

Event Response in Chesapeake Bay

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September 13, 2012

STAC meeting, Annapolis, MD.

Outline

- Examples of Environmental Health events and responses for Chesapeake Bay and watershed.
- Response programming
- Chesapeake Bay Program partnership event-based activities
- Directions

Environmental Health Emergencies

Twin Cities Metro Advanced Practice Center (2007)

- Food and Waterborne Outbreaks
- Water safety and supply
- Food safety
- Sanitation
- Mass Care
- Vector control
- Solid Waste management
- Household hazardous waste
- Medical infectious waste
- Radiological incident
- Floods
- Tornadoes/Wind damage

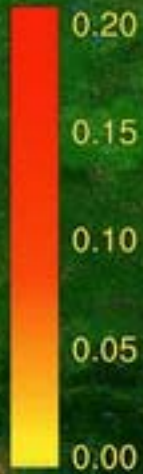
Response examples

- April 7, 2000 Patuxent River. Chalk Point Oil Spill
- Emergency crews from the Potomac Electric Power Company (Pepco) and federal and state agencies worked through the night to contain the oil.
- A Natural Resource Damage Assessment was initiated under the Oil Pollution Act by the MDE and MD DNR, NOAA, and USFWS.
 - These agencies would serve as trustees, acting on the public's behalf to investigate and assess the degree of harm that had come to the river, its wildlife, and the public services it provides - boating, swimming and fishing among others.
 - A Citizens Advisory Council was created.



Dilution Factor for dye injected within 20m of surface
Dye injected continuously for 2 month period
Days since spill: 132

Area supported for additional
baseline sampling through EPA



Area discussed for additional
baseline sampling through NRDAR

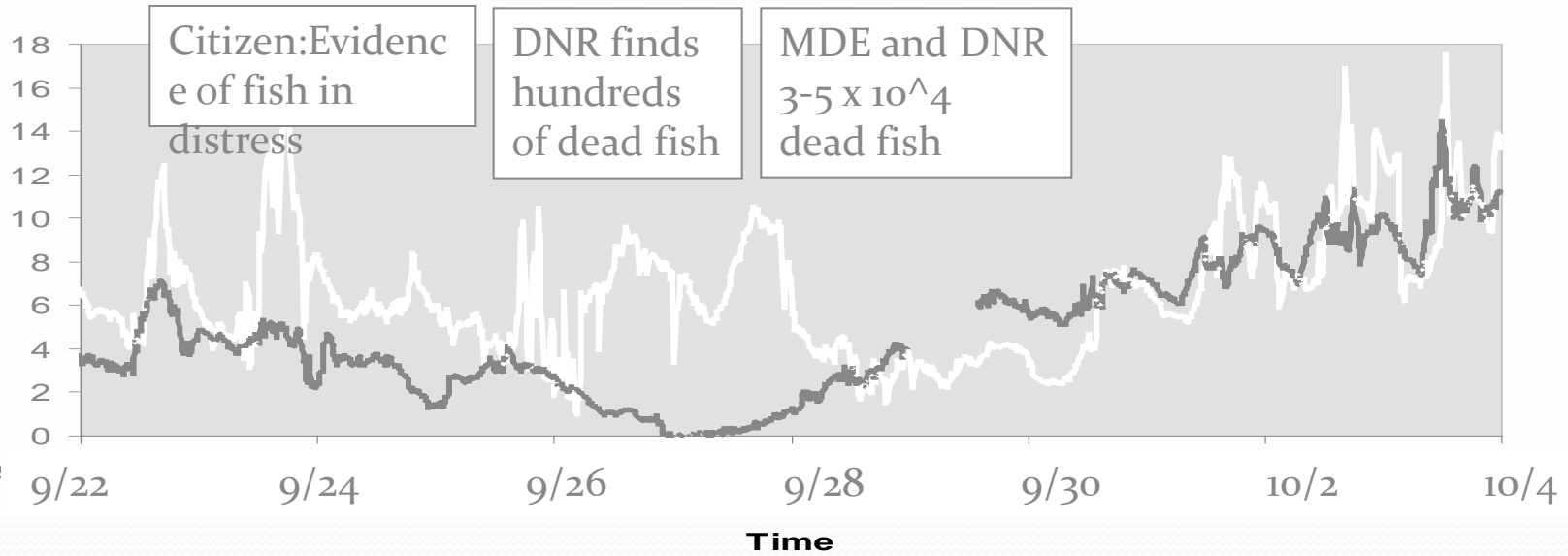


BP Oil Spill Flow Path Projection: June 3, 2010

HAB/D.O. Events: September 28, 2005 Corsica River, MD

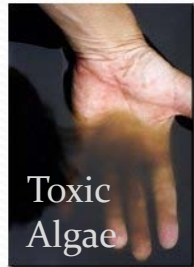
Estimated 30,000-50,000 fish dead; 15 species impacted

Dissolved Oxygen mg/L

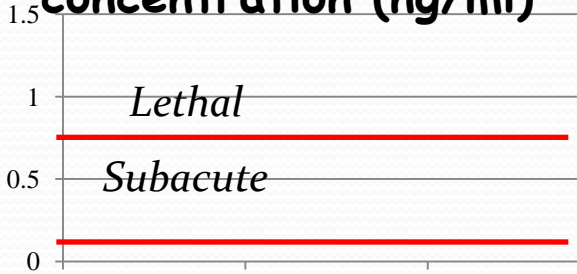


Karlotoxin

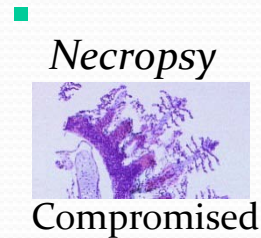
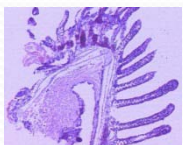
Sycamore Pt — Cedar Pt.



concentration (ng/ml)

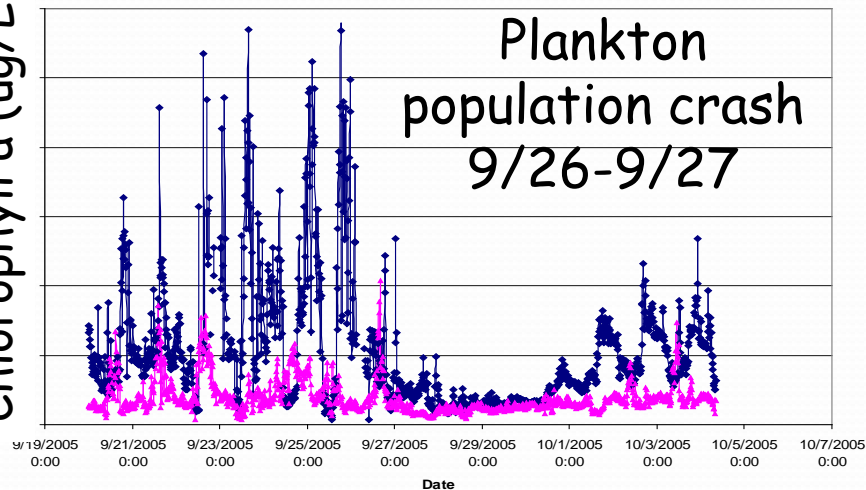


Karlodinium veneficum (toxigenic)



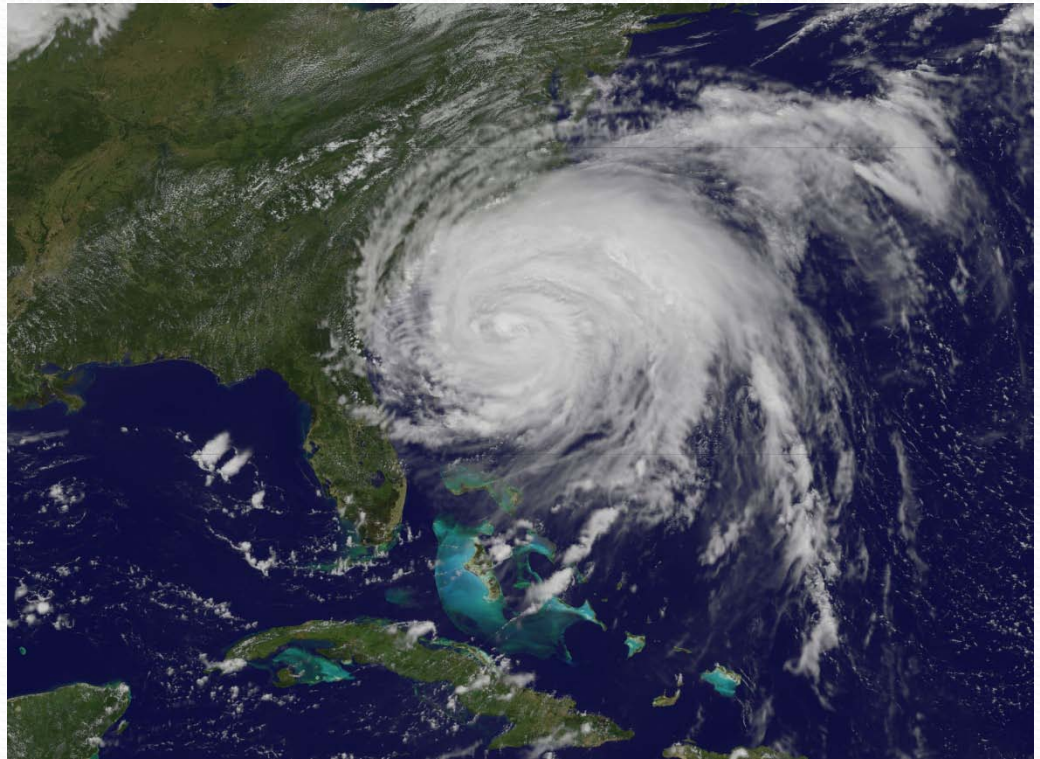
Chlorophyll

Chlorophyll a (ug/L)

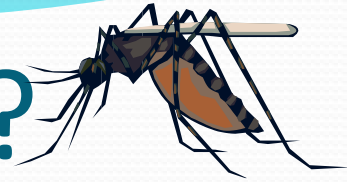


Hurricane Irene/Tropical Storm Lee

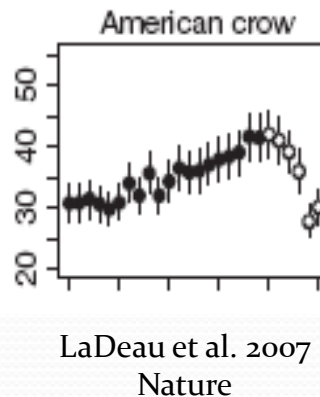
- Unprecedented temporal and spatial water quality monitoring coverage of these 2011 storms.
- Outstanding review of many monitoring efforts from the headwaters to the sea (April 2012).
- Paradigm shifting findings reported (Hirsch and others, 2012)



What about West Nile Virus?



- CDC developed and reviewed guidelines of surveillance, prevention and control of epidemic or epizootic cases of WNV in the United States.
- Many state laws provide monetary for state and local departments of health, sanitation, environment, or transportation to conduct mosquito abatement control consistent with federal, state and local laws.
- *“EPA is not directly involved with the reporting of dead birds or incidences of the West Nile virus. You should contact your state or local health department with any reports or concerns regarding the virus.”*



Human Deaths in Chesapeake Bay Partner Jurisdictions

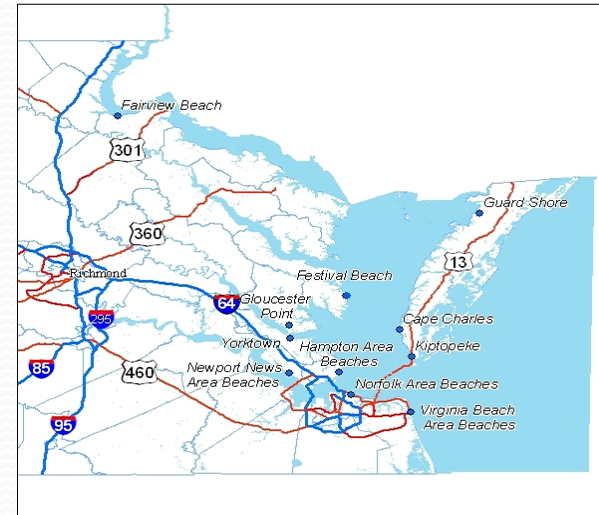
1999	7
2000	1
2001	5
2002	23
2003	30
2004	5
2005	6
2006	7
2007	3
2008	7
2009	0
2010	18
2011	20

What about invasive plants?

- <http://www.epa.gov/reg3esd1/garden/invasives.htm>
- Information supplied by EPA focuses on links to state and national programs regarding invasive species.
- Alliance for the Chesapeake - <http://www.acb-online.org/pubs/projects/deliverables-251-1-2005.pdf>
Citizens guide to control of invasive plants in wetland and riparian areas.

Bacteria events?

- County/State health reports
 - E.g. Virginia beach advisories
 - 303d listing assessments for long term tracking but not event response.



**2012 South River Federation Bacteria
(Enterococci) cfu/100ml**



#	Site	8/15/12	8/22/12	8/29/12
SR1	Hillsmere Shores	1	12	1
SR2	Glen Isle Community Assn.	10	22	12
SR3	Harbor Hills Assn.	12	14	40
SR4	South River Manor	70	40	18
SR5	Pine Whiff Community Assn.	70	62	52
SR6	South River Park Comm. Ass.	6	12	2
SR7	Selby Community Assn.	32	4	2
SR8	London Town Beach 5	12	18	8
SR11	Wilelinor Community Assn.	8	8	4
SR12	Shoreham Beach Citizens Assn.	6	8	28
SR13	Quiet Waters Park	1	2	1
SR16	Berkshire Community	36	28	104

- Watershed organizations (e.g. South River Federation)

Other events that could warrant consideration in managing expectations and tracking Bay recovery

- **Poaching/theft: Many Hatchery-Produced Oysters Illegally Harvested**
- **Introductions:**
 - **Blackwater National Wildlife Refuge has lost 50 percent of its wetlands (5,000 acres) since the introduction of nutria.**
 - **Gypsy moth caterpillars chewed their way through more than 1 million acres of the region's forests this year, 2007, making it the worst outbreak of the exotic pest in more than a decade.**
 - **The emerald ash borer (EAB) is an exotic beetle discovered in southeastern Michigan in the summer of 2002. By the end of 2008, EAB was established in Ontario, Michigan, Ohio, Indiana, Illinois, Missouri, Wisconsin, *Pennsylvania, Maryland, West Virginia and Virginia***
- **Diel hypoxia**
- **The Great Recession: socioeconomic events.**

Recent history regarding interest in formal event response activities for the Chesapeake Bay Program Partnership

- **2007: Discussion of a Regional Chesapeake Watershed Event Response Program through CRC.**
 - Initial Meeting, May 25, 2007
 - Draft report developed suggesting formal responses to events.
 - A universe of events was listed for potential response activities.

Chesapeake Bay Partnership Long-term Water Quality Monitoring Program

- Monitoring Realignment Decisions for the Monitoring Networks – November 2009.
 - Support (Clean Water Act 303d) delisting decisions of the tidal segments of Chesapeake Bay.
 - Dissolved oxygen, water clarity/SAV, chlorophyll, aquatic life (benthos).
 - Assess effectiveness of management actions in the watershed.
 - Nutrient and sediment load responses to management activities on the landscape.



Recommended investments

MRAT 2009, Table 3

- Data management support
- Stewardship of watershed information support
- Analysis: explaining water quality change, assessment of management effectiveness
- Implement small watershed monitoring filling gaps in land use and region representation.
- Synthesize lessons learned

Recommended Monitoring Program investments

MRAT 2009, Table 3

- Data management support
- Stewardship of watershed information support
- Analysis: explaining water quality change, assessment of management effectiveness
- Implement small watershed monitoring filling gaps in land use and region representation.
- Synthesize lessons learned
- And 2 more pages of recommended monitoring programming investments...
 - No recommendations were directed towards event response efforts.

Each jurisdiction has a dedicated staff and layers of operation capacity for emergency event management

Mr. Steven Kuhr, Chairman
New York State Emergency Response Commission
1220 Washington Avenue, Building 22, Suite 101
Albany, NY 12226-2251

Mr. John Rozman (for the Lt. Governor)
Pennsylvania Emergency Management Council
c/o Pennsylvania Emergency Management Agency
2605 Interstate Drive
Harrisburg, PA 17110-9364

District of Columbia Homeland
Security and Emergency
Management Agency
All-hazards operations

Mr. Rich Muth, Director OEM
Office of Emergency
Management
1201 East Cold Spring Lane
Baltimore, MD 31239

Delaware Emergency Management Agency
165 Brick Store Landing Road
Smyrna, DE 19977

COUNTY AND CITY OF WILMINGTON EMERGENCY MANAGEMENT

**New Castle County Office of Emergency
Management:**
(302) 395-2700, Fax (302) 395-2705
City of Wilmington Emergency Management Office:
(302) 576-3914, Fax (302) 571-5491
**Kent County Department of Public Safety,
Emergency Management Division :**
(302) 735-3465 , Fax (302) 735-3473
Sussex County Emergency Operations Center:
(302) 855-7801, Fax (302) 855-7800

Mr. Michael Cline, State Coordinator
Virginia Department of Emergency
Services
10501 Trade Court Road
North Chesterfield, VA 23136

Mr. Jimmy J. Gianato, Director
WV Division of Homeland Security
and Emergency Management
1900 Kanawha Blvd. East
Bldg. 1 – Room EB-80
Charleston, WV 25305

Key Federal Agencies have emergency event management priorities

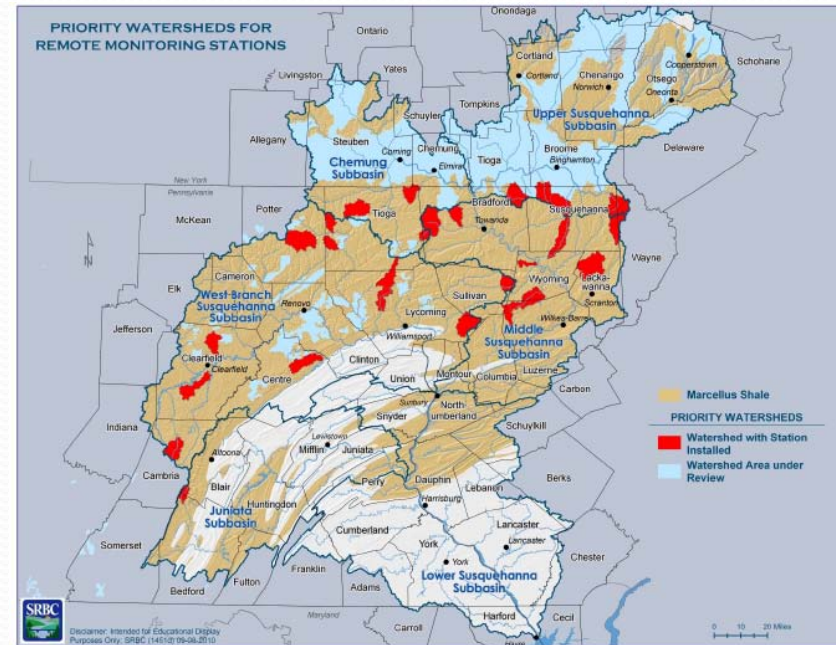
- USGS – flow/flood monitoring and assessment
- CDC – Centers for Disease Control - Environmental and human health surveillance
- FEMA – Federal Emergency Management Agency - Disaster mitigation, preparedness, response, recovery, education, and references
- FDA – Food safety
- EPA conducts time-critical and non-time-critical removal actions by either funding response actions directly or overseeing and enforcing actions conducted by potentially responsible parties.

CBP Event-based Activities

- Event response was not identified as a priority of the water quality monitoring networks by the partnership (MRAT 2009).
 - There is no general Event Response policy.
 - Every jurisdiction and agency, however, appears to have its own emergency management capacity and services.
 - There is no published list of Event Response objectives.
 - Advances in monitoring technology and their widespread application in the bay and basin allow us to be pre-programmed trackers of pre-event, event and post-event conditions instead of responders.

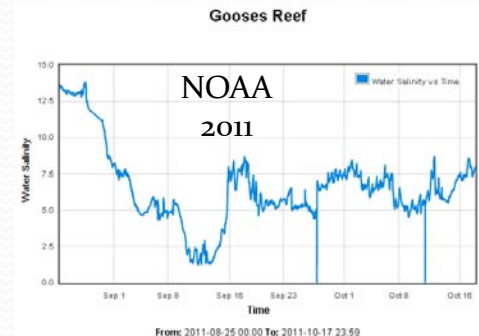
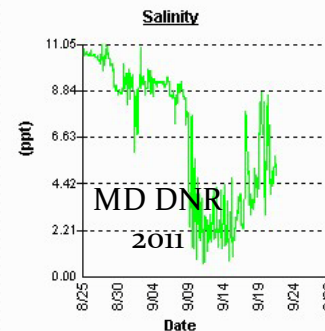
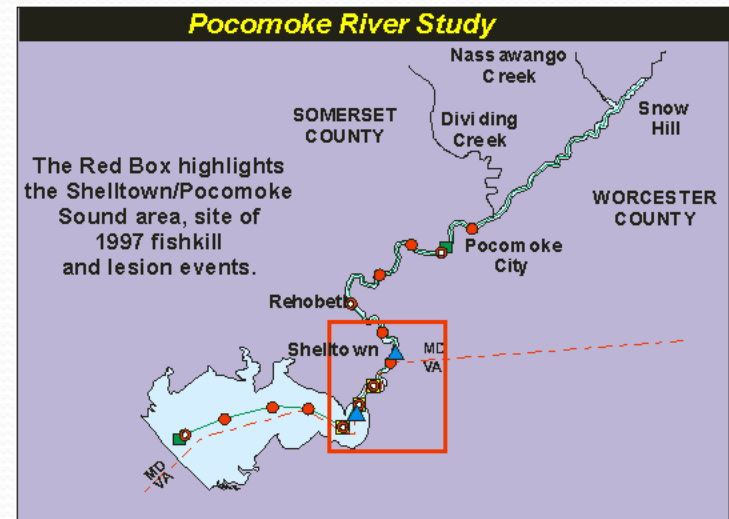
There are high priority objectives for applications of real-time monitoring

- **NONTIDAL WATERS:** Event-based monitoring is pre-programmed into the water quality monitoring network.
 - Storm sampling is a 117d grant requirement at our primary monitoring sites
 - Realtime flow measurements/event responses are conducted by USGS.
 - Realtime monitoring platforms are increasingly used across the watershed. Examples include:
 - SRBC Fracking related monitoring network (50 stations)
 - USGS realtime pilot studies – improved estimates of load and trends.
 - BMP assessments for small watersheds studies in PA, MD, VA, DE. - ditto.




There are high priority objectives for applications of real-time monitoring that capture water quality events

- TIDAL WATERS: More pre-programmed event sampling.
 - Since 1998, in-situ, realtime assessments have supported event-based monitoring.
 - Since 2004 we have a shallow water monitoring system (ConMon and Dataflow).
 - Other agency and institutions have similar infrastructure in place e.g. CBOS or CBIBS



CBP Event-based Activities

- Communication activities are conducted.
 - E.g. Irene and Lee:
 - Two months of weekly calls
 - email summary reports to jurisdictions.
 - News releases were developed and web published, etc.
 - Storm effects: early summary meeting (April 2012)
 - Ongoing analyses
 - Planning a conference on the storm effects (Dec 2012)
 - We do have a priority to synthesize lessons learned.
 - E.g. BMP lessons learned report, April 2012 Storm Effects meeting

- 
- CBPO has addressed requests for supplemental funding to support some event-related monitoring.
 - Irene and Lee 2012: Supplemental additional water quality cruise funding, MD sediment assessment funding.
 - BP Oil Spill 2010: Supplemental benthic assessments in VA, coast.
 - NOAA provided \$5K support for HAB-toxin testing in 2004.

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Environmental Health Events

Ecosystem Sustainability Framework

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High
public
interest

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Bay and Basin Health Framework

- Food and Waterborne Outbreaks
- Water safety and supply
- Food safety
- Sanitation
- Mass Care
- Vector control
- Solid Waste management
- Household hazardous waste
- Medical infectious waste
- Radiological incident
- Long term status and trends of loads and concentrations for nutrients and sediments, some key living resources.
- Floods
- Tornadoes/Wind damage



Thank you.