

# Ecosystem-Based Fisheries Management

## What is ecosystem-based fisheries management (EBFM)?

EBFM is an integrated approach to management that considers an entire ecosystem, including humans. It seeks to maintain healthy ecosystem function that is productive and resilient. Instead of focusing on a single species or sector, it shifts attention to connections within the ecosystem, cumulative impacts that might be stressing that system, and balances multiple objectives that the system is supposed to serve. EBFM is inherently interdisciplinary and place-based.

## What are the first steps for the Chesapeake?

Figuring how to implement EBFM in the Chesapeake is an enormous task that involves a better understanding of trade-offs among watershed concerns, coordination of multiple policy jurisdictions, and meeting urban development alongside rural needs. It's challenging to tackle Bay-wide all at once. Therefore, we've chosen to take a first step focused on a particular topic in a particular place: oysters in the Rappahannock and Choptank Rivers.



## Why are we doing this?

Oysters serve many roles in the ecosystem, with each reef designated as sanctuary, restoration, aquaculture, or wild harvest. How can we think of them acting together as 'the oysters of the Bay' and how do we consider all these moving parts simultaneously? How do we recognize the different pieces of the complex while figuring out how they work together to produce our Bay's ecosystem? If we want healthy outcomes for all oysters and for Bay communities, what should we be paying attention to? The rivers of focus

incorporate all types of oysters within their boundaries and therefore provide a test case for ecosystem-based thinking.

## What is the outcome of this research project?

This project will inform decisions made by the Sustainable Fisheries Goal Implementation Team of the Chesapeake Bay Program. In the past and other regions of the US, EBFM has been criticized for not paying enough attention to the social and cultural dimensions of an ecosystem. This case study will provide a way for these broader efforts to consider the human implications of fishery management decisions.

## How are we doing this?

Ecosystem-based management looks very different in the variety of contexts in which it's been adopted, but there are a few shared themes. Our project will capture some of those elements. We surveyed stakeholders for what objectives they want to prioritize in EBFM and which indicators capture the full suite of social-ecological dynamics at work. A network and policy analysis will identify key communications pathways and legal openings for the introduction of EBFM. In the end, these along with a tool to help make the information useful, will be part of a roadmap package to help implement EBFM more broadly – in more places and addressing more species.

Contact information: Amy Freitag  
[aefreitag@vims.edu](mailto:aefreitag@vims.edu) | 804-684-7985



*Photo credit: header – NOAA NMFS, oyster - VASG*

## Oysters and Ecosystem-Based Management Survey: Results

From March-April 2015, 140 people took the Oyster and Ecosystem-Based Management Survey. That's 75% of those invited. This is a short summary of the results. Feel free to contact Amy with comments or questions.

### Priority Ecosystem Services and Indicators

The first goal of the survey was to prioritize the many possible ecosystem services that oyster reefs and bars contribute to the Bay and its communities, determining which ones should take priority in management decisions. Each ecosystem service could potentially be monitored through a related indicator; the most popular one for each service from the survey is listed below. Together, you can think of these indicators as a "checkup" on how healthy our oysters are.

Ecosystem Service Priorities	Best Indicator of the Priority
1. oyster health	Survival ratio/age composition Total population
2. oysters providing habitat	Abundance and diversity of resident organisms
3. improve water quality	Total nitrogen
4. improve system resilience	Biodiversity – number of species in a community
5. effective management and stewardship	Subsidies needed (shell, larvae, etc.)
6. support economy	Commercial fisheries harvest and market value
7. healthy relationship between parts of the watershed	Change in land use/land cover
8. maintain cultural heritage	Cultural representations of Bay resources

#### Who took the survey?

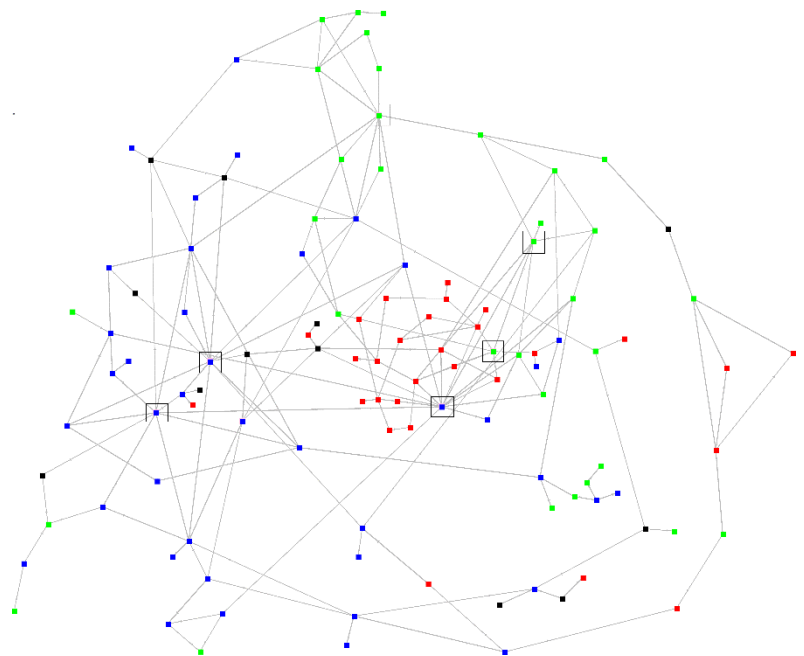
43 government staff  
39 academics  
32 fishing industry folks  
20 nonprofit staff  
6 didn't specify

*Note: Feasibility of using these indicators is to be determined. Data for the first 7 exist.*

### Analyzing the Network of Oyster Professionals

We mapped out who talks to whom about oysters. This is both to help us visualize where the conversations about each of the ecosystem services above might be happening as well as to figure out how feasible it is to ask current oyster experts to think about the full suite of oyster types in the Bay. Here are a few of the questions we were able to answer.

- How connected is the oyster community?** Communication across states and between experts on the various oyster types is plentiful, and there's a fair amount of communication across sectors, but there is room for improvement.
- Are there key communicators?** A handful of academics and managers serve as community experts, and many people look to them for advice. Sometimes this role is part of their job, other times it's a personality trait. Some of these folks serve as bridges between otherwise loosely connected parts of the network.
- Is your opinion of science or management the same as your closest contacts?** On a scale of 1-5, everyone agreed science is necessary (5) for success, but rated management as middle of the road (on average, 2.6). Strong opinions of management didn't seem to share between close contacts.



*Our network. Red dots represent people from industry, green dots are academics, blue dots are managers, and black dots are from nonprofits. Boxes are the community experts.*