



USER NEEDS ASSESSMENT: MARINE OPERATIONS

9/26/14

Key topics	User Needs and Goals*	Key Products or Services Needs	Key Variables/Data Types Needed	Current SECOORA (and partner) products/services**
Safety and Navigation	Safe and efficient coast and ocean transit and operations--shipping, fishing, recreation, ferries, etc. includes scheduling and routes; Safe passage into and inside ports, harbors, marinas, passages--scheduling, routes, keel clearance, pilot boarding decisions, port status	Nowcasts and forecasts with visualization tools for coast and open ocean	Near real-time offshore wind, wave, currents, temperature (air and sea), atmospheric visibility, bathymetry, AIS vessel tracking, navigation charts	Nowcast/forecast of regional ocean circulation model (currents and temperature); addition of waves is expected in Year 4. SECOORA real-time data and maps portal Marine weather portal
		Nowcasts and forecasts with visualization tools near and in major ports, harbors, passages	Above variables but at higher resolution for nearshore and harbors, plus water level and water density	Storm surge and wave models run by member institutions for estuaries and ports and harbors (Tampa Bay, Charlotte Harbor, North Carolina, North Atlantic) Marine weather portal
Search and Rescue	Improved search and rescue efforts, including efficiency and safety of operations	Hindcasts, nowcasts and forecasts for visualizations, modeling and delivery into tactical SAR decision tools	Near real-time wind, wave, surface and subsurface currents, temperature (air and sea), atmospheric visibility and cloud cover	Hindcast of regional ocean circulation model is planned in Year 4; WFS high resolution hindcast/nowcast and forecast; North Atlantic, GA, SC, FL
Oil Spill and Response	Rapid effective response to spills or floatable debris, including decisions re type and location of containment efforts, clean up and wildlife rescue. Determine origin.	Hindcasts, nowcasts and forecasts formatted and delivered to NOAA OR&R spill modelers and responders	Near real-time winds, waves, surface and subsurface currents and water density	Nowcast/Forecast of waves, salinity, surface and subsurface currents regional scale ocean model. Hindcast of regional scale ocean model is planned in Year 4. Marine weather portal; West Florida Shelf Nowcast/forecast and hindcast circulation models
		Spill trajectory tools as requested by users for spills not covered by OR&R, e.g. small spills, some contaminants, planning and drills	Same as above	Spill trajectory models run by member institutions (West Florida Shelf and South Atlantic Bight Gulf Of Mexico)
		Satellite imagery and contaminant maps to further define and track spills	Synthetic aperture radar; oil and contaminant distributions throughout water column	
Offshore energy	Assess conditions for feasibility and cost effectiveness of energy generation; Compare alternative locations; Maximize efficiency and safety of energy operations; and Evaluate potential impact of energy facility on coastal processes, wildlife, and other ocean users for permit review	Climatologies—historical conditions	Historical wind at various elevations (especially hub height), wave and/or currents	Hindcast of historical winds via Regional scale ocean model (WRF) planned for Year 4;
		Nowcasts and forecasts	Near real-time winds, waves, currents	Nowcast/Forecast of waves, surface and subsurface currents (Regional ocean circulation model); Southeast US WRF Atmospheric model; Marine weather portal
		Predictions of impacts	Acoustics, wave fields, sediment transport, nutrients, habitats, wildlife distribution, migratory pathways, etc	GSAA Coast and Ocean Portal has some fish and marine mammal data.

***Primary Users and Stakeholder Agencies:** Ports operation personnel (pilots, commercial vessel operators, etc.), Fishermen, recreational public, coastal and offshore engineers, fisheries operations, federal, state, local and private agencies and academic institutions involved in marine operations (e.g. USCG, HAZMAT, DH etc.)

**** For the generation of number of products identified in this sheet, the underlying data sets and model output are similar**



USER ASSESSMENT: COASTAL HAZARDS THEME

9/26/14

Key topics	User Needs and Goals*	Key Products or Services Needs	Key Variables/Data Types Needed	Current SECOORA products/services**
Emergency Response and Preparedness	Timely and high resolution hazard and disaster information to coastal communities to protect public and infrastructure; Long-term planning for future responses, and Enhance public safety and use of beaches	Nowcasts and forecasts of extreme weather, high water, storm surges and erosion events, inundation and waves	Accurate shoreline maps, nearshore bathymetry, near real-time water level, waves, winds, barometric pressure, precipitation	Nowcast/Forecast of storm surge and inundation of storm surges for entire southeast run by UF and NCSU (funded); Several other member institutions also run storm surge and inundation models; Marine weather portal
		Climatologies and long-term forecasts of frequency and intensity of extreme weather, high water, storm surges, erosion events, inundation and waves	Historical data on above variables	Historical simulations of storm surges, waves and inundation for various storm tracks are run by member institutions
		Beach conditions alerts	Rip currents, waves, presence of jellyfish or HABs, water quality including bacteria indicators	Beach water quality modeling app for Myrtle beach location in SC. Work is in progress to transfer the same to a beach location in FL. Rip currents activity is planned for Year 4. Marine weather portal

***Primary Users and Stakeholder Agencies:** emergency responders, weather forecasters, recreational mariners, National weather service, national operational forecast centers, private and recreational sectors (eg. tourist and fishing charters etc.) fishers, surfers and public,

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USER NEEDS ASSESSMENT: ECOSYSTEMS, FISHERIES, WATER QUALITY 9/26/14

Key topics	User Needs and Goals*	Key Products or Services Needs	Key Variables/Data Types Needed	Current SECOORA products/services
Fisheries	Improved understanding, use, management and conservation of coastal and marine ecosystems. Restore and protect healthy ecosystems and sustainable fisheries, and the cultures and economies that depend on them.	(1) Integrated maps and displays linking environment variables to fisheries data	Habitats, fish and wildlife distributions/migrations, invasive species, dynamic physical/chemical variables (currents, temperature, nutrients), bathymetry, etc.	SECOORA data and maps Portal; Bio-Hab web site (with FWC/FWRI); GSAA web portal
		(2) Seasonal and annual climatologies	Historical physical and chemical variables (currents, temperature, nutrients, etc.) and biological responses (chlorophyll, zooplankton, fish, wildlife)	Climatology product involving the buoys, coastal stations and regional ocean circulation model is being developed. Ecosystem variables are also being added in Year 4 via regional ocean circulation model.
		(3) Coastal/Ocean currents modeling and virtual particle tracking for larval fish transport	Surface and subsurface currents	Surface currents via buoys and HF Radars; Nowcast/forecast regional ocean circulation model; Virtual particle tracking offered via NCSU web site
Water Quality: -Nonpoint and Point Source Pollution; -Harmful Algal Blooms -Hypoxia -Eutrophication	Predict and minimize impacts from discharges of pollutants. Improve management based on water quality conditions and trends, identifying and mitigating sources of pollution. Protect public health and aquaculture facilities from HAB impacts and preparing for wildlife rescue. Improve adaptation and mitigation of harmful impacts associated with low oxygen (hypoxia) and high nutrients (eutrophication)	(1) Early warnings of the presence/prediction of pollution events, including plume / particle tracking	Near real-time nutrients and fecal bacteria indicators, currents, water density, point source and stormwater inflows	Beach water quality modeling for a beach location in SC. Being transferred to a location in Florida
		(2) Portal for integration of regional water quality monitoring data (federal, state, academic and local), freshwater inputs, restoration efforts	Historical and current nutrient, pesticide, fecal bacteria concentrations, turbidity, salinity, temperature, currents, oxygen, point source and stormwater inflows, restoration program activities	
		(3) Maps showing spatial distribution of HABs and long-term patterns of occurrence. Early warnings to coastal managers and businesses when conditions are conducive to HAB formation and when HABs present	Historical HAB biotoxin concentrations, species distribution and abundance; Near real-time temperature, currents, chlorophyll, nutrients, HAB biotoxin concentrations, species distribution and abundance	
		(4) Maps showing spatial distributions and long-term patterns of hypoxia occurrence; Early warnings for when conditions are conducive to hypoxia and/or eutrophication	Historical oxygen, nutrients, chlorophyll; Near real-time temperature, salinity, water density, currents, oxygen, nutrients, chlorophyll	

*Primary Users and Stakeholder Agencies: researchers, scientists, managers, public health officials, commercial and recreational fishermen, federal, state, local and private agencies and academic institutions involved in fisheries and water quality monitoring, management, research and regulation

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USER NEEDS ASSESSMENT: CLIMATE VARIABILITY

9/26/14

Key topics	User Needs and Goals*	Key Products or Services Needs	Key Variables/Data Types Needed	Current SECOORA products/services**
Ocean Acidification	Long-term planning for mitigation and adaptation to respond to acidification and impacts on ocean life and fisheries; Effective and safe operation of facilities, e.g. shellfish aquaculture, planning / responses such as suspending, moving operations, changing timing of releases or harvest	Status and trends of acidification, including mapping of particularly sensitive habitats	pH, pCO ₂ , dissolved inorganic carbon, alkalinity, oxygen, temperature, salinity habitat distribution	Grays Reef Buoy pH and OA sensors (pCO ₂ , dissolved inorganic carbon, alkalinity)
		Warnings sent to interested parties when conditions unfavorable due to acidification	pH, pCO ₂ , dissolved inorganic carbon, alkalinity, oxygen, temperature, salinity, turbidity, chlorophyll, river discharges	
Sea level and Shoreline changes	Long-term planning to ensure safety and protection of coastal community and natural resources, evaluate proposed development or coastal protections	Long-term trends and forecasts of beach and shore erosion, sea level rise, land subsidence, and coastal flooding and inundation	Water level, waves and winds, precipitation and runoff, nearshore LiDAR/bathymetry, shoreline position	
Ecosystem conditions	Increased understanding of long-term changes in ocean/lake conditions and planning for mitigation and adaptation strategies	Climatologies and long-term forecasts	Historical physical, chemical, biological and geological variables (e.g. currents, temperature, oxygen, nutrients, chlorophyll, zooplankton, fish, wildlife, shoreline position)	Product in development to provide access and visualization of historical observed and modeled water temperature and salinity; Historical satellite data on Chlorophyll (MODIS) and SST are available for entire SE via member institutions
		Regional climate indices, e.g. primary productivity, ENSO, shelf-slope exchange, pCO ₂ , freshwater inputs, biological responses	Above variables, near-real time and historical	

***Primary Users and Stakeholder Agencies:** federal scientists, academic researchers, modelers, land use planners, climate and ecosystem scientists, flood plain managers and coastal planners, federal, state, local and private agencies and academic institutions

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User Needs Assessment - Resources and References

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