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VIMS Researchers Anticipate High Levels of Dermo in 2006

Ryan Carnegie
Virginia Institute of Marine Science

Gene Burreson
Virginia Institute of Marine Science

Erin Seiling
Virginia Institute of Marine Science

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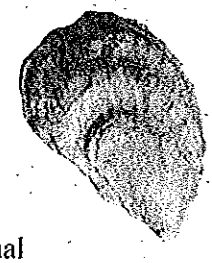


About Dermo

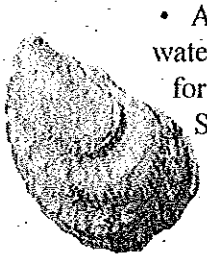
Elevated *Perkinsus marinus* levels in the Chesapeake Bay are expected in 2006, following a mild winter and very dry spring. *P. marinus*, the protistan parasite that causes Dermo disease, is currently the most serious oyster disease in Virginia waters, being responsible for significant annual mortality in both wild and aquacultured oyster stocks.

P. marinus exists naturally in oyster populations from the Gulf of Mexico to southern New England. Oyster populations tolerate low levels of *P. marinus* during cool seasons. However, *P. marinus* multiplies rapidly at temperatures above 20°C (68°F), triggering an outbreak of Dermo disease. As infected oysters die, large numbers of *P. marinus* cells are released into the water column and pass easily to neighboring oysters. This fuels a disease cycle that will not subside until temperatures fall during autumn. Peak mortality caused by *P. marinus* in Virginia normally occurs in September and October in oysters experiencing their second or third year of parasite exposure.

Two particular aspects of this year's weather trend point to an increase in *P. marinus* activity in 2006.

Mild Winter

First, winter was relatively mild. Extreme winters, with temperatures falling below 2-3°C (35-37°F), are thought to reduce overwintering levels of *P. marinus*. Temperatures in the Chesapeake Bay occasionally reach these lows, which decrease parasite population levels and thus the Dermo disease outbreak the following summer. Typically, water temperatures in the lower bay fall below 5°C (41°F) for a few weeks in January and February. In winter 2005/2006, water temperatures were relatively warm throughout the region.



- At Sewells Point in the James River, water temperatures dipped below 5°C (41°F) for parts of just three days in December. Spring levels of *P. marinus* were expected to be high as a result.
- In the James River, April prevalence of *P. marinus* was the highest observed since 2002.
- In the York River, June prevalence and intensity of *P. marinus* in annual April imports from the upper Rappahannock River were the highest ever recorded in this month by our laboratory.

Signs of an early and intense *P. marinus* outbreak, therefore, are already appearing.

Below Average Rainfall

Second, 2006 has been marked by below-average rainfall across the entire Chesapeake Bay watershed.

Reduced precipitation decreases freshwater river flows. The salinity of the bay and its tributaries therefore increases, as saltwater advances upstream. *P. marinus* is most active at salinities above 12 ppt. During droughts, oyster populations in normally low-salinity waters may experience increased salinities, and thus a *P. marinus* outbreak. Because natural oyster populations in such areas harbor little resistance to *P. marinus*, mortality can be very high, as at Deepwater Shoal in the James River in 2002.

In 2006, the watershed for lower Chesapeake Bay has received precipitation 26-50% below normal levels.

- Average March-June river flow for the Potomac has been the second lowest ever recorded.
- Average March-June river flows for the Susquehanna and James Rivers have been the lowest ever recorded.

If this trend continues, salinities will rise, and unusually intense *P. marinus* activity and oyster mortality can be expected in the late summer and fall in the upper James and Rappahannock Rivers, as well as in the Potomac.

While there is no way to mitigate the expected serious impact of *P. marinus* in natural Virginia oyster populations, heavy disease pressure in 2006 should have the positive long-term effect of deepening the

resistance to Dermo disease that is developing in natural populations. For aquaculturists, however, the potential for elevated *P. marinus* activity in 2006 should clearly be cause for concern. It would be prudent to harvest marketable oysters as soon as possible and before the end of summer, as these larger, older oysters are most likely to experience Dermo mortality.

How Can You Help?

Our understanding of Dermo disease impacts in Virginia waters will only be improved by any information Virginia aquaculturists can provide on mortality observed in cultured stocks in their local waters. All information will be confidential, and can be communicated by phone to Ryan Carnegie 804/684-7713 or Gene Burreson 804/684-7015.

Acknowledgements

Temperature data were obtained from the NOAA Center for Operational Oceanographic Products and Services *http://tidesandcurrents.noaa.gov*, precipitation data were obtained from the NOAA National Weather Service River Forecast Center *www.erh.noaa.gov/er/marfc/Maps/precip.html* and river flow data were obtained from the US Geological Survey *http://water.usgs.gov*.

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Shellfish Pathology Laboratory,
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Marine Advisory Services
School of Marine Science
Virginia Institute of Marine Science
College of William & Mary
P.O. Box 1346
Gloucester Point, VA 23062

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