Web address:** <http://www.nrs.fs.fed.us/atlas/>

**Database name:** **Climate Change Tree Atlas**

**Description:** As the reality of global climate change becomes increasingly apparent to the public and to many policymakers, scientists are being called on to provide information about possible outcomes. Dr. Louis Iverson and Anantha Prasad began modeling and mapping tree species from the eastern United States for their potential response to several scenarios of climate change around 1996. Their first climate change atlases for trees and birds examined 80 tree species. Then they joined with Stephen Matthews and Raymond O'Connor (now deceased) to produce a change atlas for 150 bird species. Now, along with Matthew Peters, they have expanded their tree analysis to 134 species at 20 km resolution, using more accurate modeling tools and newer climate models (GCMs).

The current status and potential future status following climate change of 134 tree species in the eastern United States was assessed. US Forest Service inventory data was used with 38 environmental variables to generate models of current suitable habitat for each species. The authors then change the climate according to three climate models (HADCM3, PCM & GFDL) and two emissions scenarios (A1FI (Hi) = little conservation efforts to mitigate CO2 emissions, B1 (Lo) = significant conservation effort), and model the potential future species habitats.

**Organization:** United States Geological Survey (USGS)

**Contact:** Robert Thompson

**Email:** [rthompson@usgs.gov](mailto:rthompson@usgs.gov)

**Web address:** <http://esp.cr.usgs.gov/data/atlas/little/>

**Database name:** **Digital representations of Tree Species Range maps**

**Description:** Maps of the ranges of tree species in North America compiled by Elbert Little, of the U.S. Department of Agriculture, Forest Service, and others were digitized for use in USGS' vegetation-climate modeling studies. These digital map files are available for download. The maps are available in ArcView® shapefile format. Geographic ranges are represented as polygons. There is one shapefile (with associated data files) for each tree species.

## *REGIONAL ORGANIZATIONS*

n/a

## *STATE AGENCIES*

**Organization:** Virginia Department of Forestry (VaDOF)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.dof.virginia.gov/econ/data.shtml>

**Database name:** Forest Harvest

**Description:** Harvest value data provided in tabular form for each county in Virginia (1986-2001).

**Organization:** Virginia Department of Forestry (VaDOF)

**Contact:** John Scrivani

**Email:** n/a

**Web address:** <http://www.dof.virginia.gov/resinfo/index-fia.shtml> or

<http://fia.fs.fed.us>

**Database name:** Forest Inventory and Analysis (FIA)

**Description:** Collected since 1940. Collection dates of 1940, 1957, 1966, 1972, 1986, 1992, & annually since 1997. FIA reports on status and trends in forest area and location; in the species, size, and health of trees; in total tree growth, mortality, and removals by harvest; in wood production and utilization rates by various products; and in forest land ownership

**Organization:** Virginia Department of Forestry (VaDOF)

**Contact:** Jim Pugh

**Email:** jim.pugh@dof.virginia.gov

**Web address:** <http://www.dof.virginia.gov/gis/datadownload.shtml>

**Database name:** Virginia Forest Cover 2005

**Description:** The 2005 edition of the Virginia Forest Cover Map (VFCM 2005) was developed to identify forest in Virginia as defined by the United States Forest Service (USFS) Forest Inventory and Analysis (FIA) Program. FIA forest has or formerly had at least a 10% stocking of live forest trees of any size and is not currently developed for non-forest use. The minimum area for classification as forest is 1 acre with a minimum width of 120 feet stem-to-stem. Forested strips must be at least 120 feet wide for a continuous length of at least 363 feet in order to meet the 1 acre minimum. Unimproved roads, trails, and other clearings in forest areas are classified as forest if less than 120 feet wide or smaller than 1 acre.

**Organization:** Virginia Department of Forestry (VaDOF)

**Contact:** Mindia Brown

**Email:** mindia.brown@dof.virginia.gov

**Web address:** <http://www.dof.virginia.gov/gis/datadownload.shtml>

**Database name:** Virginia Tree Cover 2000

**Description:** VATREE is a map of forestland in Virginia developed through the classification of Landsat 7 ETM+ satellite imagery acquired in the years 1999 and 2000, and using the Iterative Guided Spectral Class Rejection process. It was further refined using various ancillary data sets and algorithms. Classification training and accuracy assessment was done using over 7,000 Forest Inventory and Analysis (FIA) ground data plots. VATREE was developed primarily to provide

stratification for the estimation of forestland area. It may additionally be used as an image mask for forest type classification or as a baseline for forest health, disturbance and harvest monitoring.

## *OTHER ORGANIZATIONS*

**Organization:** Virginia Institute of Marine Science (VIMS)

**Contact:** n/a

**Email:** n/a

**Web address:** [http://web.vims.edu/bio/sav/gis\\_data.html](http://web.vims.edu/bio/sav/gis_data.html)

**Database name:** **Submerged Aquatic Vegetation (SAV)**

**Description:** Chesapeake Bay SAV data were mapped from aerial photography, primarily at a scale of 1:24,000, for the following regions: western shore, Va. only - 1971 & 1974; lower Bay, Va. only - 1980 & 1981; upper Bay, selected sections, 1979; Baywide, 1978, 1984 - 1987, and 1989 - 2007. Each area of SAV was classified into one of four density classes by the percentage of cover as determined from the aerial photography (methodology is described in each annual report - e.g. see Orth et al., 2008). The SAV beds are stored as ArcInfo GIS coverages using the quality control procedures documented in the individual metadata files. Data were collected by the Virginia Institute of Marine Science and can be attributed by including a reference to the associated annual SAV distribution and abundance report.

## *COMBINED BIOLOGICAL FEDERAL AGENCIES*

**Organization:** NOAA's National Marine Fisheries Service

**Contact:** Northeast Fisheries Science Center, Woods Hole

**Email:** n/a

**Web address:** <http://www.nefsc.noaa.gov/pbio/fwdp/database.htm>

**Database name:** **NEFSC Bottom Trawl Survey Program**

**Description:** The Food Web Dynamics Program (FWDP) has two major sources of data. The first, and most extensive, is the standard NEFSC Bottom Trawl Survey Program. During these surveys, food habits data are collected for a variety of species. These multi-species surveys were designed to monitor trends in abundance and distribution and to provide data and samples to study the ecology of the large number of fish and invertebrate species inhabiting the region.

Additionally, "process-oriented" cruises are conducted periodically to address specific questions related to the feeding ecology of the fish in the ecosystem. Both sources provide primarily stomach content information; composition, total and individual prey weights or volumes, and length of prey. Additional information associated with each fish predator is also collected. Other databases encompass the prey fields of these fish, and include zooplankton, ichthyoplankton, and benthic surveys.

The broad scale trawl surveys cover continental shelf waters from Cape Hatteras, NC to Nova Scotia, and extend from 1963 to present; however only qualitative food habits data were collected from 1963 to 1972. The sampling program was initiated in the autumn of 1963; a spring survey was initiated in 1968; seasonal surveys have also been conducted in summer and winter on an intermittent basis.

## *REGIONAL ORGANIZATIONS*

n/a

## *STATE AGENCIES*

**Organization:** Virginia Department of Forestry (VaDOF)

**Contact:** Chris Asaro

**Email:** Chris.Asaro@dof.virginia.gov

**Web address:** <http://www.dof.virginia.gov/health/index.shtml>

**Database name:** Forest Health

**Description:** gypsy moth, southern pine beetle, etc

## *OTHER ORGANIZATIONS*

**Organization:** National Agricultural Pest Information System (NAPIS)

**Contact:** Debra Martin (VA State Survey Coordinator (804) 786-3515

**Email:** debra.martin@vdacs.virginia.gov

**Web address:** <http://pest.ceris.purdue.edu/index.php>

**Database name:** NAPIS pest tracker

**Description:** The National Agricultural Pest Information System (NAPIS) stores and manages pest survey data that is collected by CAPS and other PPQ survey programs. Detection surveys are one tool used to manage the introduction of exotic pests.

**Organization:** University of Virginia (UVA) – Blandy Experimental Farm

**Contact:** Manuel Lerdaу

**Email:** mlerdaу@virginia.edu

**Web address:** <http://www.virginia.edu/blandy/>

**Database name:** Avian and butterfly surveys, etc

**Description:** The University of Virginia's Blandy Experimental Farm (BEF) is a 700 acre field station located in the northeastern Shenandoah Valley near Winchester, VA. Within the one square mile area are the Orland E. White Arboretum (The State Arboretum of Virginia), and representative habitats of the region that combine to create a microcosm of biological diversity unsurpassed in the mid-Atlantic region. The theme for the research program is the ecology of agroecosystems (defined here as the patchwork mosaic of natural remnant habitats that exist within a larger agricultural context). Research that focuses on the biology and ecology of species, habitats, communities, and even whole ecosystems within this matrix is supported.

Potential datasets: MAPS (monitoring avian productivity and survivorship) monitored at Blandy since 2002 go to:  
<http://people.virginia.edu/~dec5z/maps.html> ; Butterfly surveys go to:  
<http://www.virginia.edu/blandy/ClarkeCountyLandUseSurvey/ccmapping.htm> .

## PHYSICAL DATA:

### CLIMATIC

#### FEDERAL AGENCIES

**Organization:** National Aeronautics and Space Administration (NASA)

**Contact:** n/a

**Email:** n/a

**Web address:** [http://www.agu.org/eos\\_elec/95206e.html](http://www.agu.org/eos_elec/95206e.html) or  
[http://eosweb.larc.nasa.gov/PRODOCS/srb/table\\_srb.html](http://eosweb.larc.nasa.gov/PRODOCS/srb/table_srb.html)

**Database name:** Surface Radiation Budget

**Description:** A global long-term dataset of monthly average surface radiation budget (SRB) parameters is now available at the NASA Langley Research Center (LaRC), Hampton, Virginia. This dataset is an extension of the LaRC component of the 46-month shortwave (SW) dataset developed by the SRB Satellite Data Analysis Center (SDAC) available from the Langley Distributed Active Archive Center (DAAC) as described by Pinker et al. [1995]. It is the product of computationally fast radiative transfer algorithms developed for deriving surface radiative fluxes on a global scale using satellite data. The primary source of input data was the International Satellite Cloud Climatology Project (ISCCP) C1 product. The dataset extends over the entire 96-month duration of the ISCCP C1 product (July 1983 to June 1991), and includes both SW and longwave (LW) surface fluxes. It should prove to be a valuable resource for a variety of climate studies as it can be used in the development of general circulation models of the atmosphere and oceans, and in the studies of surface processes and interannual climate anomalies such as El Niño/Southern Oscillation and regional floods and droughts.

**Organization:** National Oceanic and Atmospheric Administration (NOAA)

**Contact:** n/a

**Email:** n/a

**Web address:** [http://www.ncdc.noaa.gov/oa/climate/online\\_data/forts/forts.html](http://www.ncdc.noaa.gov/oa/climate/online_data/forts/forts.html)

**Database name:** 19th Century U.S. Climate Dataset Project

**Description:** In situ monthly temperature and precipitation data for the United States from the Nineteenth Century are being compiled and documented by this project. The period of record for the temperature data begins in 1822; The precipitation data begin in 1837. These data previously existed in published form in reports that are deteriorating with age.

These long-term data sets include the U.S. Historical Climatology Network (USHCN) and the Global Historical Climatology Network (GHCN) and contain monthly-scale data for several thousand stations covering the last 150 to

200 years. Most of these data, however, are concentrated in the Twentieth Century, with the Nineteenth Century under-represented.

#### *REGIONAL ORGANIZATIONS*

n/a

#### *STATE AGENCIES*

n/a

#### *OTHER ORGANIZATIONS*

**Organization:** University of Virginia (UVA)

**Contact:** Patrick Michaels

**Email:** [pjm8x@virginia.edu](mailto:pjm8x@virginia.edu)

**Web address:** [http://climate.virginia.edu/online\\_data.htm](http://climate.virginia.edu/online_data.htm)

**Database name:** **Climate Data Sources**

**Description:** provides links to online climate data: station data; hourly, daily, & monthly data; means & extremes; solar & wind; marine data

#### *LANDSCAPE*

##### *FEDERAL AGENCIES*

**Organization:** Environmental Protection Agency (EPA)

**Contact:** Alan Woods

**Email:** [woods.alan@epa.gov](mailto:woods.alan@epa.gov)

**Web address:** <http://www.epa.gov/wed/pages/ecoregions.htm>

**Database name:** **Ecoregions**

**Description:** Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. They are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. By recognizing the spatial differences in the capacities and potentials of ecosystems, ecoregions stratify the environment by its probable response to disturbance. These general purpose regions are critical for structuring and implementing ecosystem management strategies across federal agencies, state agencies, and nongovernment organizations that are responsible for different types of resources within the same geographical areas.

**Organization:** United States Geological Survey (USGS)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.lsc.usgs.gov/gis/nlpd/asp/pages/about.htm>

**Database name:** **National Landscape Pattern Database**

**Description:** This data was created as part of a national analysis of land cover pattern. A series of derived maps (different indices, different window sizes) is available. They are proposed for consideration by landscape analysts, as

independent variables (e.g., covariates, stratification rules), and as "context" information for finer-scale investigations, for example field plots. Data available for Forest Area Density, Forest Fragmentation (both 30m resolution & 9x9 pixel analysis windows) & Landscape Pattern Types (30m resolution & 81x81 analysis window). MRCL data used.

**Organization:** US Geological Survey – Multi-Resolution Land Characteristics Consortium (MRLC)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.mrlc.gov/index.php>

**Database name:** National Land Cover Database (NLCD)

**Description:** The Multi-Resolution Land Characteristics (MRLC) Consortium is a group of federal agencies who first joined together in 1993 (MRLC 1992) to purchase Landsat 5 imagery for the conterminous U.S. and to develop a land cover dataset called the National Land Cover Dataset (NLCD 1992). In 1999, a second-generation MRLC consortium (see logos) was formed to purchase three dates of Landsat 7 imagery for the entire United States (MRLC 2001) and to coordinate the production of a comprehensive land cover database for the nation called the National Land Cover Database (NLCD 2001).

NLCD2006 update is currently being worked on : To continue monitoring the current land cover condition and updating land cover inventory, a prototype that uses spectrally normalized Landsat images and NLCD 2001 data layers is being developed. The method has been tested in five study areas-New England, Mississippi, South Dakota, Washington, and Southern California-to update NLCD to a nominal date of 2006.

New developments in mapping methodology, new sources of input data, and changes in the mapping legend for the 2001 National Land Cover Database (NLCD 2001) will confound any direct comparison between NLCD 2001 and the 1992 National Land Cover Dataset (NLCD 1992). Users are cautioned that direct comparison of these two independently created land cover products is not recommended. This NLCD 1992/2001 Retrofit Land Cover Change Product was developed to offer users more accurate direct change analysis between the two products. The NLCD 1992/2001 Retrofit Land Cover Change Product uses a specially developed methodology to provide land cover change information at the Anderson Level I classification scale (Anderson et al., 1976), relying on decision tree classification of Landsat imagery from 1992 and 2001. Unchanged pixels between the two dates are coded with the NLCD 2001 Anderson Level I class code, while changed pixels are labeled with a "from-to" land cover change value (Change Code Table). Additional detail is available in the metadata included in the multizone downloadable zip file. This product is designed for regional application only and is not recommended for local scales.

## **REGIONAL ORGANIZATIONS**

n/a

## STATE AGENCIES

**Organization:** Virginia Department of Conservation and Recreation (VA-DCR)

**Contact:** David Boyd

**Email:** david.boyd@dcr.virginia.gov

**Web address:** [http://www.dcr.virginia.gov/land\\_conservation/tools02a.shtml](http://www.dcr.virginia.gov/land_conservation/tools02a.shtml)

**Database name:** Virginia Conservation Lands Database

**Description:** The Virginia Department of Conservation and Recreation has developed the Commonwealth's first comprehensive, continually maintained GIS data layer for Virginia's protected conservation lands. This database includes mapped boundaries and attributes for public and certain private lands having various conservation, recreation and open-space roles. DCR's Natural Heritage Program staff was charged by the Virginia Land Conservation Foundation and the Department of Technology Planning to develop the database.

Most federal, state, regional and interstate lands are included. This includes water and park authorities, parks and undeveloped or partially-developed lands owned by localities, as well as lands owned as preserves by nonprofit conservation organizations such as The Nature Conservancy. Also included are conservation easements held by the Virginia Outdoors Foundation, land trusts and others.

State resource agencies, universities, land trusts, and regional and local government will find this database invaluable for environmental, recreation and conservation planning. This database will also serve agencies with economic development interests, including such groups as the Virginia Economic Development Partnership, planning district commissions and localities. These boundaries are not intended for legal uses; no warranty, expressed or implied, is made by the Virginia Department of Conservation and Recreation (DCR) as to the accuracy of this data. Distribution of the data shall not constitute any such warranty, and no responsibility is assumed by DCR in the use of these data.

**Organization:** Virginia Department of Conservation and Recreation (VA-DCR)

**Contact:** Joe Weber

**Email:** joseph.weber@dcr.virginia.gov

**Web address:** [http://www.dcr.virginia.gov/natural\\_heritage/vclnavnla.shtml](http://www.dcr.virginia.gov/natural_heritage/vclnavnla.shtml)

**Database name:** Virginia Natural Landscape Assessment

**Description:** The Virginia Natural Heritage Program (VNHP) in the Department of Conservation and Recreation has developed a network of natural lands for the commonwealth of Virginia. This project, named the Virginia Natural Landscape Assessment (VaNLA), is a landscape-scale geospatial analysis for identifying, prioritizing, and linking natural lands in Virginia. Using land cover data derived from satellite imagery, the VaNLA identifies large patches of natural land with at least one hundred acres of interior cover. This interior cover, known as core area, begins one hundred meters from patch edges. Small patches with ten to ninety-nine acres of interior cover are included as habitat fragments that support landscape corridors and that may be important in localities with few large patches of natural land. For simplicity in the remainder of this document, core areas and

habitat fragments will be referred to collectively as ecological cores. Although the VaNLA is predominantly an analysis of forests, ecological cores include marshes, dunes, and beaches where these covers are abundant and exceed minimum size requirements.

The products of the VaNLA include GIS data, hardcopy and digital maps, and a report that summarizes the methodology and results and discusses potential uses of the GIS data.

**Organization:** Virginia Department of Forestry (VaDOF)

**Contact:** John Miller or Mindia Brown

**Email:** John.Miller@dof.virginia.gov or mindia.brown@dof.virginia.gov

**Web address:** <http://www.dof.virginia.gov/gis/datadownload.shtml>

**Database name:** Statewide Wildfire Risk Assessment

**Description:** The Virginia Department of Forestry (VDOF) used GIS to develop a statewide spatial Wildfire Risk Assessment model that aims to: (1) identify areas where conditions are more conducive and favorable to wildfire occurrence and wildfire advancement; (2) identify areas that require closer scrutiny at larger scales; and (3) examine the spatial relationships between areas of relatively high risk and other geographic features of concern such as woodland home communities, fire stations and fire hydrants. This model incorporates data from several other state and federal agencies including land cover, demographics, transportation corridors and topography. Differences in the relative importance of model variables necessitated the use of three individual analyses broken along Virginia's mountain, piedmont and coastal plain physiographical regions. The three model results were merged to produce the statewide Wildfire Risk Assessment.

**Organization:** Virginia Department of Forestry (VaDOF)

**Contact:** Nathan Stinnette

**Email:** Nathan.Stinnette@dof.virginia.gov

**Web address:** <http://www.dof.virginia.gov/gis/datadownload.shtml>

**Database name:** Virginia Historical Wildfire Incidents, 2002-2006

**Description:** This data set is derived from the Virginia Department of Forestry's internal fire incident reports for the time period from 2002-2006 inclusive. Wildland fires in Virginia occurring outside of the VDOF's jurisdiction are not included. In addition, the dataset is limited to those points for which accurate locational data was reported, therefore it should not be regarded as a complete report of all VDOF reported fires for the period in question.

**Organization:** Virginia Department of Forestry (VaDOF)

**Contact:** Mindia Brown

**Email:** mindia.brown@dof.virginia.gov

**Web address:** <http://www.dof.virginia.gov/gis/datadownload.shtml>

**Database name:** Virginia Wildfire Incidents, 1995-2001

**Description:** This dataset contains the locations of wildfire incidents throughout Virginia as documented by the Virginia Dept. of Forestry. Wildfires that occurred

between the years 1995-2001 inclusive are contained in this database. Generally speaking, fires occurring on federal lands are not included.

**Organization:** Virginia Department of Game and Inland Fisheries (VaDGIF)

**Contact:** Lenee Pennington

**Email:** Lenee.Pennington@dgif.virginia.gov

**Web address:** <http://www.dgif.virginia.gov/gis/gis-data.asp>

**Database name:** Virginia's Birding and Wildlife Trail

**Description:** This dataset contains designated wildlife watching sites on the Virginia Birding & Wildlife Trail put together by the Virginia Department of Game and Inland Fisheries' (VDGIF). These data are formatted as an ArcView shapefiles compiled by the VDGIF Fish and Wildlife Information Services (FWIS). These data are presented as points representing each site.

This dataset is primarily for cartographic representation. It does not include property boundaries of each site.

**Organization:** Virginia Department of Game and Inland Fisheries (VaDGIF)

**Contact:** Dave Morton

**Email:** dmorton@dgif.state.va.us

**Web address:** <http://www.dgif.virginia.gov/gis/gis-data.asp>

**Database name:** Cold Water Streams Survey (CWSS) – trout streams

**Description:** These data represent the Virginia Department of Game and Inland Fisheries (VDGIF) coldwater, or trout, streams. The Fisheries Division of VDGIF has identified all of the reaches in this dataset as wild (Class I-IV) or stockable (Class V and VI) trout streams or as tributaries to wild trout streams. These classifications give the streams special management considerations and protection. Please note that many of the streams are on private property and are not necessarily public fishing waters. Date: 2005

**Organization:** Virginia Department of Game and Inland Fisheries (VaDGIF)

**Contact:** Dave Morton

**Email:** dmorton@dgif.state.va.us

**Web address:** <http://www.dgif.virginia.gov/gis/gis-data.asp>

**Database name:** Virginia's Ecoregions

**Description:** These data represent the ecoregions used in Virginia's Wildlife Action Plan. The units are a modified Bailey Ecoregions at the section level. The data were edited from sections provided by Key's et al 1995 Ecoregion Subsection data. The national scale Section level map was used to guide the grouping of subsections, specifically the delineation between northern and southern cumberland mountains.

This dataset shows Virginia divided into ecoregions. These data can be used to determine ecoregion members of any geographic feature in Virginia.

**Organization:** Virginia Department of Game and Inland Fisheries (VaDGIF)

**Contact:** Dave Morton

**Email:** dmorton@dgif.state.va.us

**Web address:** <http://www.dgif.virginia.gov/gis/gis-data.asp>

**Database name:** VDGIF Wildlife Management Area (WMA) Boundaries

**Description:** This dataset contains boundary information for Virginia Department of Game and Inland Fisheries' (VDGIF) Wildlife Management Areas (WMA). The coverage includes all WMAs within Virginia. These data are formatted as an ArcView shapefiles compiled by the VDGIF Fish and Wildlife Information Services (FWIS) from the VDGIF Capital Outlay database. These data are presented as polygons of each site boundary. Date: 2003

## OTHER ORGANIZATIONS

**Organization:** William and Mary - Center for Conservation Biology

**Contact:** Bryan Watts

**Email:** bdwatt@wm.edu

**Web address:** [http://ccb.wm.edu/habitat/resources/resource\\_home.htm](http://ccb.wm.edu/habitat/resources/resource_home.htm)

**Database name:** Habitat Assessment

**Description:** This web section is designed to provide the user with direct access to digital products produced as part of the regional habitat assessment. All of these products have been designed to allow for customized, user-driven searches.

## WATER RELATED

### FEDERAL AGENCIES

**Organization:** Federal Emergency Management Agency (FEMA)

**Contact:** n/a

**Email:** n/a

**Web address:** <https://hazards.fema.gov/femaportal/wps/portal/NFHLWMS>  
or <http://www.fema.gov/library/viewRecord.do?id=3291>

**Database name:** National Flood Hazard Layer (NFHL)

**Description:** FEMA provides access to the National Flood Hazard Layer through Web Map Services. The National Flood Hazard Layer is a computer database that contains FEMA's flood hazard map data. The data depict flood hazard information and supporting data used to develop the information. The primary hazard classifications are the 1 percent-annual-chance flood event, the 0.2 percent-annual-chance flood event, and areas of minimal flood hazard. (Looks like the data has to be ordered.)

**Organization:** National Oceanic and Atmospheric Administration (NOAA)

**Contact:** Melanie Hamilton

**Email:** Melanie.Hamilton@noaa.gov

**Web address:** <http://www.nodc.noaa.gov/GTSPP/index.html>

**Database name:** Global Temperature-Salinity Profile Program

**Description:** The U.S. National Oceanographic Data Center (NODC) maintains the global database of temperature and salinity data as a result of NODC participation in the Global Temperature – Salinity Profile Program (GTSPP). The GTSPP data are maintained in a relational database, the so called Continuously

Managed Database (CMD), which is managed by commercial software on a UNIX workstation. Real-time data are added, as they arrive from Canada's Marine Environmental Data Service (MEDS) three times per week. Higher quality delayed mode data are now being quality controlled and added to the CMD. As these observations are added, the matching real-time data are tagged to avoid accepting two copies of the same data. The database makes it possible to quickly load and retrieve data, as well as statistics about the number of observations per geographic region, time period, ship, or data type. Other NODC roles include preparing monthly data sets and transferring them to participants in the U.S., Australia and France, as well as to other requesters and maintaining GTSP files on line.

**Organization:** United States Geological Survey (USGS)

**Contact:** Ken Hyyer

**Email:** kenhyer@usgs.gov

**Web address:** <http://va.water.usgs.gov/chesbay/RIMP/index.html>

**Database name:** Chesapeake Bay River Input Monitoring Program

**Description:** In the mid-1980's, the USGS Chesapeake Bay River Input Monitoring (RIM) Program was established to quantify loads and long-term trends in concentrations of nutrients and suspended material entering the tidal part of the Chesapeake Bay Basin from its nine major tributaries. These nine rivers account for approximately 93% of the stream flow entering Chesapeake Bay from the non-tidal part of its watershed. Results of the RIM program are being used by resource managers, policy makers, and concerned citizens to help evaluate the effectiveness of strategies aimed at reducing nutrients and sediment entering Chesapeake Bay from its tributaries. Data available: concentrations, loads, and stream flow.

**Organization:** United States Geological Survey (USGS)

**Contact:** n/a

**Email:** webmaster@md.water.usgs.gov

**Web address:** <http://md.water.usgs.gov/monthly/bay.html> or

<http://va.water.usgs.gov/chesbay/RIMP/dataretrieval.html>

**Database name:** Estimated Streamflow entering Chesapeake Bay

**Description:** The health of the Chesapeake Bay is largely driven by changes in stream flow and the amount of pollution it contains. Runoff in the Chesapeake Bay watershed carries pollutants, such as nutrients and sediments, to rivers and streams that drain to the Bay. Scientists use the estimated stream flow entering the Chesapeake Bay to assess the health of the Bay and make ecological forecasts.

Estimated stream flow entering the Chesapeake Bay is calculated monthly based on index stations on the Susquehanna River, Potomac River, and James River. The data is presented based on the current water year (WY), the natural, annual water cycle from October through September that is used by hydrologists. Records have been kept since 1937.

**Organization:** United States Geological Survey (USGS)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://infotrek.er.usgs.gov/traverse/f?p=136:1:0::NO::>

**Database name:** USGS National Water Quality Assessment Data Warehouse

**Description:** The U.S. Geological Survey (USGS) began its NAWQA (National Water Quality Assessment) program in 1991, systematically collecting chemical, biological, and physical water quality data from 42 study units (basins) across the nation. The data warehouse currently contains and links the following data up through 9/30/2007:

- Chemical concentrations in water, bed sediment, and aquatic organism tissues for about 3,100 chemical constituents
- Site, basin, well and network characteristics with many descriptive variables
- Daily stream flow information for fixed sampling sites
- Ground water levels for sampled wells
- 7,600 surface water sites (including 2,700 reach segments for biological studies) and 8,800 wells
- 51,000 nutrient samples and 32,000 pesticide samples as well as 10,000 VOC samples
- 2,600 samples of bed sediment and aquatic organism tissues
- Biological community data for 22,500 fish, algae and invertebrate samples

Most of these data came from the USGS National Water Information System--NWIS Water-Quality Data for NAWQA sites.

**Organization:** United States Geological Survey (USGS)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://waterdata.usgs.gov/va/nwis/nwis>

**Database name:** USGS Water Data for Virginia

**Description:** The U.S. Geological Survey's (USGS) National Water Information System (NWIS) is a comprehensive and distributed application that supports the acquisition, processing, and long-term storage of water data. NWISWeb serves as the publicly available portal to a geographically seamless set of much of the water data maintained within NWIS

## REGIONAL ORGANIZATIONS

**Organization:** Alliance for the Chesapeake Bay

**Contact:** n/a

**Email:** mail@acb-online.org

**Web address:** <http://www.acb-online.org/project.cfm?vid=87>

**Database name:** Citizen Monitoring (water quality)

**Description:** The Alliance Citizen Monitoring program is a regional network of more than 145 trained volunteers who perform weekly water quality tests that

help track the condition of waters flowing toward the Chesapeake Bay. Data collected include dissolved oxygen, pH, and water clarity.

**Organization:** Chesapeake Bay National Estuarine Research Reserve in Virginia (CBNERRVA)

**Contact:** n/a

**Email:** cbnerr@vims.edu

**Web address:** <http://www.vims.edu/cbnerr/index.htm>

**Database name:** Water quality data

**Description:** National Estuarine Research Reserve (NERR) has designed and implemented a System-wide Monitoring Program whose goal is to identify and track short-term variability and long-term changes in the integrity and biodiversity of representative estuarine ecosystems and coastal watersheds for the purpose of contributing to effective national, regional, and site specific coastal zone management. Currently this monitoring program includes water quality and meteorologic monitoring components.

Physical-chemical water quality is currently monitored semi-continuously (15 minute intervals) at the Virginia Reserve sites. Measured parameters include water temperature, salinity, dissolved oxygen, pH, turbidity, and water depth. This semi-continuous water quality monitoring program was initiated in 1995. Beginning in 2002, the Reserve began monitoring inorganic nutrients (ammonium, nitrate, nitrite, ortho-phosphate), total dissolved nitrogen and phosphorus, and chlorophyll at the Reserve sites. Meteorological conditions are also continuously monitored at Sweet Hall Marsh and Taskinas Creek (York River State Park). Stations record air temperature, relative humidity, rainfall, barometric pressure, wind speed and directions and photosynthetic active radiation (PAR). This program began in 1998.

**Organization:** Chesapeake Bay Program (CBP)

**Contact:** Tami Huber - Tele: 800-YOUR-BAY ext. 785

**Email:** n/a

**Web address:**

<http://www.chesapeakebay.net/dataandtools.aspx?menuitem=14872>

**Database name:** CBI Water Quality Database (1949-1982)

**Description:** Measured and calculated physical and nutrient parameters for the Chesapeake Bay and Tidal Tributaries. Can download but asks specific questions about what you want.

**Organization:** Chesapeake Bay Program (CBP)

**Contact:** Tami Huber - Tele: 800-YOUR-BAY ext. 785

**Email:** n/a

**Web address:**

<http://www.chesapeakebay.net/dataandtools.aspx?menuitem=14872>

**Database name:** CBI Water Quality Database (1982-present)

**Description:** Measured and calculated physical and nutrient parameters for the Chesapeake Bay and Tidal Tributaries. Can download but asks specific questions about what you want.

**Organization:** Chesapeake Bay Program (CBP)

**Contact:** Greg Allen - Tele: 800-YOUR-BAY ext. 746

**Email:** n/a

**Web address:** [http://www.chesapeakebay.net/data\\_toxics.aspx](http://www.chesapeakebay.net/data_toxics.aspx)

**Database name:** CBP Toxics Database

**Description:** Chemical contaminant and threshold data for the Chesapeake Bay. 1973-present.

**Organization:** Chesapeake Bay Program (CBP)

**Contact:** Ning Zhou - Tele: 800-YOUR-BAY ext. 727

**Email:** n/a

**Web address:** [http://www.chesapeakebay.net/data\\_toxics.aspx](http://www.chesapeakebay.net/data_toxics.aspx)

**Database name:** Bay Program Nutrient Point Source Database

**Description:** This database includes both monitored and estimated data submitted from or approved by each jurisdiction. The primary purposes of this database are to track the point source nutrient load reduction and to provide input decks to the Chesapeake Bay watershed model and water quality model. This database does NOT serve any compliance related purposes.. 1984-2006.

## STATE AGENCIES

**Organization:** Virginia Department of Conservation and Recreation (VA-DCR)

**Contact:** n/a

**Email:** latia.durant@dcr.virginia.gov

**Web address:** [http://www.dcr.virginia.gov/soil\\_&\\_water/npsassmt.shtml](http://www.dcr.virginia.gov/soil_&_water/npsassmt.shtml)

**Database name:** Nonpoint Source (NPS) Assessment

**Description:** Every two years since the 1980s, DCR has evaluated the potential for water quality degradation caused by nonpoint sources (NPS) of pollution on a per hydrologic unit basis along with some indicators of where such degradation might have its greatest negative impact. Results are published in the NPS Chapter of the Virginia Water Quality Assessment (305b) Report (PDF), published by the Virginia Department of Environmental Quality (DEQ). Assessment results are reported to the U.S. Environmental Protection Agency, Congress and the Virginia General Assembly

**Organization:** Virginia Department of Environmental Quality (VADEQ)

**Contact:** Roger Stewart

**Email:** restewart@deq.virginia.gov

**Web address:**

[http://gisweb.deq.virginia.gov/monapp/mon\\_data\\_retrieval\\_app.html#](http://gisweb.deq.virginia.gov/monapp/mon_data_retrieval_app.html#)

**Database name:** Water Quality Monitoring Data

**Description:** DEQ staff in each of the regional offices collects water samples on a routine schedule at more than 1,000 locations across the Commonwealth. These water samples are shipped to a state laboratory for chemical and bacterial tests. The samples are tested for levels of nutrients, solids, bacteria associated with human and animal wastes, toxic metals, some pesticides and harmful organic compounds.

DEQ's scientists also perform on-the-spot field tests for dissolved oxygen, pH, temperature, salinity, and additional indications of water quality. Samples from the mud at the bottom of lakes and rivers also are tested for the presence of pesticides and other harmful compounds.

The tens of thousands of samples and chemical test results generated each year are kept in a computer database. Virginia has more than 5 million water quality observations in its database, third largest among the states.

## *OTHER ORGANIZATIONS*

**Organization:** Old Dominion University

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.ccpo.odu.edu/chesbaymouth/>

**Database name:** Monthly Chesapeake Bay Mouth Climatology

**Description:** Hydrographic properties across the mouth of Chesapeake Bay has been monitored by the Center for Coastal Physical Oceanography (CCPO) with support from the Department of Earth, Ocean and Atmospheric Sciences at Old Dominion University since April 1992.

Cruises have been scheduled almost every month on the spring tidal cycle for the past sixteen years, 152 cruises have been completed up to September 2007. During each cruise, hydrographic profiles are obtained at twenty individual stations in a line approximately parallel to the Chesapeake Bay Bridge-Tunnel. The first station starts at the southern part of the bay mouth near Norfolk and the section continues northward toward Cape Charles. Each station is placed roughly one nautical mile (1.8 km) apart from the other. At each station, a Sea-Bird Electronics (SBE) 25 SEALOGGER CTD (conductivity, temperature, and depth) or a SBE 19 SEACAT Profiler CTD is slowly lowered at several seconds per meter down through the water column until the instrument is within one meter of the bay floor. As the CTD is lowered it records the depth in meters, temperature (°c), and conductivity (Siemens/m). Finally, the raw CTD data were corrected and salinity (psu) determined using the SBE Data Processing software. The data were averaged over 1 meter intervals.

**Organization:** University of New Hampshire

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.rivdis.sr.unh.edu/>

**Database name:** Global River Discharge Database (RivDIS v1.1)

**Description:** The Global River Discharge Database development efforts represent the first step in a continually evolving compilation of river discharge information. One of the primary sources of information for the database development was the UNESCO river archives and the series of publications entitled "The Discharge of Selected Rivers of the World" which were provided, in book form from 1969 through 1984. The series served as an important source of information on approximately 1000 stations. RivDis v1.0 provides discharge data from the original UNESCO publication series in a digital format that can be easily acquired and analyzed by researchers and planners in the water sciences community. The contents of RivDis v1.0 was published recently in book form (Vorosmarty et al. 1996a) and can be obtained from UNESCO's International Hydrological Programme Headquarters (Offices: 1, Rue Miollis /75732 Paris CEDEX 15). This has resulted in the development of a database we refer to as RivDIS v1.0 and full publication summarizing the database. Data available for James River : <http://www.rivdis.sr.unh.edu/cgi-bin/TileMap>

## OTHER

### *FEDERAL AGENCIES*

n/a

### *REGIONAL ORGANIZATIONS*

n/a

### *STATE AGENCIES*

n/a

### *OTHER ORGANIZATIONS*

**Organization:** Virginia Institute of Marine Science (VIMS)

**Contact:** n/a

**Email:** n/a

**Web address:**

<http://www.vims.edu/physical/research/VIMSWAVE/VIMSWAVE.htm>

**Database name:** Directional Wave Data

**Description:** From the fall of 1988 until the spring of 1995, the Virginia Institute of Marine Science, in cooperation with the Virginia Department of Conservation and Recreation, operated a wave station 2.5 nautical miles northeast of the Thimble Shoal Light (TSL) in Lower Chesapeake Bay to collect long-term directional wave observations. After the initial season, a second wave station was briefly placed in operation north of the Wolf Trap Light (WLT) and a third wave station was operated simultaneously with the TSL station during the winter and spring of 1993 at the eastern end of the Thimble Shoal Entrance (TSE) channel near the Chesapeake Bay mouth. Although the program was terminated in 1995 for lack of funding, these stations provide the only systematic wave observations known to exist in Chesapeake Bay. The observations are made available here in html format (Microsoft Excel).

**Organization:** Virginia Institute of Marine Science (VIMS)  
**Contact:** n/a  
**Email:** n/a  
**Web address:** <http://www.vims.edu/bayinfo/weather/index.php>  
**Database name:** VIMS Meteorological and Hydrographic Data  
**Description:** temperature, conductivity and salinity (through 2005); wind direction, rainfall, solar radiation (through 2006)

**Organization:** Virginia Institute of Marine Science (VIMS)  
**Contact:** n/a  
**Email:** n/a  
**Web address:** <http://www.vims.edu/GreyLit/VIMS/sramsoc204> and <http://www.vims.edu/GreyLit/VIMS/maocsv3>  
**Database name:** Middle Atlantic outer continental shelf environmental studies  
**Description:** Special report in applied science and ocean engineering no. 204. Virginia Institute of Marine Science. 1979. 165p. Summary and synthesis of chemical, physical, geological, and biological OCS benchmark studies conducted in the Middle Atlantic Bight. Included are field and laboratory methods, significant findings, cross shelf patterns in the pelagic and benthic realms and patterns related to local ridge and swale topography.

## COMBINED BIOLOGICAL and PHYSICAL DATA:

### FEDERAL AGENCIES

**Organization:** Environmental Protection Agency (EPA)  
**Contact:** n/a  
**Email:** n/a  
**Web address:** <http://www.epa.gov/emap/html/data/index.html>  
**Database name:** Environmental Monitoring & Assessment Program  
**Description:** EMAP's Data Groups conduct environmental stress or indicator research and monitoring on the Nation's ecological resources. Below you can get background and contact information as well as available data and metadata files for each Data Group. (surface waters (mid-Atlantic Streams), estuaries, landscape ecology, wetlands, agroecosystems)

The EMAP National Coastal Database contains estuarine and coastal data that EMAP and Regional-EMAP have collected since 1990 from thousands of stations along the U.S. coasts. These data include water column data, sediment contaminants and toxicity data, and benthic macroinvertebrate and demersal fish community and contaminant data. Various dates 1984-2004

**Organization:** United States Department of Agriculture (USDA)  
**Contact:** n/a  
**Email:** n/a

**Web address:** <http://www.ers.usda.gov/Data/>

**Database name:** Economic Research Service datasets

**Description:** farming and agricultural data.

**Organization:** U.S. Forest Service

**Contact:** David Wear

**Email:** [dwear@fs.fed.us](mailto:dwear@fs.fed.us)

**Web address:** <http://www.srs.fs.fed.us/sustain/index.htm>

**Database name:** Southern Forest Resource Assessment

**Description:** The Southern Forest Resource Assessment documents and analyzes the many factors that are affecting the forests of 13 Southern States. The goal was to answer 23 specific questions about southern forests and their uses, and, in the process, to create a comprehensive base of information about them. Questions range from “What are the history, status, and projected future of terrestrial wildlife habitat types and species in the South?” to “How have abiotic factors including environmental stressors such as air pollution influenced the overall health of the South's forests and what are future effects likely to be?” Each question was addressed by subject experts who comprised the Assessment Team, and their work is presented as individual chapters in the Assessment’s Technical Report. Data used in the Assessment have been assembled and made available through a public Web site.

**Organization:** United States Geological Survey (USGS)

**Contact:** Scott D. Klopfer

**Email:** n/a

**Web address:** <http://gapanalysis.nbii.gov/portal/server.pt>

**Database name:** GAP Analysis

**Description:** Gap Analysis consists of three main data layers: a landcover layer, a layer showing the predicted distributions of vertebrate species, and a stewardship layer. Data is available for download. The Virginia Gap Analysis Project (VA-GAP) was initiated as a cooperative effort between the Biological Resource Division of the U.S. Geological Survey, and state, federal, and private natural resources groups in Virginia. The major objectives of the project were to (1) produce GIS-databases describing the actual land cover type, predicted distributions of terrestrial vertebrates, land ownership, and land management status at a scale of 1:100,000, (2) identify land cover types and terrestrial vertebrate species that currently are not represented or are underrepresented in areas managed for long-term maintenance of biodiversity (i.e., “gaps”), and (3) facilitate cooperative development and use of information so that institutions, agencies, and private land owners may be more effective stewards of Virginia’s natural resources.

## REGIONAL ORGANIZATIONS

n/a

## STATE AGENCIES

**Organization:** Virginia Department of Conservation and Recreation (VA-DCR)

**Contact:** n/a

**Email:** pco@dcr.virginia.gov

**Web address:** [http://www.dcr.virginia.gov/natural\\_heritage/dbsearchtool.shtml](http://www.dcr.virginia.gov/natural_heritage/dbsearchtool.shtml)  
or [http://www.dcr.virginia.gov/natural\\_heritage/nhrinfo.shtml](http://www.dcr.virginia.gov/natural_heritage/nhrinfo.shtml)

**Database name:** **Natural heritage resources:** natural communities, rare, threatened, & endangered animals and plants

**Description:** Nearly 10,000 occurrences of over 1600 natural heritage resource elements are documented in Virginia. A searchable database on the Internet allows users to produce lists of resources that occur in specific counties, watersheds or physiographic regions. You can search for information on individual or groups of resources, by scientific or common name, taxonomic group, federal or state legal status, global or state rarity rank.

All searches return HTML formatted lists including the scientific/common names, taxonomic group, global and state heritage rarity ranks, federal legal status under the U.S. Endangered Species Act, and Virginia state legal status. These reports are not site specific and are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

**Organization:** Virginia Department of Environmental Quality (VADEQ)

**Contact:** Darryl Glover

**Email:** dmgllover@deq.virginia.gov

**Web address:** <http://www.deq.virginia.gov/fishtissue/>

**Database name:** **Fish Tissue and Sediment Monitoring**

**Description:** The Department of Environmental Quality - Office of Water Quality Programs' Fish Tissue and Sediment Contaminants Monitoring Program conducts routine studies of fish tissue and sediment samples in state waters. At least one sediment sample is collected at each station where fish tissue are sampled and analyzed for a suit of bioaccumulative chemical contaminants. These include selected heavy metals, selected non-halogenated organic compounds (PAHs) and halogenated organic compounds (DDT, Chlordane, PCBs, etc.).

**Organization:** Virginia Department of Game and Inland Fisheries (VaDGIF)

**Contact:** Kendell Ryan

**Email:** kendell.ryan@dgif.virginia.gov

**Web address:** <http://www.dgif.virginia.gov/gis/gis-data.asp>

**Database name:** **Tier 1 Essential Habitat; Tier I and II Essential Habitat**

**Description:** The Tier1\_Ess\_Hab raster shows locations of confirmed and/or potential habitat of Tier 1 species created during the Virginia Wildlife Action Plan (WAP). It represents habitat for fifty-three terrestrial species and thirty-three aquatic species. Of the ninety-three Tier I species, habitat was mapped for eighty-six species. These habitats were summarized to show areas of conservation opportunity.

This dataset is intended to highlight conservation opportunities in Virginia. All areas with the potential to support a Tier I species are important, however areas that may support multiple species represent areas of greater conservation need.

## OTHER ORGANIZATIONS

**Organization:** University of Virginia (UVA): The Shenandoah Watershed Study (SWAS)

**Contact:** Rick Webb

**Email:** rwebb@virginia.edu

**Web address:** <http://swas.evsc.virginia.edu/>

**Database name:** Shenandoah Watershed Study & Virginia Trout Stream Sensitivity Study

**Description:** The Shenandoah Watershed Study (SWAS) program involves measurement of precipitation and stream-water properties to determine the concentration and flux of chemical material along hydrologic pathways in the forested mountain watersheds of Shenandoah National Park and the mid-Appalachian region. The monitoring and research priorities of the SWAS program have been concerned with factors that most directly affect the composition of stream waters. Among these are atmospheric deposition, insect infestation, and forest regeneration. Through the effort to detect, understand, and predict stream-water change associated with these and other causative factors, the SWAS program has created a framework of hydro-biogeochemical information that supports a broad range of ecosystem monitoring and research.

The SWAS program was begun in 1979 as a cooperative undertaking of Shenandoah National Park and the Department of Environmental Sciences at the University of Virginia. SWAS data collection within Shenandoah National Park is coordinated with the Virginia Trout Stream Sensitivity Study (VTSSS), which extends watershed research and monitoring to native brook trout streams throughout the mountains of western Virginia. Regional-scale analysis has allowed identification of biologically important trends that are obscured on less extensive scales by variation due to lithology, forest disturbance, and other local factors. The integrated SWAS-VTSSS data collection framework represents (1) spatial variation through a site selection strategy based on differences in landscape properties, and (2) temporal variation by collecting data at different frequencies.

**Organization:** University of Virginia (UVA) - Virginia Coastal Reserve Long-Term Ecological Research (VCR/LTER)

**Contact:** John Porter

**Email:** jhp7e@virginia.edu

**Web address:**

<http://www.vcrlter.virginia.edu/data/query/text/datasets/BPH8801B.html> or  
<http://www.vcrlter.virginia.edu/home/index.php?module=ContentExpress&file=index&func=display&ceid=7&meid=8>

**Database name:** Long Term Ecological Research

**Description:** hurricane records (1667-1976); long term precipitation for the Virginia coast reserve (1837-1987); Physical data (weather data, tides data); Biological data (biodiversity database, bird, fish, vegetation, aquatic invertebrates, small mammal).

The Virginia Coast Reserve Long-term Ecological Research Project focuses on understanding the relationships between physical, biological and anthropogenic forces on the dynamic ecology of a coastal barrier island, lagoon and mainland system.

Primary study sites are located on Hog Island, Parramore Island, and mainland marshes near Nassawadox VA. The VCR/LTER maintains a laboratory facility in Oyster, VA

**Organization:** Virginia Commonwealth University (VCU)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://instar.vcu.edu/>

**Database name:** Interactive Stream Assessment Resource (INSTAR)

**Description:** INSTAR (INteractive STREAM Assessment Resource) is a dynamic and interactive internet application built on ESRI's ArcIMS platform and supported by dedicated servers at Virginia Commonwealth University's Center for Environmental Studies. INSTAR allows users to access and manipulate a comprehensive (and growing) database representing over 2,000 stream and river collections statewide. Accessible data represent fish and macroinvertebrate assemblages, instream habitat, and stream geomorphology. The application supports user-driven database queries, mapping functions, and quantitative biological assessments of stream reaches and watersheds, using algorithms and ecological models that compare user-selected sites to appropriate regional reference conditions. INSTAR is accessible from most computers via the internet and navigation throughout the application is relatively easy. For more information, download a presentation in ADOBE PDF. Program began in 2003.

## MISCELLANEOUS DATA:

### *FEDERAL AGENCIES*

**Organization:** Federal Geographic Data Committee (FGDC)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://clearinghouse1.fgdc.gov/servlet/FGDCWizard>

**Database name:** National Geospatial Data Clearinghouse

**Description:** The Geospatial Data Clearinghouse is a collection of over 250 spatial data servers that have digital geographic data primarily for use in Geographic Information Systems (GIS), image processing systems, and other modeling software. These data collections can be searched through a single interface based on their descriptions, or "metadata."

**Organization:** United States Forest Service (USFS)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://fsgeodata.fs.fed.us/clearinghouse/index.html>

**Database name:** **FSGeodata Clearinghouse**

**Description:** The FSGeodata Clearinghouse provides on-line access to selected geospatial information and metadata held by the Forest Service for National Forest System lands.

**Organization:** National Aeronautics and Space Administration (NASA )

**Contact:** Lola Olsen

**Email:** n/a

**Web address:** <http://gcmd.gsfc.nasa.gov/index.html>

**Database name:** **Global Change Master Directory**

**Description:** Our goal is to enable users to locate and obtain access to Earth science data sets and services relevant to global change and Earth science research. The GCMD database holds more than 25,000 descriptions of Earth science data sets and services covering all aspects of Earth and environmental sciences. One can use the search box or select from the available keywords to search for data and services. We encourage your participation in writing and maintaining the information in our databases. You will find authoring tools to assist you. In addition, Subscription services are available to notify you of new entries. The Committee on Earth Observation Satellites (CEOS) International Directory Network (IDN) Interoperability Forum is available to discuss content and database issues.

**Organization:** National Oceanic and Atmospheric Administration (NOAA)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://coastalpredictioncenter.chesapeakebay.net/>

**Database name:** **Chesapeake Bay Coastal Prediction Center**

**Description:** The Coastal Prediction Center provides access to a wide range of graphical and data products related to the Chesapeake Bay. Initially the site focuses on physical environmental conditions, including weather, winds, waves, currents, and tides.

**Organization:** National Oceanic and Atmospheric Administration (NOAA)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://coastalgeospatial.noaa.gov/welcome.html>

**Database name:** **NOAA's Coastal Geospatial Data Program**

**Description:** NOAA's National Coastal Assessment and Data Synthesis (CA&DS) provides a systematic framework that integrates data such as eutrophication conditions, pollutant sources and loadings, population, sediment contamination, and others that are consistently formatted using a hierarchical set of spatial units defined by the Coastal Assessment Framework (CAF).

**Organization:** National Oceanic and Atmospheric Administration (NOAA)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.ngdc.noaa.gov/ngdcinfo/onlineaccess.html>

**Database name:** National Geophysical Data Center (NGDC)

**Description:** web site shows available data to download

**Organization:** National Park Service (NPS)

**Contact:** n/a

**Email:** n/a

**Web address:** [http://www.nps.gov/gis/data\\_info/](http://www.nps.gov/gis/data_info/)

**Database name:** National Park Service Data Clearinghouse

**Description:** an assortment of data for national parks (Va: George Washington Memorial Parkway, Manassas National Battlefield Park, Prince William Forest Park)

**Organization:** U.S. Census Bureau

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.census.gov/>

**Database name:** U.S. Census Bureau data

**Description:** Population, economics, TIGER, etc

**Organization:** US Climate Change Science Program

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.usgcrp.gov/usgcrp/default.php>

**Database name:** US Global Change Research Program

**Description:** Agency Data Sets Related to Global Change (available in 2001):

<http://www.usgcrp.gov/usgcrp/Library/datasets2001/default.htm>

**Organization:** U.S. Fish and Wildlife Service

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.fws.gov/data/gisfgov.html#NRCS>

**Database name:** Federal Government Sources: GIS data sites

**Description:** A listing of various GIS data (spatial) sites, via US Fish and Wildlife Service

**Organization:** U.S. Fish and Wildlife Service

**Contact:** Lila Borge Wills, Division Coordinator

**Email:** lborge@vt.edu

**Web address:** <http://fwie.fw.vt.edu/WWW/nframes/info.htm>

**Database name:** Fish and Wildlife Information Exchange

**Description:** The Fish and Wildlife Information Exchange (FWIE) is a Division within the Conservation Management Institute which is housed within the College of Natural Resources at Virginia Tech. It is a technical assistance center, data analysis center, and information clearinghouse for fish, wildlife, and land management agencies and organizations. The FWIE also assists with the planning, development, implementation, and maintenance of information management and delivery systems. We maintain and distribute information and offer training in computer applications, database management, and use. The FWIE has helped dozens of agencies and organizations to better manage their information resources to more effectively conserve wildlife, plants, and natural communities in North America.

## REGIONAL ORGANIZATIONS

**Organization:** Chesapeake Bay Observing System (CBOS)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.cbos.org/>

**Database name:** Chesapeake Bay Observing System

**Description:** The Chesapeake Bay Observing System (CBOS) is a sub-regional association and observing system being developed for "Serving the Ocean Observing Data and Information needs of the Chesapeake Bay and Coastal Bay and Ocean communities".

**Organization:** Chesapeake Bay Program (CBP)

**Contact:** n/a

**Email:** n/a

**Web address:**

<http://archive.chesapeakebay.net/data/historicaldb/historicalmain.htm>

**Database name:** Variety Chesapeake Bay Historical Data Sets

**Description:** The historical database files include all available files for data collected in the Chesapeake Bay watershed before the birth of the Chesapeake Bay Program in 1984. Before the start of the Bay Program, the EPA awarded grants to state government agencies and academic institutions to begin research on the health of the Chesapeake Bay Watershed in a variety of categories including point and nonpoint source pollution, toxics, human population growth, land use, and living resources. These data sets are the results of those grant projects. The date range for each project varies and data can often be incomplete. After the formation of the Chesapeake Bay Program in 1983 new monitoring initiatives were begun. Those data can be found in the CBP Data Hub.

All datasets are currently Access flat files which were originally SAS datasets. The files were sorted by subject into the following categories: BMP, Coliform, Culture, Discharge, Flow, Nutrients, Physical, Point Source, Living Resources, Sediment, and Toxics. Most data sets include a summary file containing metadata, a contents file which lists the titles of the fields, and a means file which contains the calculated averages of each column. Some data sets also

have a stations file that lists the geographic locations of each sampling station for that particular study. All informational files appear on the More info page in viewable text format.

## STATE AGENCIES

**Organization:** Virginia Department of Game and Inland Fisheries (VaDGIF)

**Contact:** Dave Morton

**Email:** dmorton@dgif.state.va.us

**Web address:** <http://www.dgif.virginia.gov/gis/gis-data.asp>

**Database name:** VDGIF Fish Hatcheries

**Description:** This dataset contains point locations for Virginia Department of Game and Inland Fisheries' (VDGIF) fish cultural stations. The coverage includes all VDGIF owned hatcheries within Virginia. These data are formatted as ArcView shapefiles and were compiled by the VDGIF Fish and Wildlife Information Services (FWIS) from the VDGIF Capital Outlay database. These data are presented as points. Date: 2001

**Organization:** Virginia Department of Game and Inland Fisheries (VaDGIF)

**Contact:** Shirl Dressler (804) 367-6913

**Email:** shirl.dressler@dgif.virginia.gov

**Web address:** <http://vafwis.org/fwis/>

**Database name:** Fish and Wildlife Information Service

**Description:** VaFWIS is based on fish and wildlife literature for all native and naturalized species found in Virginia. Reviews performed by Department of Game and Inland Fisheries biologists are summarized and indexed in an agency database called Biota of Virginia (BOVA). You will find species characteristics, habitat groupings, locations of occurrence, and management practices described within BOVA. Registered subscribers have access to additional analysis used for scientific research, land management, permit review, and other regulatory review of projects. There is no charge to government agencies, non-profit organizations or public school systems.

**Organization:** Virginia Department of Game and Inland Fisheries (VaDGIF)

**Contact:** Dave Morton

**Email:** dmorton@dgif.state.va.us

**Web address:** <http://www.dgif.virginia.gov/gis/gis-data.asp>

**Database name:** VDGIF Maintained Boat Access Locations

**Description:** This dataset contains locational information for Virginia Department of Game and Inland Fisheries' (VDGIF) owned public boating access sites. The coverage includes all of Virginia. These data are formatted as an ArcView shapefile and compiled by the VDGIF Fish and Wildlife Information Services (FWIS) from the VDGIF Capital Outlay database. These data are presented as point locations. Date: 2005

## OTHER ORGANIZATIONS

**Organization:** George Mason University  
**Contact:** Charles Grymes  
**Email:** cgrymes@gmu.edu  
**Web address:** <http://www.virginiaplaces.org/boundaries/gisdata.html>  
**Database name:** GIS Data Layers - Virginia  
**Description:** A list (with links) of a variety of locations with datasets (ESRI, Bureau of Census, FEMA, EPA, etc)

**Organization:** National Atlas  
**Contact:** n/a  
**Email:** n/a  
**Web address:** <http://www.nationalatlas.gov/atlasftp.html#bbsrtsl>  
**Database name:** National Atlas  
**Description:** Nearly all data available in the National Atlas Map Maker can be downloaded at no cost. This raw data and its most up-to-date documentation is accessible from the index. Raw data downloads: Agriculture (agriculture census); Biology (bat ranges, amphibian distributions, butterfly occurrence, invasive species, etc); Boundaries (public lands, wilderness preservation system areas, etc); Climate (average annual precip 1961-1990, hurricanes, seasonal sea surface temp average, etc); Environment (superfund national priorities list sites, water discharge permits, etc); Geology (earthquakes 1568-2004, geologic map, magnetic field, mining, surficial deposits & minerals, etc); People (west Nile virus surveillance, census bureau, etc); Water (aquifers, dams, surface water sampling sites, stream flow stations, water use).

**Organization:** National Biological Information Infrastructure (NBII)  
**Contact:** n/a  
**Email:** n/a  
**Web address:** [http://www.nbio.gov/portal/community/Communities/Geographic\\_Perspectives/Mid-Atlantic/](http://www.nbio.gov/portal/community/Communities/Geographic_Perspectives/Mid-Atlantic/)  
**Database name:** National Biological Information Infrastructure Mid-Atlantic Information Node  
**Description:** The Mid-Atlantic Information Node (MAIN) is a regional node of the National Biological Information Infrastructure (NBII) encompassing Delaware, Maryland, Pennsylvania, Virginia, West Virginia, and the District of Columbia. Our primary mission is to facilitate access to and use of the biological resource information that is available for the region.

**Organization:** NatureServe  
**Contact:** n/a  
**Email:** n/a  
**Web address:** <http://www.natureserve.org/aboutUs/index.jsp>  
**Database name:** Conservation and ecological data available

**Description:** NatureServe is a non-profit conservation organization whose mission is to provide the scientific basis for effective conservation action. NatureServe and its network of natural heritage programs are the leading source for information about rare and endangered species and threatened ecosystems. NatureServe represents an international network of biological inventories-known as natural heritage programs or conservation data centers-operating in all 50 U.S. states, Canada, Latin America and the Caribbean. Together we not only collect and manage detailed local information on plants, animals, and ecosystems, but develop information products, data management tools, and conservation services to help meet local, national, and global conservation needs. The objective scientific information about species and ecosystems developed by NatureServe is used by all sectors of society-conservation groups, government agencies, corporations, academia, and the public-to make informed decisions about managing our natural resources.

**Organization:** University of Virginia (UVA) - Center for Regional Environmental Studies (CRES)

**Contact:** Hank Shugart, Director

**Email:** hhs@virginia.edu

**Web address:** <http://www.uvacres.org/>

**Database name:** unknown

**Description:** Regional Environmental Studies differ from much of traditional science by their explicit consideration of people. CRES focuses on investigating global change issues on a regional scale from social and environmental perspectives in order to better inform international policy and development. Our science questions are focused on regional environmental systems at scales where the cultural, political and economic forces of human activity are inextricably linked to the environment.

Research includes: Biocomplexity Project – Eastern Shore and Vegetation Community Functioning on the Barrier Islands – Delmarva Peninsula

**Organization:** University of Virginia (UVA) – Mountain Lake Biological Station

**Contact:** n/a

**Email:** mlbs@virginia.edu

**Web address:** <http://mlbs.org/>

**Database name:** unknown

**Description:** The Mountain Lake Biological Station is a field research and teaching facility located in the deciduous hardwood forest of the Appalachian Mountains of southwestern Virginia. It is the field station of the Biology Department at the University of Virginia. Long-term data sets are primarily meteorological.

**Organization:** University of Virginia (UVA): Virginia Forest Research Facility

**Contact:** Jose Fuentes

**Email:** jf6s@virginia.edu

**Web address:** <http://people.virginia.edu/~jf6s/pace/pace.html>

**Database name:** unknown

**Description:** The Virginia Forest Research Facility serves the purposes to conduct field research in the general area of atmosphere-surface interactions and to support teaching activities in the subjects of atmospheric sciences, ecology and hydrology. Several short-term studies are being carried out at the Virginia Forest Research Facility. One of them is to investigate the actinic irradiance disposition inside the forest canopy.

**Organization:** Virginia Institute of Marine Science (VIMS) – Center for Coastal Resources Management (CCRM)

**Contact:** Marcia Berman

**Email:** [marcia@vims.edu](mailto:marcia@vims.edu)

**Web address:**

[http://ccrm.vims.edu/gis\\_data\\_maps/interactive\\_maps/blueinfrastructure/bi\\_intro.html](http://ccrm.vims.edu/gis_data_maps/interactive_maps/blueinfrastructure/bi_intro.html)

**Database name:** Blue Infrastructure data

**Description:** The Blue Infrastructure online mapping tool integrates important aquatic resources that have been compiled for the coastal zone of Virginia using GIS technology.

These data represent archives from a variety of agencies and programs. Within the Virginia Institute of Marine Science, data from the Comprehensive Coastal Inventory Program (CCI), and Submerged Aquatic Vegetation (SAV) survey program are included. Data contributions from the Department of Conservation and Recreation, the Department of Game and Inland Fisheries, Virginia Marine Resources Commission, and Virginia Commonwealth University were essential. Metadata records provided by the data developer can be accessed by clicking on data layers in the data layer menu. If metadata records are not available for a particular data theme, a brief description of the data has been prepared. The final project report can be downloaded.

**Organization:** Virginia Institute of Marine Science (VIMS) – Center for Coastal Resources Management (CCRM)

**Contact:** n/a

**Email:** n/a

**Web address:** <http://www.vims.edu/ccrm/wetlands/newpermits.html>

**Database name:** Wetland Permits Application Database

**Description:** Database contains permit application information from 1971 to present for tidal waters of Virginia.

**Organization:** Virginia Tech GIS

**Contact:** Ed Brooks

**Email:** [ebrooks@vt.edu](mailto:ebrooks@vt.edu)

**Web address:** <http://www.ogis.org.vt.edu/>

**Database name:** unknown databases at Office of Geographic Information Systems (OGIS)

**Description:** OGIS is an affiliation of teaching and research faculty from 5 colleges, 15 departments and the Virginia Tech Libraries who share an interest and expertise in Geospatial Information Technologies (GIT)

**Organization:** World Resource Institute

**Contact:** n/a

**Email:** n/a

**Web address:** <http://earthtrends.wri.org/index.php>

**Database name:** EarthTrends

**Description:** EarthTrends is a comprehensive online database, maintained by the World Resources Institute, which focuses on the environmental, social, and economic trends that shape our world.

# INDEX:

## A

Amphibian Monitoring Project.....	20
Amphibian survey	
Virginia Frog and Toad Calling Survey.....	21
Animal data for download.....	21
Avian Inventory, Field data for George	
Washington Birthplace National Monument .	7
Avian Surveys at Fort Belvoir, Virginia, Multi-	
season .....	9

## B

Benthic Database, Baywide.....	5
Benthic Foraminifera and Ostracoda from	
Virginia Continental Shelf.....	4
Benthic Habitats and Biological Resources off	
the Virginia Coast.....	6
Benthic Surveillance, Monitoring data .....	4
Bioeffects Assessment Data .....	4
Bird Areas, Important.....	8
Bird Banding Station, Kiptopeke.....	13
Bird Count, Audubon’s Christmas .....	11
Bird Inventory of the Blue Ridge Parkway 2003-	
2004.....	6
Bird Monitoring Program at Langley AFB,	
Virginia, Airfield .....	10
Bird survey	
Avian surveys at Blandly Experimental Farm	
.....	27
Bobwhite Quail Count in Virginia.....	11
Monitoring Avian Productivity and	
Survivorship (MAPS) Program at Marine	
Corps Base Quantico, Virginia .....	11
Partners in Flight Species Assessment	
Database.....	12
Southeastern U.S. Nightjar Survey .....	13
The Appalachian Cooperative Grouse	
Research Project.....	12
Virginia Falcons .....	13
Wading Bird surveys at Fort Lee, Virginia..	10
Waterfowl Survey at Fort Belvoir, Virginia	10
Blue Infrastructure data .....	52
Boat Access Locations, Maintained .....	49
Bottom Trawl Survey Program.....	26
Breeding Bird Atlas, Virginia.....	9
Breeding Bird Survey (BBS), North American..	8
Breeding/nesting bird area – Greatfalls Park	
(GWMP).....	6
Butterfly survey	
Blandly Experimental Farm.....	27
Lepidoptera and Odonata Survey Data from	
George Washington Birthplace National	

Monument and Colonial National	
Historical Park.....	17

## C

Center for Regional Environmental Studies	
(CRES).....	51
Chesapeake Bay Coastal Prediction Center.....	46
Chesapeake Bay Observing System .....	48
Chesapeake Bay River Input Monitoring	
Program.....	35
Climate Change Bird Atlas.....	7
Climate Change Tree Atlas.....	24
Climate Data Sources .....	29
Climate Dataset Project, 19 <sup>th</sup> Century U.S. ....	28
Climatology, Monthly Chesapeake Bay Mouth	39
Coastal Geospatial Data Program, NOAA’s....	46
Conservation and ecological data .....	50
Conservation Lands Database, Virginia .....	31

## D

Directional Wave Data .....	40
-----------------------------	----

## E

EarthTrends .....	53
Economic Research Service datasets.....	42
Ecoregions .....	29
Ecoregions, Virginia’s .....	33
Environmental Monitoring & Assessment	
Program.....	41
Essential Habitat (Tier I and Tier II) .....	43

## F

Fall Cankerworm (2002) .....	18
Federal Agencies	
Environmental Protection Agency (EPA) ..	29,
41	
Federal Emergency Management Agency	
(FEMA).....	34
Federal Geographic Data Committee (FGDC)	
.....	45
National Aeronautics and Space	
Administration (NASA) .....	28, 46
National Oceanic and Atmospheric	
Administration (NOAA) ..4, 13, 14, 19, 26,	
28, 34, 46, 47	
National Park Service (NPS) ..6, 7, 14, 17, 18,	
19, 20, 22, 47	
U.S. Census Bureau .....	47
U.S. Climate Change Science Program .....	47
U.S. Department of Agriculture (USDA) ...	41
U.S. Department of the Interior Minerals	
Management Service.....	4

U.S. Fish and Wildlife Service (USFWS) ..23, 47	Monument, and Thomas Stone National Historic Site ..... 20
U.S. Forest Service (USFS).....7, 24, 42, 46	NCRN All Herps Sites ..... 20
U.S. Geological Survey (USGS).8, 24, 29, 30, 35, 36, 42	Historical Data Sets, Chesapeake Bay ..... 48
Federal Government Sources: GIS data sites ...47	
Fish	<b>L</b>
Northern Snakeheads in the Tidal Potomac.15	Land Cover Database, National ..... 30
Fish and Wildlife Information Exchange .....47	Landscape Assessment, Virginia Natural ..... 31
Fish and Wildlife Information Service .....49	Landscape Pattern Database, National..... 29
Fish Hatcheries .....49	Long Term Ecological Research ..... 45
Fish Inventories .....14	
Fish Tissue and Sediment Monitoring .....43	<b>M</b>
Fish Use Areas, Anadromous .....15	Mammal survey
Fisheries, Recreational and commercial fisheries .....14	Prince William Forest Park Deer sites ..... 20
Fishery survey	Survey of island small mammals – trapping data ..... 21
Menhaden Aerial Survey .....17	Mammal survey on SMR Camp Pendelton .... 22
Other VIMS surveys .....16	Marine Mammal Assessment Survey of the Southeast US Continental Shelf: February – April 2002 ..... 19
Trawl Survey Database.....17	Meteorological and Hydrographic Data, VIMS41
Fishes and fish larvae collected from Atlantic plankton cruises of R/V Pathfinder, December 1959-December 1960.....16	Middle Atlantic outer continental shelf environmental studies ..... 41
Fishes and fish larvae collected from Atlantic plankton cruises of R/V Pathfinder, March 1961-March 1962 .....16	Mountain Lake Biological Station ..... 51
Flood Hazard Layer, National .....34	Mussel Watch, Monitoring Data..... 14
Floristic Survey, Prince William Forest Park 2003-2004 .....22	
Fluorescence Database, Baywide .....5	<b>N</b>
Forest Cover 2005, Virginia .....25	National Atlas ..... 50
Forest Harvest.....25	National Biological Information Infrastructure (NBII) ..... 50
Forest Health .....27	National Biological Information Infrastructure Mid-Atlantic Information Node ..... 50
Forest Inventory and Analysis (FIA).....25	National Geophysical Data Center (NGDC).... 47
Forest Resource Assessment, Southern .....42	National Geospatial Data Clearinghouse ..... 45
Freshwater Biological Monitoring Data .....5	National Park Service Data Clearinghouse..... 47
FSGeodata Clearinghouse .....46	National Wetlands Inventory (NWI) ..... 23
	Natural heritage resources ..... 43
<b>G</b>	Nonpoint Source (NPS) Assessment ..... 38
GAP Analysis .....42	Nutrient Point Source Database, Bay Program 38
GIS Data Layers - Virginia.....50	
Global Change Master Directory .....46	<b>O</b>
Global Change Research, U.S. ....47	Office of Geographic Information Systems (OGIS) ..... 52
Gypsy Moth Defoliation (2002) and (2003).....18	Other Organizations
Gypsy Moth defoliation 1991, Prince William Forest Park.....18	Chesapeake Bay National Estuarine Research Reserve in Virginia (CBNERRVA) ..... 37
Gypsy Moth trapping database .....19	College of William and Mary .....13, 34
	George Mason University .....22, 50
<b>H</b>	Military (Fort Belvoir) .....9, 10
Habitat Assessment .....34	Military (Fort Lee Garrison) ..... 10
Hard Mast Survey, Northeast Regional .....23	Military (Langley Air Force Base ..... 10
Herpetological survey	Military (Marine Corps Base Quantico) .... 10
Inventory of Amphibians and Reptiles of Colonial National Historic Park, George Washington Birthplace National	Military (Naval Weapons Station Yorktown) ..... 11
	National Agricultural Pest Information System (NAPIS)..... 27

National Atlas .....	50	Virginia Department of Game and Inland Fisheries (VaDGIF).8, 9, 15, 21, 33, 43, 49	
National Audubon Society.....	11	Virginia Marine Resources Commission (VMRC) .....	15
National Biological Information Infrastructure (NBII) .....	12	Stream Assessment Resource (INSTAR), Interactive .....	45
NatureServe .....	21, 50	Streamflow entering Chesapeake Bay, Estimated .....	35
Old Dominion University .....	39	Streams Survey, Cold Water.....	33
Partners in Flight .....	12	Submerged Aquatic Vegetation (SAV) .....	26
University of New Hampshire .....	39	Surface Radiation Budget.....	28
University of Virginia (UVA)....	27, 29, 44, 51	<b>T</b>	
Virginia Coast Reserve Long-Term Ecological Research Project.....	21	Temperature-Salinity Profile Program, Global	34
Virginia Commonwealth University (VCU)	45	Toxics Database, CBP .....	38
Virginia Institute of Marine Science (VIMS) .....	6, 16, 17, 26, 40, 41, 52	Trails, Virginia's Birding and Wildlife.....	33
Virginia Tech .....	17, 19, 22, 52	Tree Cover 2000, Virginia.....	25
World Resource Institute .....	53	Tree Species Range maps, Digital representations of.....	24
Oyster Monitoring .....	16	<b>U</b>	
Oyster monitoring, fisheries and blue crab monitoring .....	15	U.S. Census Bureau data .....	47
<b>P</b>		<b>V</b>	
Pest tracker, NAPIS.....	27	Virginia Forest Research Facility .....	51
Piping Plover Nest Locations on Assateague Island National Seashore, 1994-2005 .....	7	<b>W</b>	
Plankton Database, Baywide CBP.....	5	Water Data for Virginia, USGS .....	36
<b>R</b>		Water Quality Assessment Data Warehouse, USGS National .....	36
Regional Organizations		Water quality data.....	37
Alliance for the Chesapeake Bay.....	20, 36	Water Quality Database (1949-1982), CBI .....	37
Chesapeake Bay Observing System (CBOS) .....	48	Water Quality Database (1982-present), CBI..	37
Chesapeake Bay Program (CBP) .5, 37, 38, 48		Water Quality Monitoring Data.....	38
River Discharge Database, Global.....	39	Water Quality, Citizen Monitoring .....	36
<b>S</b>		Wetland Permits Application Database .....	52
Shenandoah Watershed Study & Virginia Trout Stream Sensitivity Study.....	44	Wildfire Incidents, 1995-2001, Virginia.....	32
State Agencies		Wildfire Incidents, 2002-2006, Virginia Historical.....	32
Department of Environmental Quality (VADEQ).....	5, 38, 43	Wildfire Risk Assessment, Virginia .....	32
Virginia Department of Conservation and Recreation (VA-DCR) .....	31, 38, 43	Wildlife Management Area (WMA) Boundaries .....	34
Virginia Department of Forestry (VaDOF) 18, 24, 25, 27, 32			