

Charrette Visualization Challenges

1) Global Change in Local Habitats – The effects of global climate change will have widespread implications on local habitats. For example, sea grass beds and marshlands serve as prime nurseries for numerous species but as sea level raises these habitats will be lost. (Hannah & David)

Potential Questions for Discussion

- How do we emphasize that small changes can have huge impacts, both in terms of consequences and spatial area?
- How do small changes in sea level, temperature, pH, etc. effect large-scale marine ecosystems?
- In what ways can we make climate information more tangible to real-world experiences and problems (that is, those that are relevant today)?
- How can we visually show how the ocean changes on different time and spatial scales?
- How will monitoring by IOOS help us measure and adapt to these changes?

Possible Datasets & Science Resources

- Chesapeake Bay Example <http://noaa.chesapeakebay.net/docs/FAQClimateChangeinCB8.o8.pdf>
- Chesapeake Climate Impacts Info <http://chesapeakebay.noaa.gov/climatechange.aspx>
- Sea Level Rise <http://tidesandcurrents.noaa.gov/sltrends/>
- Chesapeake Bay Sea Grass Survey http://www.dnr.state.md.us/coastalbays/living_resources/coast_bay_grasses.html
- Maps of areas vulnerable to sea level rise from EPA http://www.epa.gov/climatechange/effects/coastal/slrmaps_ma_cb.html
- Coastal relief maps from <http://www.ngdc.noaa.gov/mgg/coastal/grddas02/grddas02.htm>
- Population density maps <http://sedac.ciesin.columbia.edu/place/mapCollection/All>
<http://maps.howstuffworks.com/united-states-population-density-map.htm>
- Sea grass distribution and other valuable Chesapeake Bay maps at <http://www.chesapeakebay.net/animalsandplants.aspx?menuitem=13943>

2) Impacts of Coastal Storms – Storms and hurricanes can cause tremendous damage on land, but they also greatly affect ocean habitats. Sea level, coastal currents and satellite data can be used to show the impacts these storms have on both human and marine environments. (Dan & Sage)

Potential Questions for Discussion

- Is there a way to emphasize both the positive (i.e. coastal mixing) and negative (flooding) aspects of storms?
- How can we portray that while climate trends are predicted to be small, the trend in variability (i.e. storms) is predicted to be more significant – and relevant?
- Can we visualize dynamic storms, and their large scale and impacts, in static ways?
- How can we represent the temporal (time series) dimension of storms?
- How can we demonstrate how IOOS will help us predict, prepare and monitor coastal storms?

Possible Datasets & Science Resources

- NOAA Environmental Visualization <http://www.nnvl.noaa.gov/>
- Tropical Storm Ernesto http://marine.rutgers.edu/cool/coolresults/2006/ASBA/ASPBA_glenn.ppt (slides 37-61)
- Tropical Storm Hannah <http://marine.rutgers.edu/~sage/hanna2008.gif>
- Tropical Storm Beryl http://marine.rutgers.edu/~sage/Beryl/anim_codar.gif

3) Harmful Blooms and Beach Closures – Harmful algal blooms and poor water quality are responsible for increasing illnesses among coastal residents. Monitoring these conditions and helping people make choices to abate or avoid these hazardous situations is a pressing concern. (Laura)

Potential Questions for Discussion

- How can we combine spatial and point monitoring data into coherent products?
- In what ways can ocean data be used to relate information on health hazards?
- How can we demonstrate how IOOS can help?

Possible Datasets & Science Resources

- Florida Red Tide Data (real-time and historical) <http://floridamarine.org/features/default.asp?id=1018>
- NOAA HAB Forecasting System <http://tidesandcurrents.noaa.gov/hab/>
- NOAA Harmful Algal Bloom Bulletins http://coastwatch.noaa.gov/hab/bulletins_ms.htm
- NRDC Beach Closure Report <http://www.nrdc.org/water/oceans/ttw/titinx.asp>

4) Ecosystem-based Fisheries Management – A tremendous effort is now underway to use OOS data to help understand, monitor and protect marine ecosystems. For example, fisheries researchers in Alaska and New York are using ocean currents (from radars and ADCPs) and vertical profiles of water column properties to better understand the transport and fate of fish larvae. This new information will help policy makers better manage fish stocks. (Ned)

Potential Questions for Discussion

- How can we emphasize the fact that the ocean is a moving habitat?
- In what ways can we use IOOS data to monitor ocean ecosystems?
- How can we connect IOOS datasets with fisheries and Census of Marine Life data? Are there other biological connections?

Possible Datasets & Science Resources

- Modeling of Larval Transport in Alaska http://www.gis.ucar.edu/o8workshop/pdf/Tiffany_Vance.pdf
- Transport in the Hudson River Plume <http://marine.rutgers.edu/cool/coolresults/2006/MTS/scott/MTS-Glenn-Latte.ppt>
- Drifter Tracks http://marine.rutgers.edu/cool/coolresults/2007/scott_tianjin/sw06_drifters.avi
- Glider Temperature Ribbons http://marine.rutgers.edu/cool/coolresults/2007/josh_ESEEO/sw06GliderRibbon6fps.avi