



**EVALUATION OF YEARS 1 & 2  
And PLANNING FOR YEAR 3**  
*Workshops held June 5 and 14, 2012*

Watershed Counts held two evaluation workshops to give its 48 project partners<sup>1</sup> an opportunity to comment on progress to date and make recommendations for improvement. Two workshops were held in order to accommodate as many people as possible. The first workshop was held on June 5, 2012 at the RIDEM offices in Providence. The second workshop was held on June 14, 2012 at the Bay Campus of URI. Both workshops were well attended with a combined attendance of 33. See attendance list (page 9). The following report summarizes the comments and discussion from these two workshops.

**Summary of Watershed Counts**

Each workshop opened with an overview of Watershed Counts progress to date. Nine indicators have been developed, some in a more refined state than others, but all based in solid, well vetted science. Links to the data behind Watershed Counts indicators are available on the Watershed Counts web site ([www.watershedcounts.org](http://www.watershedcounts.org)). The nine indicators are consistent with ecological indicators recommended for Narragansett Bay in 2003 by consultants to the Partnership for Narragansett Bay<sup>2</sup>, they provide an update to indicators developed by the Narragansett Bay Estuary Program in 2009 in the Currents of Change report<sup>3</sup>, and are consistent with indicators called for by the RI Bays Rivers and Watersheds Coordination Team enabling legislation.<sup>4</sup> A matrix showing how Watershed Counts indicators fit into these programs was distributed at the workshop and is included in Appendix A.

**General Watershed Counts Accomplishments**

- Watershed Counts has attracted stakeholders from the Massachusetts portion of the watershed. Massachusetts Department of Environmental Protection representatives have actively participated on the freshwater quality working group. Representatives from Massachusetts Department of Environmental Protection, Audubon Society of RI, the Taunton River Watershed Alliance, The Nature Conservancy's Massachusetts office and other organizations have attended Watershed Counts workshops for the other indicators.

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<sup>1</sup> Watershed Counts Partner list on last page (page 10) of this report

<sup>2</sup> Ecological Indicators for Narragansett Bay and its Watershed, Kleinschmidt 2003  
[http://www.ci.uri.edu/Projects/PNB/Chafee-HUD/Indicators\\_Final.pdf](http://www.ci.uri.edu/Projects/PNB/Chafee-HUD/Indicators_Final.pdf)

<sup>3</sup> Currents of Change, Environmental Status and Trends of the Narragansett Bay Region  
[http://www.nbep.org/currents\\_change/about\\_narragansett\\_bay\\_region.html](http://www.nbep.org/currents_change/about_narragansett_bay_region.html)

<sup>4</sup> RIGL 46-31-9

- Watershed Counts indicators are based on solid science that is developed through professional protocols and serves as a diagnostic tool like an MRI or CT scan. The linkages between the Watershed Counts metric and the data sources are clear and easy to follow. The Watershed Counts website and reports (all available at [www.watershedcounts.org](http://www.watershedcounts.org)) include linkages to the data.
- The project has had the strong cooperation of diverse stakeholders. The partners have all agreed to the following principles: 1) information presented to decision makers and the public reflects their input; 2) Watershed Counts does not go public with information until it has been reviewed at a public workshop; and 3) incomplete information is not presented.
- The State House roll out event has been well-attended for the past two years with high energy and good press coverage. Copies of the report and posters were distributed to each RI legislator. Media coverage associated with the event included a story in the Providence Journal, coverage on WRNI (npr radio), a story in ecoRI, and an interview with WRNI. The fresh water quality metrics were presented at the Rally for the Valley in Uxbridge, MA, (June 1, 2012) reaching a targeted audience of MA decision makers. In 2012, additional coverage for the Watershed Counts information came from the Narragansett Bay Journal re-publishing the metrics in the June edition. EcoRI and the Salt Water Anglers have asked permission to re-publish several of the Watershed Counts articles, allowing Watershed Counts to reach the wide and diverse audience for which this information is intended.

## **Recommendations for improving Watershed Counts**

**Reaching legislators:** The State House event is well attended and well organized, but only a few legislators join the audience of federal, state and local leaders. And although the reports and small posters are delivered to each RI legislator's mailbox, we do not yet have a reliable way to measure how many read it and what impact the information has. We are considering another time of year to ensure a higher profile event and to increase the likelihood of legislator attendance. The group suggested the possibility of a presentation to the House/Senate joint environmental committees (in January). One-on-one meetings with legislators would also be a helpful way to gather comments and feedback on the Watershed Counts information allowing discussion of the application of the indicators to local issues.

**RI State House event:** The layout of the room makes it impossible for the audience to see the posters. The posters are one of the big highlights of the work and should be featured more prominently. The script and the press release for the event will be posted on the web site.

**Reaching local decision makers:** Watershed Counts defines local decision makers as a prime audience, but workshop participants questioned whether we are reaching this audience and whether the Watershed Counts information is useful to local decision makers. Participants in the first workshop who work closely with local decision makers (NBNERR, RIDOT, Kickemuit River Council) pointed out that local planners, council members, etc. are overwhelmed. If we

want them to take action, we need to provide specific direction and make clear links to the economy. The group had an excellent suggestion to use regional meetings to gather input from local decision makers and municipal officials (Washington County Regional Planning Council and the Aquidneck Island Planning Commission are possible organizations to host regional discussions).

## **Recommendations for improving communications and outreach**

**Posters:** Workshop participants were generally enthusiastic about the Watershed Counts posters, but some gave recommendations for improvement:

- Simplify the small 8.5 x 11 posters. The detail is difficult to read at the small scale.
- Include the arrows for status and management on the poster.
- Each poster should state its main message in a large font.
- Develop a poster with the overall story for the year that explains what the metrics are telling us
- Posters need to have a clear message. Although Watershed Counts is not an advocacy organization, the posters can be designed so a reasonable person will “get the message” (A theatrical performance sets up a message so the audience “decodes” the desired and predetermined emotional response. We can do the same with the Watershed Counts communications).
- Some of the posters (Marine WQ was mentioned at the second workshop) are overwhelming. They contain a lot of information and do not easily lead the reader to the take home message.

## **General Communications**

The workshop attendees felt that Watershed Counts is heading in the right direction, but needs to continue to simplify and focus the overall message and the message for each indicator. The more complex explanations can be part of the spoken message and on the Web site. As we move forward, we need to be sensitive to the conflict between scientists’ desire to display data that include scientifically valid numbers reflecting the condition of natural resources and the ability of the public to extrapolate complex systemic interactions through graphs and data. Each graph should include a text box that tells the story. We should also consider translating numbers into language that communicates clearly and impacts both the rational and emotional perception of the message (e.g.: LSU presents wetlands loss in football field units).

The one message that is consistent throughout Watershed Counts is the importance of on-going monitoring. Decision makers and the public do not fully understand why the state needs an on-going investment in monitoring. We should consider how to highlight this even more in future posters and reports. People need to see monitoring as the CT scan, MRI and X-ray determining the health of the environment.

Watershed Counts is pleased to have partner organizations take copies of the posters to use. The group recommended developing a traveling display for the state’s library system to expand opportunities for the public to review the posters and report.

## **Watershed Counts metrics:**

**General Comments:** Watershed Counts should strive for a clear concise metric for each indicator. The metric should show changes over time and should be based on available data. Watershed Counts should clearly demonstrate how the indicator is linked to outcomes of concern.

### **Invasive Species**

#### Metric:

RIDEM is implementing EPA ballast water regulations. Perhaps this is a management action that Watershed Counts could track.

#### Communication:

- RIDEM web site has a useful 5 stage graphic describing response to invasives (<http://www.dem.ri.gov/programs/benviron/water/quality/surfwg/aisplant.htm>)
- The poster and report need to be more specific – what does “rapid response” mean?
- The colored block on the poster is missing from the poster on the web site.
- Change language – 80 lakes ARE infested (rather than were), typo on “invasives” on left side of poster
- Participants disagreed with the statement, “sustained monitoring = proactive management”. Both are needed but monitoring alone is not sufficient for management.
- It would be useful to include photos of specific species – close up – along with the photos of infested lakes.

### **Marine Water Quality**

#### Metric:

- The indicator is based on the Integrated Report, state’s bi-annual report to EPA on water quality. The assessment is done every 2 years, but the underlying data are monitored consistently.
- The 2012 poster is packed with good information but is confusing. The numbers are buried and the take home message is not clear. Watershed Counts can show the % of time that the standard is exceeded. Another suggestion was to report on the area (acres) of the bay that is impaired.
- The group considered whether to show a higher level of analysis, indicating a gradient of water quality moving down the bay but agreed that this level of detail would be confusing for the legislature. The web site provides a good site for a more thorough examination of the issue.
- The DO map shows an odd gap in the MA portion of Mt. Hope Bay where water quality is meeting standards in MA but not in RI. Sue Kiernan (RIDEM) said that this is likely due to less frequent monitoring in the MA portion of the Bay.

- RI will likely see an improvement in water quality in 2014 when the two Narragansett Bay Commission plants go on line with advanced treatment.

Communication:

The group suggested eliminating the graphs, and use instead a graphic or text describing why low dissolved oxygen is problematic. The State of Wisconsin has a useful graphic showing fish gasping at low DO.

Participants recommended using a more muted color (rather than bright red) – the red color suggests that the water is in terrible condition.

**Freshwater Quality**

Metric:

Participants asked Watershed Counts to consider how to report on water quality trends.

Communication:

- The symbols/colors communicate well. Watershed Counts' goal is to have "clickable" maps that link to the underlying data.
- The posters are missing a take home message. What does all this mean? The message in the report was confused, both encouraging use of urban rivers and describing water quality impairments.
- The language on the poster (acceptable, not acceptable) is confusing.

**Open Space (consider renaming this "Protected Open Space")**

Metric:

- This is not an easy metric, as Watershed Counts won't report on changes from year to year. A recommendation was to connect to management priorities and track land use changes inside and outside of Rhode Island's Urban Services Boundary (USB).
- The group thought that Watershed Counts should clearly describe the linkage between open space numbers and water quality.
- Goals for open space protection could be used to put the watershed counts numbers into context. The RI State Wildlife Action Plan will be completed in the next year or so and may provide a useful framework for looking at land conservation.
- Land trusts in southern RI often protect land for groundwater protection. They rarely are looking at the protection of surface water, in part because the waterfront properties are too expensive.

Communication:

The open space map on the poster could be mis-interpreted. Is all the tan area bad? The black line on the open space map obliterates the shoreline areas.

## **Economics (“Clean Water has a ripple effect on RI’s economy”)**

### Metric:

The group considered various economic metrics for Watershed Counts to include:

- Investments in drinking water protection
- Trends in beach use over time
- CRMC public access areas locations and available parking. (Parking is a real problem).
- Economic opportunities that are directly linked to water quality improvements. For example, there is more recreational use of the Blackstone River now that water quality has improved.
- Recreational fishery numbers. The RI Saltwater Anglers Assn has recently completed a study showing economic impact in RI of saltwater recreational fishing (<http://www.risaa.org/EconomicStudy07.pdf>)
- Fishing permits or shellfishing permits
- Watershed Counts could focus on the recreational sector, then report on the various sub-sets

### Communication:

The graph from the RIDEM outdoor use survey should be replaced with a graph that shows more enthusiasm for outdoor activities. The current graph’s 35% is not an impressive number. The term, “Natural Resource Economics” is meaningless to most people. The poster includes language that is too complex/obtuse.

## **Climate Change**

### Metric:

- What can be said on an annual basis about Climate change?
- Could we also measure heat days, drought?
- The spring tide events that CRC, CRMC and STB have been monitoring and photographing could be used in the message for climate change. They also have volunteer “stormwatchers” who are collecting information that might be useful.
- Watershed Counts could track # of communities addressing climate change in local plans
- Or the # of people living at different levels above sea level (Rebecca has an interesting paper that she will share that shows the number of RI homes at risk)

### Communication:

- The line graphs on the poster are hard to interpret.
- CRMC/CRC have developed powerful maps showing coastal areas under water as sea level rises.
- The maps showing how states are moving south (RI now has the weather of northern New Jersey) communicate well
- We could show the South Kingstown beaches before and after the big storms. Or Mattunuck through time.

### **Beach Closures**

Beach closure events is a good metric. It is data that HEALTH collects each year and it communicates well.

### **Flow**

#### Metric:

- Watershed counts should be looking at some key questions – over time, is flow depleted? What is happening to peak flows? And how is this summarized statewide.
- HEALTH has been working on an examination of the impacts of climate change on water supplies. It is possible that this study will have useful information on changes in flow.
- Could URI NRS help with the data analysis, looking at trends in the data?

#### Communication:

Would it be possible to create a map similar to the water quality map showing areas where flows are being depleted over time, and areas where peak flows are increasing?

### **Impervious Cover**

#### Metric:

- IC is not going to change on a year to year basis. Should Watershed Counts track passage of municipal ordinances to address IC?
- Glenn Archetto (student in YQ Wang's lab) has been working for the CI, helping the Watershed Counts project. He has analyzed satellite data to look at the change in urban land use (a surrogate for IC) in the 2010 data. His work adds to YQ's timeline, allowing a comparison to be made between 1972, 1985, 1999 and 2010. The earlier work can be seen at <http://www.edc.uri.edu/ricl/>.
- As sea level rises, lands built on fill are also at risk.
- Can we connect floods (peak flow) with changes in IC over time?
- RIDEM Office of Water will be looking at the relationship between IC and macroinvertebrate communities, and will be examining the rule that water quality is not impaired until IC reaches 10% in a watershed. The goal is to develop a rule that is accurate for RI.

### **Other Indicators to consider**

Population shifts. The movement of population out of urban centers and sprawling suburban development is driving many of the changes we are reporting on (eg: Open Space, IC, water quality)

Tracking population habits (recycling)

### **What linkages should Watershed Counts take advantage of?**

- EPA signature project hopes to link to the Watershed Counts website.

- The National Association of Conservation Districts (NACD) will be partnering with the New England-[New York Forestry Initiative](#). There might be opportunities for shared metrics/messages.
- We should do a better job linking with RI Stormwater Solutions at URI Cooperative Extension.
- EPA and TNC are both developing regional, geographically based initiatives covering the area from LI Sound to Buzzards Bay. This is an opportunity to coordinate on messaging, identification of challenges, and to line up governance actions with public perceptions.
- Statewide Planning has just started a 2-year project to develop a sustainable communities regional plan. The planning project will include an analysis of developable land, mapping habitats, impervious cover, etc. and will feed into the state guide plan.

### **Conclusion:**

Workshop participants were generally positive about the Watershed Counts project. A diverse range of agencies and organizations are working together as the Watershed Counts collaboration. All who were represented at the workshop are pleased to share the Watershed Counts information, report and posters with their managers, board and stakeholders. Participants agreed that the project is making measurable progress towards its goal to create a shared array of status and trends metrics which can be used to describe the Narragansett Bay watershed. There is still a lot to do but the participants in the workshops were committed to working with Watershed Counts on continued refinement of the current metrics and the addition of a select number of additional metrics.

Walter Berry (EPA ORD) closed the second evaluation workshop with words of praise for the project, "I use Watershed Counts as an example of a program that is doing it right. I believe that the focus on getting tools to the decision makers is exactly correct. They talk to those who will use the indicators as well as the developers. They also hold broad based discussions after the fact, as well as during the development of the indicators, so that the indicators and communications can be further improved."



## WORKSHOP ATTENDEES

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**NARRAGANSETT BAY**  
**WATERSHED**  
**COUNTS**  
**ECONOMY • ENVIRONMENT • EQUITY**

Aquidneck Land Trust  
 Audubon Society of Rhode Island  
 RI Bays, Rivers, and Watersheds Coordination Team  
 Blackstone River Coalition  
 Blackstone River Watershed Council / Friends of the Blackstone  
 Green Nursery  
 Clean Water Action  
 Conservation Law Foundation  
 Ecobest Inc.  
 ecobest Bikes  
 Friends of the Mashapaug  
 Great Smack Rhode Island  
 Hixon & Associates, Inc.  
 Massachusetts Audubon Society  
 Massachusetts Department of Environmental Protection  
 Narragansett Bay Commission  
 Narragansett Bay National Estuarine Research Reserve  
 Narragansett Bay Estuary Program  
 Narragansett River Preservation Association  
 Town of North Kingstown, Department of Planning and Development  
 Office of Senator Sheldon Whitehouse  
 Rhode Island Resource Conservation & Development Council, Inc.  
 Rhode Island Natural History Survey  
 Rhode Island Nursery and Landscape Association  
 RI Coastal Resources Management Council  
 RI Department of Administration  
 RI Department of Environmental Management  
 RI Department of Health  
 RI Department of Transportation  
 Rhode Island Land Trust Council  
 RI Water Resources Board  
 Save the Bay  
 Surfrider Foundation  
 South Kingstown Land Trust  
 Taunton River Watershed Alliance  
 The Nature Conservancy  
 The Rhode Island Foundation  
 The Trust for Public Land  
 URI Coastal Institute  
 URI Cooperative Extension  
 URI Graduate School of Oceanography  
 URI Watershed Watch  
 U.S. Environmental Protection Agency, Atlantic Ecology Division  
 U.S. Environmental Protection Agency, Region 1  
 U.S. Fish and Wildlife Service  
 White Memorial Conservation Center  
 Wood Paucatuck Watershed Association  
 Woonasquettoc River Watershed Council



**APPENDIX A: Indicator Matrix**

**Green** – addressed by WC 2011 or 2012

**Blue** – data in place for possible WC metric for 2013

**KS03** – Ecological Indicators for Narragansett Bay and its Watershed, Kleinschmidt Aug 26, 2003

**CT** required by RIGL 46-31-9 (Coordination Team enabling legislation requirements for Env Mon Collab)

**NBEP** included in NBEP 2009 S&T

REF	Ecosystem Characteristic	Recommended Indicators	Watershed Counts Metrics	Possible next steps
<b>KS 03</b>	<b>Landscape Composition and Use Indicators and Metrics</b>			
<b>KS 03</b>	Shoreline Buffers	Miles of Bay shoreline with adequate natural buffers		
<b>KS 03</b> <b>NBEP</b>	Impervious Surface	Aerial extent of Impervious surface - build out potential - % IC	2011 % IC for watershed and by town in RI based on RIGIS  2012 LID inventory (Lorraine Joubert)  Conservation Development Inventory (Jen West)	YQ and Glenn – looking and changes in IC based on satellite data ( <a href="http://www.edc.uri.edu/ricl">http://www.edc.uri.edu/ricl</a> )  RIDEM (Alisa R.) may be updating, expanding the inventory
<b>KS 03</b> <b>CT</b>	Shoreline Buffers	River and pond miles with adequate natural buffers		TNC has prepared analysis of 300 foot buffer of National Hydrologic Data rivers and ponds, C-CAP land cover data and TNC protected open space.

REF	Ecosystem Characteristic	Recommended Indicators	Watershed Counts	Possible next steps
KS 03 NBEP	Protected Undeveloped Land	Percent natural land protected and connectivity of this land  Percent agricultural land	2012 reported on % undeveloped in RI based on RIGIS data	TNC has prepared analysis of watershed region using TNC's regional open space data layer (different from RIGIS) overlain with C-CAP Land cover data which can be used to assess land use (22 classes)
KS 03	Population Density			
KS 03	<b>Habitat Condition Indicators and Metrics</b>			
KS 03	Coastal Wetlands	Acres of coastal wetland by type and function  Length of coastal wetland shoreline edge		
KS 03	Benthic Habitats	Extent of submerged land substrate types (rocky, sandy)  Acres of submerged aquatic vegetation and patchiness		TNC has prepared analysis of watershed region using TNC's regional open space data layer (different from RIGIS) overlain with C-CAP Land cover data which can be used to assess land use (22 classes – including palustrine aquatic bed and estuarine aquatic bed)
KS 03	Anadromous Fish Habitat	Miles/acres of accessible suitable riverine spawning habitat		
KS 03 NBEP	Freshwater wetlands	Acres of freshwater wetlands by type and function  Length of freshwater wetland shoreline edge		TNC has prepared analysis of watershed region using TNC's regional open space data layer (different from RIGIS) overlain with C-CAP Land cover data which can be used to assess land use (22 classes – including several wetland

				classifications)
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REF	Core Indicator	Metrics	Watershed Counts	Possible next steps
KS 03	Forested Lands	Acres of forested land  Extent of intact core habitats (dependent on target species)		TNC has prepared analysis of watershed region using TNC's regional open space data layer (different from RIGIS) overlain with C-CAP Land cover data which can be used to assess land use (22 classes – including forested land)
CT NBEP	Invasive Species	Terrestrial and Freshwater Invasive Species	2011 – DEM presence/absence, FW Lake assessment. Identified representative species for indicator metric that combines presence and management	Continue development of metric
KS 03	<b>Water and Sediment Condition Indicators and Metrics - Bay</b>			
KS 03 CT	Water Temperature	Mean T	Included in Climate Change assessment	
KS 03 CT	Salinity	Freshwater influx		
KS 03 CT NBEP	Oxygen	DO levels Redox potential discontinuity depth as a measure of oxygen in sediments	Used state assessments based on fixed buoy data and insomniac surveys	
KS 03 CT	Nitrogen	Total N loading		
KS 03 CT	Pathogens	Presence		
KS 03	Metals	Presence and conc Conc of Acid Volatile Sulfide as a measure of the bioavailability of metals in sediments Tissue analysis		
KS 03	Organics	Presence and conc		



KS 03	TSS	Mass and toxic concentrations		
<b>REF</b>	<b>Core Indicator</b>	<b>Metrics</b>	<b>Watershed Counts</b>	<b>Possible next steps</b>
KS 03 CT	Flows and Circulation	Freshwater inflow Groundwater inflow Bay circulation patterns Frequency of stratification		
<b>NBEP</b>	Beach Closures	Closure events per season	2011 and 2012 Based on HEALTH beach data	
KS 03	<b>Water and Sediment Condition Indicators and Metrics - Watershed</b>		2012 Assessment used RI and MA integrated report, synthesizing a wide range of water quality parameter	
KS 03 CT	Water T	Mean T		May be included in DOH Climate project
KS 03 CT	pH	pH in lakes and rivers		
KS 03 CT	Oxygen	DO in lakes and rivers		
KS 03 CT	Phosphorus	Phosphate concn		
KS 03 CT	Nitrogen	TN connc		
KS 03 CT	Pathogens	Presence (CSO, Stormwater, ambient)		
KS 03	Metals	Presence and conc Conc of Acid Volatile Sulfide as a measure of the bioavailability of metals in sediment Tissue analysis		
KS 03	Organics	Presence and conc		
KS 03	TSS	Mass and toxic conc		

REF	Core Indicator	Metrics	Watershed Counts	Possible next steps
KS 03 CT NBEP	Hydrology Flow	Mean annual August monthly flows Groundwater Flow	2011 reported on FW Resources, showing water seasonal water use, flow impacts in the Hunt	gage data - 7 day min & max compared to unimpacted gage  water use/availability
KS 03	<b>Fish and Wildlife Populations and Biodiversity – Bay indicators and Metrics</b>			
KS 03 CT NBEP	Fish and invertebrates	Assemblages and relative abundance across each bay habitat gradient		
KS 03 CT	Shellfish	Assemblages and relative abundance across north/south habitat gradient		
KS 03 CT	Benthic organisms	Assemblages and relative abundance across north/south habitat gradient		
KS 03	Birds and Marine Mammals	Assemblages and relative abundance across north/south habitat gradient		
KS 03	Chlorophyll	Chlor per unit area		
KS 03	Primary production	Net Primary Production (NPP)		
KS 03	<b>Fish and Wildlife Populations and Biodiversity –</b>			

	<b>Watershed indicators and Metrics</b>		
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REF	Core Indicator	Metrics	Watershed Counts	Possible next steps
KS 03 CT	Fish and Invertebrates	Assemblages and relative abundance	EPA Urban Waters Grant – develop fish monitoring protocol and assessment for urban rivers 2013/14	
KS 03 CT	Macroinvertebrates	Assemblages and relative abundance across north/south habitat gradient		
KS 03	Birds and Mammals	Assemblages and relative abundance across north/south habitat gradient		
KS 03	Reptiles and amphibians	Assemblages and relative abundance across north/south habitat gradient		
KS 03	Chlorophyll	Chlor per unit area Lake eutrophication status		
KS 03	Primary Production	Net Primary Production		
	Natural Resource Economics	Evaluated non market social value of RI beaches		
	Climate Change	NOAA data on sea level rise, URI GSO phytoplankton lab data on water T, NE integrated Science and Assessment data on storminess		Links to ongoing work on CC, including possible HEALTH/CDC project looking at CC and health
NBEP	Shellfish Closures			
NBEP	Seagrass			
NBEP	Chloride in lakes			