APNEP Scientific and Technical Advisory Committee

Pitt County Office Complex, Greenville, North Carolina
Spring Meeting Notes, April 29, 2009

Members Present: Richard Anderson, Reide Corbett, Robin Dennis, Tim Spruill, Wilson Laney, Kirk Havens, Ken Stolte, Robert Diaz, Richard Smith, Milo Pyne, Stan Riggs, Michael Rikard, David Mallinson, Rafe Sagarin, Don Field, Lauriston King, Jerry McMahon, Enrique Reyes.

Liaisons: Bill Swartley (NC-DENR-DFR), John Holley (NC-DENR-DLR).

Guests: Matthew Flint (USDA-NRCS), David Welch (Alion Science/Technology), Betsy Smith (EPA-ORD-NERL), Alex MacPherson (EPA-ORD-NERL).

Staff Present: Bill Crowell, Dean Carpenter, Jimmy Johnson, Lori Brinn, Chad Smith.

Call to Order: Wilson Laney: Wilson convened the meeting at 10:15 AM followed by introductions. He asked if anyone had any changes or corrections to the minutes from the STAC winter meeting. Minutes were approved by consensus with no changes.

APNEP Update: Dean Carpenter

- Dean Carpenter apologized for lunch not being served at today's meeting due to state expenditure restrictions. Dean expressed hope that such restrictions will end soon. Dean was also hesitant if today's meeting would even happen due to travel restrictions.
- The summer STAC meeting is scheduled for Wednesday, July 22 (same venue); the fall STAC meeting will soon be scheduled in late October/early November.
- Dean asked Wilson Laney to brief members about the ACFHP species-habitat matrix review held in Raleigh on February 19-20 (Dean and Wilson attended this Atlantic Coastal Fish Habitat Partnership Meeting).
- Dean mentioned that Bill Hunt has resigned from STAC, and that new members Richard Anderson and Bob Diaz were both attending their first meeting.
- Dean asked Bill Swartley to provide an overview of the NC Forest Assessment. Bill noted that USDA Forest Service has asked each state to assess their current forest resources, but also to define what the needs will be, and strategy, for 2010-2015. The process will be iterative, done again in 2015-2020.
- STAC Executive Board held their quarterly teleconference on March 2.
- Dean and other STAC members attended the Albemarle-Pamlico Conservation and Communities Collaborative (AP3C) meeting in Elizabeth City on March 17.
- In early April, Dean and APNEP Director Bill Crowell participated in the NC Sea-Level Rise Risk Management Study workshop along with STAC member Stan Riggs. The effort is being run by the NC Division of Emergency Management in collaboration with some contractors, to get input on their draft plan.
- The STAC Executive Board approved the sixth STAC Technical Issue Paper (coastal energy production and exploration), and Dean will be working with the APNEP Management Advisory Committee (MAC) to get more topics of interest from them, and provide more issue papers on the technical dimension of those.
- The next APNEP Policy Board Meeting is scheduled for Thursday, May 28, 2009. The meeting is taking place during the APNEP Implementation Team Review by EPA. The review is scheduled for May 27-29, 2009. Presence of the STAC Executive Board at the Policy Board

Meeting is favored.

- APNEP Community Specialist, Lori Brinn, briefed members on recent happenings with the APNEP Citizens Advisory Committee. The CAC has selected 5 projects to be funded for their schoolyard demonstration projects, one in Virginia and four in North Carolina. Lori also noted that APNEP has a new Facebook page and blog.
- Stan passed out three publications concerning sea level rise (NC Coast in Crisis). Reide Corbett said that all three can be downloaded from the NC Coastal Hazards web site. Stan noted these publications are not designed to be the answer, but rather just to let people know there is a science basis out there. They are designed to get discussions going and educate legislators and managers.
- Dean asked Stan to give a brief update on the North Carolina Legislative Commission on Global Climate Change. Stan said there are some bills in the legislature to renew the Climate Commission. The vast majority of the recommendations have something to do with energy, and only one says that we need to do something about adaptation along the coast. Someone terminated the climate commission before they were able to vote on which recommendations to pursue. There is a bill by State Representative, Pricey Harrison, which will redesign the Climate Commission, and he understands that may go forward.

US Department of Agriculture's Agricultural Science and Technology Programs and Activities: Matthew Flint **note: presentations can be found in their entirety on the STAC website in the "members only" section. "Rough outlines" only are provided in these notes.*

- Matt Flint noted that he wanted to give us a brief introduction to NRCS programs. He noted that much of their work is driven by the 2008 Farm Bill. He noted that it contains some new emphasis, one of which permits them to provide some technical assistance on forests. They also will be involved in developing markets for ecosystem services although they haven't figured out how they will handle it. Matt also noted that he would discuss several potential partnerships.
- Cooperative Conservation Partnership Initiative (CCPI) established to assist potential partners with focusing conservation assistance in defined project areas to achieve high priority natural resource conservation objectives. CCPI offers multi-year partnership agreements. This is not a grants program.
- NRCS will make Environmental Quality Incentives Program (EQIP) and Wildlife Habitat Incentives Program (WHIP) funds available to owners and operators of agricultural and non-industrial private forests land who will participate in CCPI projects. In North Carolina, approximately $1 million of EQIP and $65K of WHIP funds have been designated for use by new contracts originating from CCPI partnerships.
- Multistate and single state proposals will be accepted for FY 2009 funds until April 24, 2009.
- Eligible entities include: state government, local government, Indian tribes with federal recognition, Producer associations, Farmer Cooperatives, Institutions of Higher Education, and non-governmental organizations with history of cooperative work with producers.
- Conservation Innovation Grants (CIG) will stimulate the development and adoption of innovative conservation approaches and technologies. Applications are online. Match requirements are intact for CIG proposal grants.
- Terms of grants are 1-3 years. There are separate national and state-level opportunities. Organizations and individuals may submit proposals. Projects must be related to overall objectives of EQIP.
- 14 national proposals requesting a total of $9.4 million were submitted for projects in North Carolina.
- Matt gave examples from the NC Wildlife Resources Commission's CURE program. NRCS partnered with the NCWRC which developed the contracts, and NRCS provided the funding to implement the practices.

- Kirk Havens asked if there was still limited funding for monitoring? Matt noted that monitoring has been limited. He noted that funding for monitoring could be provided by partners.
- Lorry King asked if these programs are described online. Matt indicated that they are, and can be located by putting NC and the program abbreviation in your search engine.
- Matt provided examples of innovative practices supported by NRCS. This included using a small-grain cover crop to increase organic matter, an organic soil quality cropping system, establishment of a pollinator/beneficial insect habitat, a stream habitat improvement and management program, fish passage program, etc.

US Environmental Protection Agency's Coastal Carolinas Environmental Decision Toolkit Overview: Betsy Smith **note: presentation postponed because proposed CCMP goals and objectives required further refinement by APNEP staff.*

- Betsy Smith gave a brief overview of the EPA Coastal Carolinas Environmental Decision Toolkit. EPA's Ecological Research Program has been renamed Ecosystem Services Research Program (ESRP). Betsy noted they have done a toolkit before, which was driven by air toxics. She noted they have a large database for the southeast. They have taken that as a starting point. They also pulled in data from the national toolkit. They have data on people, air, water, terrestrial, and multiple categories. They worked closely with the USGS' GAP program in the Southeast to get those data. The toolkit provides both static and active mapping. In the early years, they looked at different integration methods, and developed new ones as well. The toolkit is for visualization and integration, and allows you to combine the spatial data in different ways. She gave some examples. One can view current status, and future projections. They try to provide perspective to different decision-makers. The tool can be used at the regional, local and watershed level.
- Web based toolkit, single variable views, multivariable views, relationships between variables, integration of indicator variables, and interoperability with other utilities.
- Descriptive Spatial data + Spatial model Output leads to forecast scenarios, which then leads to descriptive spatial data and spatial model output = toolkit.
- Betsy noted that STAC members can go online and use it and give her feedback. She showed some examples of how to do interactive maps. One can look at how a variable of interest is distributed across the landscape. It can produce linked micro maps, to see if there are spatial patterns. One can do data drill-downs. It will produce radar plots which show all variables at once: the longer the spoke for an individual variable, the more favorable its rating.
- Betsy showed an example of variable integrations. The map she showed was a simple sum of data, showing less versus more stressed watersheds.
- Select variable and add subjective values: water quality, air quality, human health, management priorities (BMP placement).
- Compare indices: two different assessments of water quality.
- Creating reference areas: three current methods currently available, existing watershed or ideal reference using available variables / measures the multivariable distance between a reference watershed's suite of variables and the same suite of variables for other watersheds (top five or all); sustainability or other goals can be used to define the reference: providing a report card on where individual watersheds stand; can be used to identify similar watersheds.
- Graphing the data is useful for exploratory analysis.
- Interoperability: "digital watershed" - access to spatial data, finer-scale management software.
- The CC-EDT is currently available. Betsy noted that they are looking for other data which investigators want to share. It provides universal access. It is a powerful statistical engine which integrates data "on the fly." Visualization allows data drilldown and assessment of spatial relationships, etc.

- Betsy reviewed the coming improvements. They will improve usability to address needs. They will mash-up the EDT with "ArcServe" for finer-scale analyses. They are reorganizing to reflect supply and demand of ecosystem service metrics. They will build in an ability to change directionality of variables for integration.
- Betsy said this has been available since Fall 2008 and that they are getting input from "air" people. Most of their input is coming from EPA Region IV. For "water" users, they are adding a lot of data to get it to the 12-digit HUC level. The water folks are going to look at it for use in mitigation. They also have versions for policy-makers, who want quick answers. There are also data users who will just go in to the system and play around with the data. The Charlotte group decided to put together a regional planning alliance, to do strategic planning and avoid future problems.
- Email: smith.betsy@epa.gov / Website: www.waratah.com/coastalcarolinas
  Guest Sign-in: Revaguest (username); Anonymous (password).

Forecasting Impacts of Sea Level Rise on A-P Marshes: David Welch
**note: presentations can be found in their entirety on the STAC website in the "members only" section. "Rough outlines" only are provided in these notes.*

- Research funding was provided by the Department of Defense Legacy Resource Management Program.
- Goals: sea level rise (SLR) predictions, modeling SLR impacts, model simulations on Dare County Peninsula, and Discussion (applying SLR rise models to predict impact of mitigation/restoration, and research needs).
- What will be the change in eustatic sea levels by 2100? David's work chose the A1B storyline, which presumes a maximum 0.7 m increase from 1990 levels, and a minimum of 0.13 m from 1990 levels. Recent research indicates that the oceans may rise more than a meter per century.
- David explained other ways of modeling SLR. Bathtub models raise the level of the ocean and see what land area floods. The SLAMM is an improvement over the bathtub models, because it puts other land covers in place. There is transition from a relatively dry wetland, to a salt or brackish marsh.
- SLAMM development began n 1986. It has gone through several iterations (1991 SLAMM2, 1993 SLAMM3, 1998 SLAMM4, etc.). David gave the model processes overview: it covers inundation, erosion, and accretion.
- Input Requirements: GIS Data (DEM: elevation and slope; National Wetland Inventory: wetland types and upland simplified into general land cover classes).
- There are three scenarios, which are the Good, the Bad, and the Ugly. David showed initial conditions, based on the NWI maps. Most of mainland Dare County is forested wetlands. A pretty dramatic shift in cover types occurs by 2020. A lot more salt marsh is evident. He included relative rise, which takes into account accretions. As SLR continues, more open water begins to appear. By 2100, there is a loss of about a third of the forested wetlands.
- For the Bad scenario, the 2020 map is similar. Things become very wet by 2040. By 2100 very little of the peninsula is left. By 2100, 87 percent of the forested wetland is gone; the "ugly" scenario shows much more rapid inundation.
- Further research includes looking at accretion in wetland ecosystems, and influence of drainage canals, and mitigation/restoration strategies.
- Swamp and Marsh Accretion: studies of marsh accretion on Dare County Peninsula; Swamp accretion under rising seas: SLAMM hardwires swamp accretion (0.3 mm/yr non-tidal, 1.1 mm/yr tidal).
- Canals and ditches: botanists have observed more salt tolerant species near canals on this peninsula; models run with and without canals.

- Drainage Canal System: Canals accelerate impacts of SLR in SLAMM runs; runs with 20-feet cell size do not represent canals which are typically 10-feet wide; tide gates (one way valve that allows freshwater to enter the estuary but not the other way around).
- Mitigation/Restoration Strategies: Prescribed fires and marsh productivity, establishment of salt-tolerant plant communities, marsh fertilization, and oyster shell reefs.
- The bottom line is that SLAMM is an important step in modeling the impacts from SLR. Better field data should improve model accuracy. SLAMM can contribute to SLR mitigation by modeling the impacts of these efforts.

US National Park Service's Science and Technology Programs and Activities: Michael Rikard
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- Michael Rikard noted the other federal land ownership agencies and how they differ from NPS. The NPS generally does not manage their habitat, in contrast to other federal agencies which may do so (waterfowl impoundments).
- Michael noted that his title is Chief of Natural and Cultural Resource Management. He has been there 20 years and has a staff of about 20 people.
- 27 different designations of US National Park Service units (e.g., National Parks, National Monuments, National Seashores).
- Monitoring for sea turtle nests has been their biggest monitoring activity; staff rides the beach every morning (Core Banks – 45 miles) 7 days a week monitoring. Lots of time and commitment; they do not monitor at night. Flag the areas where eggs are found.
- Most nests are loggerheads; some leatherbacks. Eggs average 115 in a nest; little over a month to hatch; laying in late May through the end of August; some nests are relocated (to avoid potential flooding areas).
- Eggs are excavated to see how many hatched.
- All data goes to the NCWRC; turtle strandings (dead) are required to be reported.
- Members asked about the late nineties spike in turtle activities. Possibly a cohort following TED implementations; Michael wasn't sure why there was a spike but that it was seen throughout Atlantic coast, not just Cape Lookout.
- Piping Plover eggs are hard to spot; blends in with the sand, which can be easily destroyed through mild disturbance (walkers, vehicles, and predators).
- Enclosures for piping plovers only protect the eggs, not the chicks. The chicks begin to move through the enclosure mesh.
- Data shows that the number of chicks fledged is lower than the number of nesting pairs. Improvement seen in 2004 through 2006; numbers have dwindled considerably in 2007 and 2008. Predation and heat may be contributing to the decline. Not sure to why the numbers have declined aside from the obvious predators.
- Michael reviewed the three populations of piping plovers. Michael noted that North Carolina is a transition zone for a number of species, including piping plovers. North Carolina is in the middle of the wintering range, and nesting range, so we have both nesting and wintering birds at Cape Lookout.
- The other listed species is seabeach amaranth. It is an annual, reproducing by seed, usually found on the front of dunes. They began monitoring in 1993. All the plants tend to be on south-facing beaches.
- Other species of concern include American Oystercatchers, which are solitary nesting birds. They live 15-30 years, and mate for life, or occasionally have a threesome. The chicks tend to spend a lot of time in the beach. When threatened, the chicks squat in the lowest point on the beach, so they tend to spend time in tire ruts, which other beach drivers usually follow. They

have documented at least three mortalities in tire ruts. Radio transmitters have been put on some of the birds. Their productivity has been low. Ghost crabs do get them, they get run over, and one transmitter was found in owl scat. Michael showed us oystercatcher reproductive success data. He noted that geolocating bands are now being tested and that they can last for 3-4 years. The bands are a lot cheaper than satellite transmitters. Numbers were pretty low, until Hurricane Isabel wiped out the raccoon population, after which time the hatching rate increased.

- Stranded marine mammals are required to be reported; most are bottlenose dolphins, harp seals, whales. Necropsies follow the report to identify cause of death.
- Raccoons are often removed to see how it affects the productivity of seabirds. This is a temporary solution since they come back.
- Horses on Shackleford Banks are an emotional and political issue. Congress has mandated a private group manage the horses. There are 120 or so horses on the banks. They have had a number of round-ups. The first was to remove diseased animals. The females are darted for birth control. He has a full-time biologist to manage the horse herd.
- Deals with both natural and cultural issues.

A-P Science and Technology Issues: Tim Spruill

- Tim Spruill, STAC Co-Chair, facilitated a discussion about science & technology topics raised by Committee members or other meeting participants.
- Wilson noted that Dean had electronically transmitted the reports provided by some members and liaisons to the membership. Due to the lack of time, the STAC decided not to discuss each report. Wilson asked if there were any questions about any of the items. There were none. Wilson noted that he had started his update, but hadn't completed it in time for distribution prior to the meeting. He will distribute it following the meeting.

The meeting concluded at 3:02 PM.