CHESAPEAKE

EcoCheck

Assessing and forecasting ecosystem status

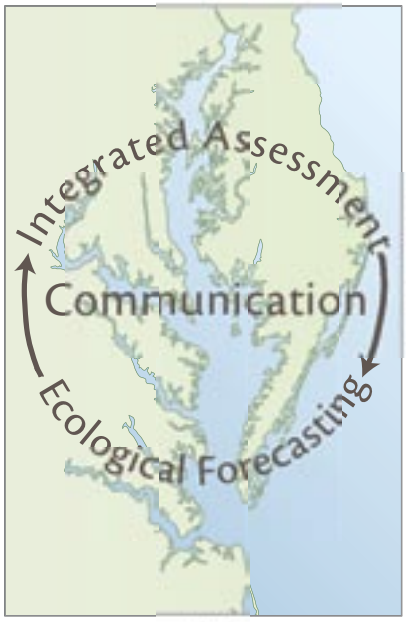
A NEW PARTNERSHIP

EcoCheck is a collaborative program that combines the human and capital assets of the National Oceanic and Atmospheric Administration and the Integration and Application Network at the University of Maryland Center for Environmental Science. The purpose of EcoCheck is to enhance and support the science, management and restoration of Chesapeake Bay through the integration of geographically detailed assessments and forecasts. EcoCheck works with academic, federal and state regulators and decision makers to develop tools and products to the Chesapeake Bay community.

PURPOSE AND APPROACH

Satellite image of Chesapeake Bay region.

It is becoming apparent that while current efforts have stemmed the degradation of Chesapeake Bay in the face of continued coastal development pressures, restoration projects will need additional efforts because they are not producing desired results at a pace that will meet the 2010 commitments set forth by the Chesapeake 2000 Agreement. Current efforts to monitor and assess the effects of restoration efforts are also deficient in many aspects. Monitoring and assessment is not locally oriented and, alone, cannot provide the information needed to assess the efficacy of local actions. Most of these activities suffer from a poor ability to synthesize large and complex data sets in a timely fashion. Furthermore, management is not guided by the best available information in the form of ecological forecasts. Through an annual cycle of a timely integrated ecosystem assessment and ecological forecasts, this project aims to more effectively communicate the health of Chesapeake Bay and the effectiveness of restoration efforts.



Annual ecological cycle that EcoCheck follows.

The EcoCheck approach builds on the positive feedback cycle between assessment and forecasting. Assessments provide the data and questions from which quantitative forecast models are developed. Continued assessment enables the forecast models to be tested and refined. Given the size and complexity of the issues affecting the Bay, EcoCheck projects aim to be as geographically detailed as possible. Communication tools will be used to maximize impact of the project findings in terms of improving Bay management. We hope to make a maximum impact for a small program by working collaboratively with other programs.

Studying how the flora and fauna of Chesapeake Bay react to human encroachment is one part of EcoCheck.




INTEGRATED ASSESSMENT ⟷ ECOLOGICAL FORECASTING →

GOALS

Spatial assessment

Develop methods for and conduct spatially explicit assessments of Chesapeake Bay ecosystem health.

Ecosystem health

Develop methods for and conduct an annual assessment of ecosystem health by combining a variety of parameters into an overall health report.

Forecast models

Determine the processes through which forcing variables such as weather operate and affect ecosystem health.

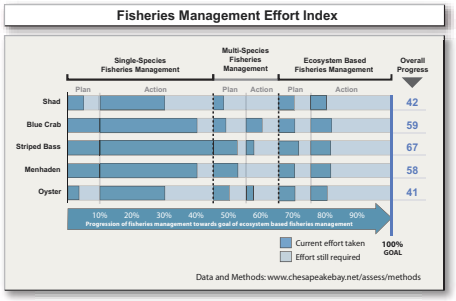
Summer ecological forecast

Establish and support a quantitative ecological forecasting program that aids management.

CURRENT PROJECTS

Annual integrated assessment

Support the Chesapeake Bay Program indicator frameworks and communication redesign effort.



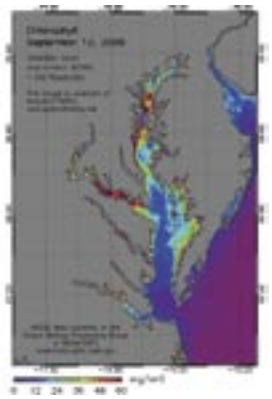
National Estuarine Eutrophication Assessment

Collaborate in the update and enhancement of the latest survey report.

Remote sensing and environmental indicators

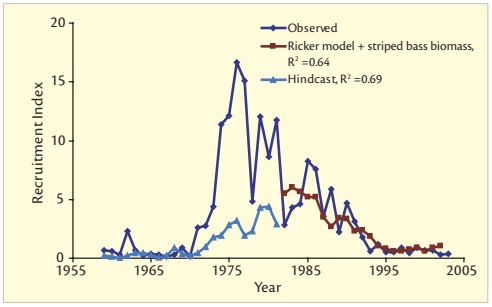
Promote the use of water quality remote sensing data in decision support tools.

Review and promote the application of suitable Chesapeake Bay environmental health indicators.



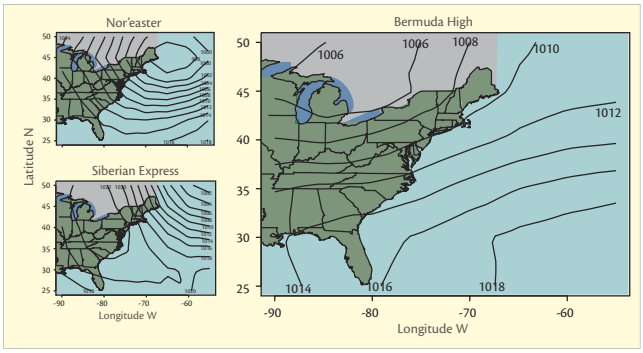
Fish recruitment model

Develop models that can predict the recruitment of key Chesapeake Bay fish species such as Atlantic menhaden.



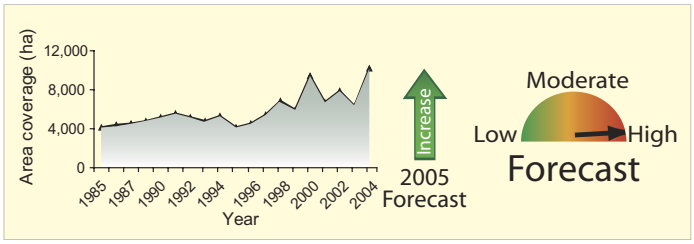
Climatology

Explore the effects of weather patterns on fish recruitment.



Summer ecological forecast

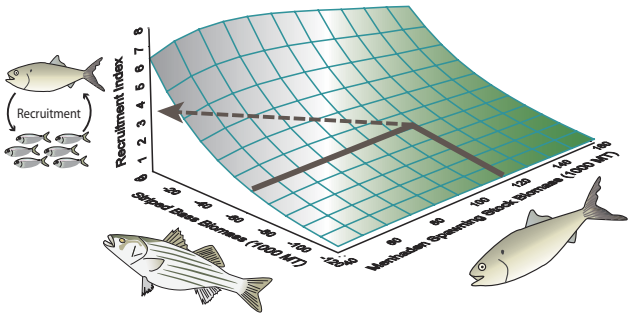
Support the Chesapeake Bay Program in the production and communication of a summer ecological forecast.



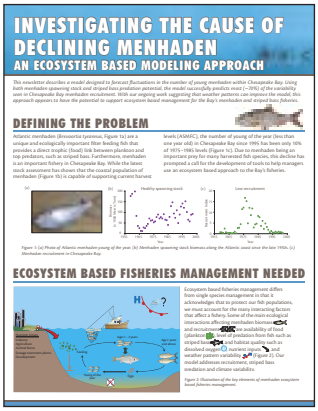
SCIENCE COMMUNICATION

EcoCheck will aid in improving Chesapeake Bay health through effective science communication to the Bay community.

Tools



Newsletters


INVESTIGATING THE CAUSE OF DECLINING MENHADEN
AN ECOSYSTEM BASED MODELING APPROACH

DEFINING THE PROBLEM

ECOSYSTEM BASED FISHERIES MANAGEMENT NEEDED

Workshops


Chesapeake Bay water quality decision support systems

Chesapeake Bay Remote Sensing Symposium
January 31st 2006

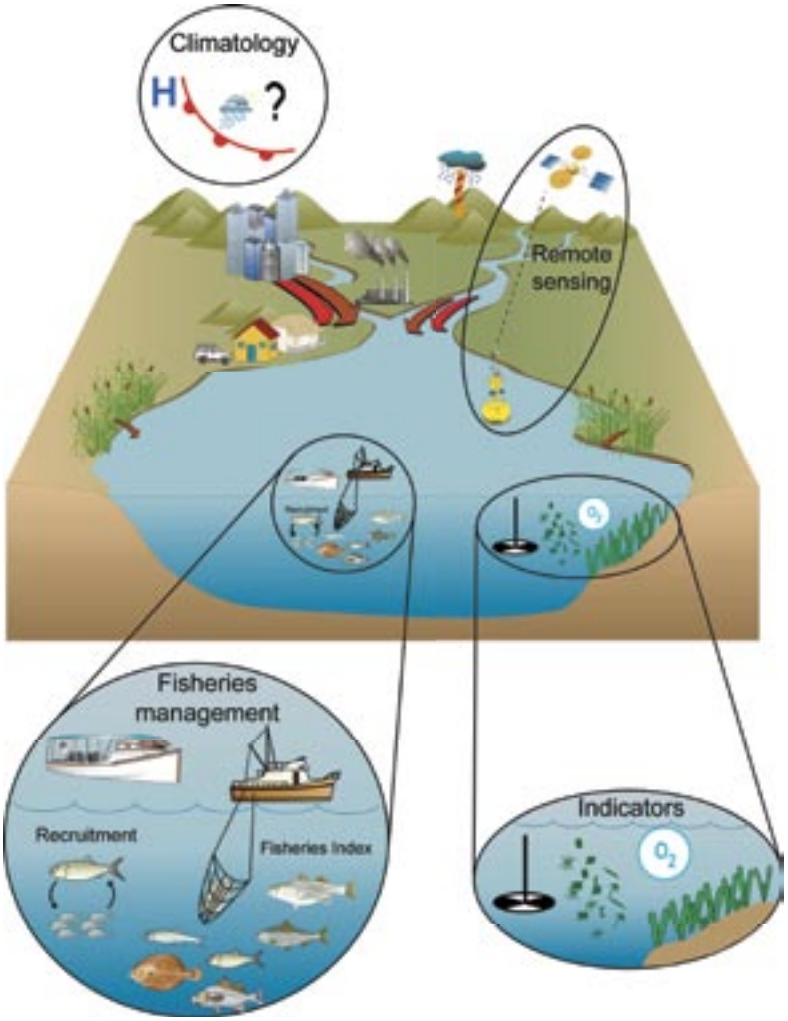
Ben Longstaff

EcoCheck

Interactive websites

BENEFICIAL OUTCOMES

Effective management is essential for improved health of Chesapeake Bay, and EcoCheck will help provide the support and knowledge needed for this effort.



- Increased understanding of how climatology affects fish recruitment in Chesapeake Bay.
- Incorporation of spatially explicit data into current management tools.
- Effective use of ecosystem health indicators.
- Prediction of fisheries variability with forecast models.

HISTORY OF ECOCHECK

The EcoCheck concept started in 2003 when Drs. Bill Dennison and Bob Wood discussed the idea of a partnership between the University of Maryland Center for Environmental Science (UMCES) and the National Oceanic and Atmospheric Administration (NOAA). They determined that the concept of EcoCheck should center around the belief that spatially explicit ecosystem health assessments and forecasts are needed to improve Chesapeake Bay health. Funding for the partnership was obtained from NOAA's Chesapeake Bay Office, leading to the hiring of two fellows in 2004 and an additional fellow in 2006. The Cooperative Oxford Laboratory in Oxford, Maryland, is the headquarters of EcoCheck.

Bill Dennison, PhD

Vice President of Science Applications at UMCES

Bill leads the Integration and Application Network at UMCES. The intent of IAN is to inspire, manage and produce timely syntheses and assessments on key environmental issues.

Bob Wood, PhD

Director of the Cooperative Oxford Laboratory

The Cooperative Oxford Laboratory is a NOAA-Maryland DNR research facility focused on defining the relationships between stressors, such as land use, climate variability, and pollution, on the state of Chesapeake Bay and other coastal ecosystems.

Ben Longstaff, PhD

Science Integrator

Ben has a background in seagrass ecology and ecosystem health monitoring and assessments. Before working for EcoCheck, Ben coordinated an ecosystem health monitoring program in Australia.

Xinsheng Zhang, PhD

Ecosystem Modeler

Xinsheng has a background in using multivariate statistics to spatially analyze environmental datasets. Before working for EcoCheck, Xinsheng worked at Horn Point Lab as an Associate Research Scientist.

Caroline Wicks, Ms

Science Applications Coordinator

Caroline has a background in plant responses to sediment characteristics. Before working for EcoCheck, Caroline was completing her Masters degree in Biological Oceanography at UMCES.

LOCATED AT THE COOPERATIVE OXFORD LABORATORY

Prepared April 2006
Design and layout: *Caroline Wicks*
Text: *Caroline Wicks and Ben Longstaff*
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Symbols for conceptual diagrams courtesy of the Integration and Application Network at the University of Maryland Center for Environmental Science.

Further information located at:
www.eco-check.org
www.ian.umces.edu
www.noaa.chesapeakebay.net

CHESAPEAKE EcoCheck
Assessing and forecasting ecosystem status

University of Maryland
Center for Environmental Science

The work described in this newsletter is being conducted as part of the EcoCheck program. EcoCheck is a fellowship program combining the human and captial assets of NOAA and the University of Maryland Center for Environmental Science.