



# An Online Environmental Dashboard for Albemarle-Pamlico Sound

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# The Issue: Communication of Information

*Ecosystem health information needs to be presented in a format that is:*

- Timely
- Actionable
- Easily accessible by a wide audience

# Solutions

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- Technical reports
- State of the [Bay, River, Sound, . . .] reports
- Environmental report cards
- Online environmental dashboards

# Solutions

## Report cards

### Pasquotank River Basin Ecosystem Report Card

#### Introduction

The Albemarle and Pamlico National Estuary Program is charged with the protection and restoration of the Albemarle and Pamlico (AP) Sound and the watershed that feeds into it. As part of our effort to inform stakeholders and the general public about the progress of this effort, we have developed a series of environmental health "Report Cards" for the major river basins that make up the AP complex. This document is the Report Card for the Pasquotank River Basin. It is meant to inform the reader about the overall ecological health of the river basin and identify and describe any factors that may be stressing the system.

**Figure 1** - Map of NCDNR water quality stations and NCDNR recreational water quality stations. NCDNR stations were located using the Water Quality Index (WQI). Recreational water quality stations were located based on the number of enterococci (bacteria) and coliforms over the most recent three years.

**Water Quality Monitoring Stations in the Pasquotank River**

WQI is based on 7 parameters: Temperature, Dissolved Oxygen, pH, Conductivity, Turbidity, Total Dissolved Solids, and Total Suspended Solids. WQI scores range from 0 (Poor) to 100 (Excellent).

**Recreational Water Quality Monitoring Stations in the Pasquotank River**

RWQI is based on 2 parameters: Enterococci and Coliforms. RWQI scores range from 0 (Poor) to 100 (Excellent).

### Ecosystem Stressors in the Pasquotank

#### of Potential Stressors in the Pasquotank River Ecosystem

**Point Source**  
Stressors that enter the water from a defined point can impact a significant amount of habitat and water quality. Management: Treatment plants and other point sources can be regulated and treated to improve water quality.

**Non-Point Source**  
Stressors that enter the water from diffuse sources can impact a significant amount of habitat and water quality. Management: Treatment plants and other point sources can be regulated and treated to improve water quality.

**Conceptual diagram illustrating the difference between an ecosystem with a Good WQI and a Poor WQI**

High NH4 concentrations are low leading to decreased Chl concentrations, increased DO and a high WQI. Increased water clarity allows more sunlight to reach the bottom, which provides more habitat for blue crabs and juvenile fish. Higher DO concentrations allow fish, crabs and oysters to exploit the cooler waters during summer months.

TP and NH4 concentrations are high leading to elevated Chl concentrations, decreased DO and a smaller WQI. Decreased water clarity impacts the growth of SAV decreasing habitat for blue crabs and juvenile fish. Lower DO concentrations eliminate deep water habitat and force fish and crabs into shallower waters.

### Ecosystem Report Card

#### Pasquotank Report Card

Parameter	Grade	Comments
NH4	Fair	NH4 not measured sufficiently at either station.
TP	Fair	TP was "Poor" at the upstream station and "Fair" at the downstream station.
Chl	Fair	Chl only monitored at the upstream station.
WCI	Poor	Water clarity was "Poor" at both stations.
DO	Good	DO was "Good" at both stations.
Enterococci	Good	There were no "Alerts" or "Advisories" for recreational water use.

**Overall Grade = C**

#### Things you can do to help

- Limit your use of fertilizers and pesticides on your home lawn and garden.
- Consider attaching one or more rainbarres to your home's downspouts.
- Clean up after your dog.
- Make sure that your septic system is in proper working order.
- Plant a tree.

**Knowledgegements:**  
Report card was written and produced by Dave Jordan, Executive Director, Environmental Concerns, Inc. and Erik Hansen, Director of the Albemarle-Pamlico Estuary Program, North Carolina Division of Water Quality. Some of the scores in the diagrams were obtained from the Integration and Application Platform.

Pros:

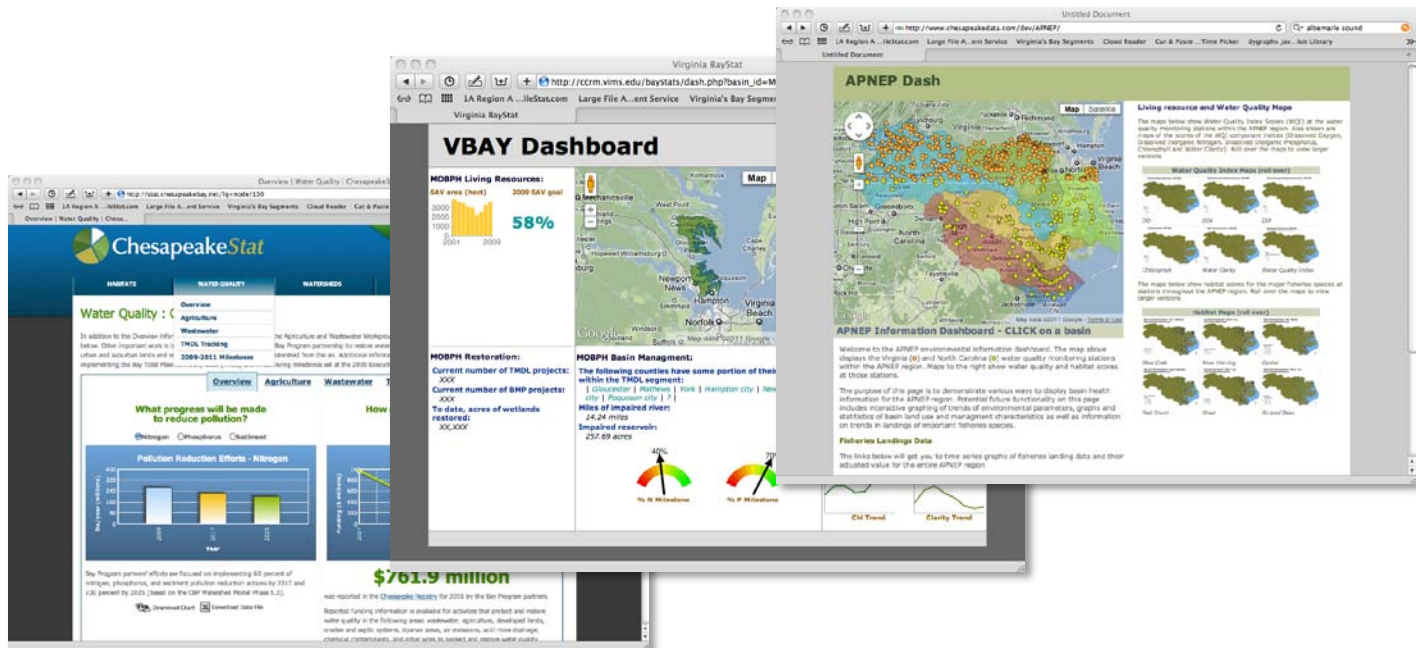
- Informative
- Engaging

Cons:

- Shelf life
- Limits on distribution

# Solutions

## Environmental Dashboards

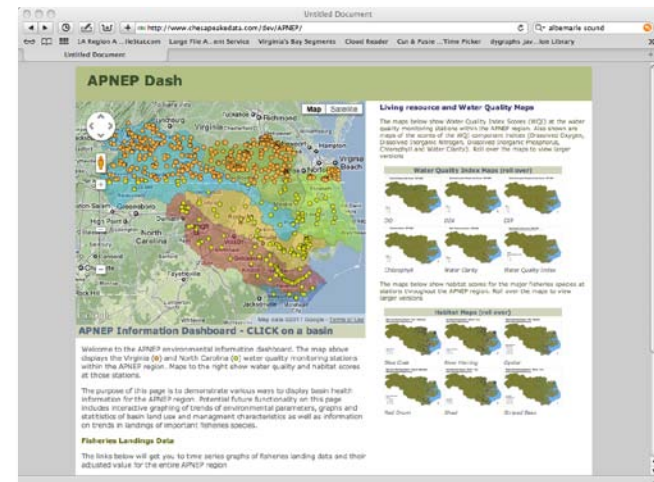


# Solutions

## Environmental Dashboards

### Pros:

- *Web-based so wide distribution*
- *Database driven so easily and quickly updateable*
- *Infinitely scalable*
- *Information can be presented at a range of detail to suit a broad audience*



# Solutions

## APNEP Dashboard

- Developed as a proto-type proof of concept
- Developed using open source solutions – PHP, MySQL, Google Maps, Google Charts
- Information on water quality, living resources, habitat and fisheries
- Information at scales from entire APNEP basin to sub river basin scales
- <http://www.chesapeakedata.com/dev/APNEP/>

