The Coastal Society

TCS Bulletin
Volume 35 (2) 2013

Save the Date for Summit 2014!

"Inspiring Action & Creating Resilience"
24th Biennial Meeting of The Coastal Society
&
Restore America's Estuaries 7th National Summit on Coastal & Estuarine Restoration
November 1- 6, 2014, Washington, DC
www.estuaries.org/summit

It's Complicated: Lake Okeechobee, the Everglades, Drought, Floods, Agriculture, People and a Tale of Two Estuaries

by Paul Gray

Florida's Lake Okeechobee made national news this summer as massive volumes of water were dumped from it to coastal estuaries to avoid excessively high water levels in the lake. The gush of fresh water overwhelmed the St. Lucie and Caloosahatchee Estuaries with nutrient-enriched fresh water, creating harmful algae blooms, causing organisms that can flee to do so and ones that cannot, such as oysters and sea grasses to suffer massive die-offs, leaving the estuaries as virtual dead zones. And now, after a summer of harmful estuary dumps, parts of the Everglades are too dry.

South Florida has one of the most complex water management systems in the world, designed in the 1940s, and called the Central and Southern Florida Project for Flood Control and Other Purposes (C&SF Project). It is a multi-purpose system, but built primarily in response to hurricane flooding. Notably, Okeechobee's 2.5 million-acre watershed--which starts near the Orlando International Airport--received a large net-

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TCS Makes a Splash at CERF 2013!

by Leigh Johnson

The Coastal Society was well represented at the Coastal and Estuarine Research Federation (CERF) conference in San Diego, California on November 3-7, 2013. The Society organized an exhibit, held a TCS reception, presented a plenary session and we were recognized as a sponsor in the Conference Program and at the Exhibit Hall.

Former TCS President Megan Bailiff organized the plenary session, "Sea Level Rise – New, Certain and Everywhere." Panelists included former TCS President and Duke University Marine Laboratory Director Mike Orbach, professor Gary Griggs of UC Santa Cruz and former UNH professor Randy Olson, who now writes books and produces feature films on communicating science to the public. The tempo was quick, with panelists rotating throughout the plenary, and the graphics were excellent! Randy Olson introduced his "ABT method" for creating a short and simple "elevator speech" about a scientific issue. To use ABT, you must make a statement about the issue, add a second statement to clarify or flesh out the first one (And), note a related problem (But) and give a call to action (Therefore). The plenary also highlighted a NOAA app with a "slider"

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Dear TCS Member:

I would like to share some highlights from 2013 as well as a look at some of our future plans.

2013 Highlights
Over the past year, The Coastal Society has made wonderful progress developing collaborations with other organizations, and in getting the word out about "who" the Society is and the issues in which we are engaged. Here are some highlights of what we are doing now and where we are going in coming years:

• In August, we were proud to announce our collaboration with Restore America's Estuaries for **Summit 2014- Inspiring Action, Creating Resilience**, which will also serve as the 24th Biennial Meeting of The Coastal Society (November 1-6, 2014, Washington, DC). Collaboration between the coastal practitioner and restoration communities is long overdue, and we are eager to convene this interdisciplinary forum. This will be a great opportunity for you to participate in sharing information, learn more about several important current issues, network with colleagues, and become even more closely involved with two leading coastal organizations. For more information: http://www.estuaries.org/summit.
• On November 5th, attendees of the Coastal and Estuarine Research Federation (CERF) took part in a uniquely structured symposium entitled **SEA LEVEL RISE: New, Certain and Everywhere**, a collaboration between The Coastal Society and CERF. You can read about it beginning on the front page of this issue.
• On November 18/19th, TCS members presented a panel discussion at the **North Carolina Beach, Inlet & Waterway Association** annual meeting in Wrightsville Beach. Panelists included Lisa Schiavinato (North Carolina Sea Grant), Larry Cahoon (UNC Wilmington) and Phil Prete (City of Wilmington), with Mark Imperial (UNC Wilmington) as moderator. They discussed the most recent scientific research on the effects of beach nourishment on beach organisms, the legal challenges known as "houses on the beach," and offered an overview of a just-completed vulnerability assessment conducted by the City of Wilmington on its water and sewer infrastructure.

Future Plans
• To increase The Coastal Society's involvement in policy discussion in Washington, DC, and to strengthen our relationship with coastal managers, we are enthusiastic about discussions for a series of possible **roundtable briefing sessions** with the Coastal States Organization, located just steps away from Capitol Hill.
• Recognizing the critical importance of social science in the coastal field, TCS Board members are actively serving on the planning committees for the **NOAA Social Coast Forum**, to be held in Charleston, SC in February 2014.
• Building on past leadership and career sessions offered to Coastal Society members, we are exploring potential pilot seminars with a nationally-recognized training program, which includes a handful of TCS members as alumni.
• Continuing our legacy of student-to-professional coordination, we also welcomed a new TCS Chapter at the **University of North Carolina-Wilmington**, and are in active discussions with other interested universities and geographic areas.
• Finally, we have worked to improve and modernize the way we communicate with all of you. Our Communications Committee has **expanded our Twitter and Facebook presence**, and additional changes are in the works for the coming years to create more compelling and easier ways for TCS members to connect.

Your contribution is vital to help The Coastal Society further these plans and reach larger audiences. Please consider your place in TCS' efforts and how you can participate in our future. Your help will go a long way in helping us to reach our goals, and to provide you even greater opportunities to participate in our Society. I also want to thank those of you who have offered in-kind volunteer support over the past year. Donations to TCS may be made to https://donatenow.networkforgood.org/TheCoastalSociety.

Best wishes for a happy new year!

Kate Killerlain Morrison
TCS President

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for policy makers to see predicted inundation of coastal areas with 1-6 feet of sea level rise. Try it at http://www.climate.gov/news-features/decision-makers-toolbox/viewing-sea-level-rise

Former TCS Board of Directors member Leigh Johnson organized the TCS elements for an exhibit shared with Restore America's Estuaries, a prelude to TCS 24, which will be an integrated meeting with RAE's 7th National Summit in November 2014. Elsa Carlisle of RAE, who staffed their part of the exhibit, is also a TCS member. Johnson created a poster to attract visitors to the TCS materials and provided the TCS Membership Benefits brochure, list of student chapters, copies of the Bulletin and Coastal Management Journal flyer at the exhibit booth. Carlisle helped to get the word out about TCS activities at the conference.

Leigh Johnson

Mike Orbach, Randy Olson and Gary Griggs presented the lively TCS Sea Level Rise Plenary at the CERF 2013 conference.

Johnson also organized a TCS reception during the CERF conference. Former TCS President Mike Orbach, TCS Board of Directors member and President-elect Gerhard Kuska and other TCS and Coastal Zone Canada members enjoyed networking. Two Knauss fellows and an Alaska Geological Survey staffer attended, learned about TCS and the benefits of membership, and expressed interest in joining TCS!

Leigh Taylor Johnson is the Coastal Resources Advisor for University of California Cooperative Extension, based in San Diego. She conducts applied research and community education on water quality and invasive species issues affecting coastal and inland waters. Leigh has belonged to TCS since 1992 and has served on the Board and several conference planning committees, as conference Proceedings Editor, and as track and plenary chairs. ltjohnson@ucanr.edu

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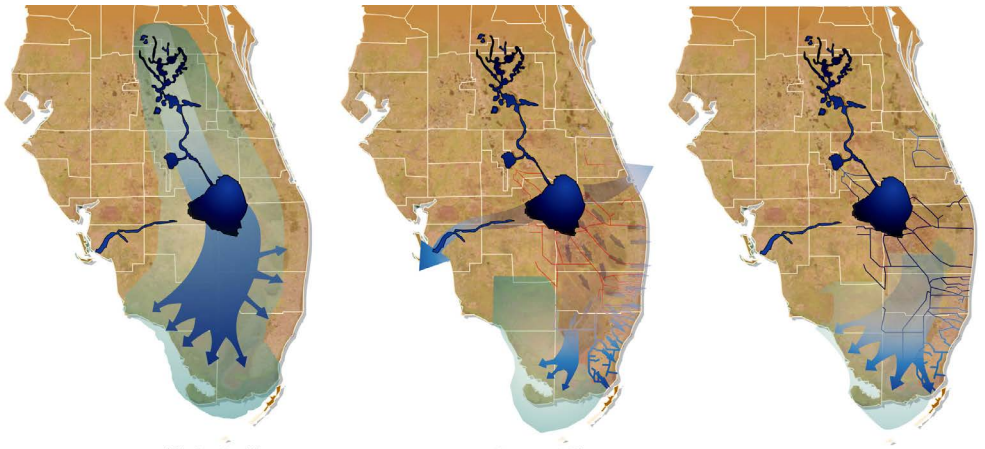
work of major canals to drain the watershed more quickly to the lake. Once there, excess water no longer drains southward into the Everglades, but rather is diverted west into the Caloosahatchee Estuary, which formerly received limited lake flows, and east to the St. Lucie River, which formerly received no lake flows. The C&SF Project design drains Florida very well during wet periods, but creates many undesirable effects.

Lake Okeechobee

Efficient drainage from the C&SF fills Lake Okeechobee so rapidly during wet periods that it can threaten the integrity of the Hoover Dike. The dike is an earthen embankment, not designed with an impermeable core to hold water like a dam, yet is used to keep lake water out of the Everglades Agricultural Area, whose elevation is lower than the lake. The Hoover Dike also completely encircles the lake; no water can exit the lake except through water control structures.



Historically, all the water from the Kissimmee Valley flowed through Lake Okeechobee to the Everglades but the C&SF project diverted the flows east and west, creating water shortages for the Everglades and too much flow for the coastal estuaries. Everglades restoration is designed to return flow to the Everglades and away from coastal estuaries (map courtesy of the US Army Corps of Engineers).

The ideal ecological range for lake levels is considered between 12 to 15.5 feet NGVD (i.e., National Geodetic Vertical Datum, comparable to feet above sea level in 1929) but when lake levels reach 18 feet, the chance of leaks capable of breaching the dike is estimated at about 40%. The US Army Corps of Engineers (Corps) has found and patched such leaks in the past. Considering that by July 2013 the lake had risen above 15 feet, and that the lake has previously risen three to six feet after tropical storms, the Corps simply had no choice but to lower the lake as quickly as possible. Large releases to estuaries ensued.

Lake Okeechobee also suffers from anthropogenic phosphorus enrichment, receiving approximately four times as much phosphorus inflow each year as the goal. High phosphorus inflows and a phosphorus-enriched mud bottom sustain phosphorus concentrations in the lake between 100-200 parts per billion (ppb). The Lake's goal is 40 ppb based on research documenting that concentrations above 50 increase the occurrence of harmful algae blooms, such as are now seen in coastal estuaries during Lake releases.

Chronically-elevated phosphorus levels also create a significant hurdle for returning Lake water to the Everglades. To comply with the Everglades Forever Act and two federal court cases, water entering the Everglades must meet a 10 ppb phosphorus standard. The agencies have built some 65,000 acres of "Stormwater Treatment Areas" (artificial marshes that retain phosphorus as water flows through them) that have yet to attain the standard. Adding significantly greater amounts of high-nutrient water from the Lake will increase compliance challenges proportionally.

The Everglades

The Everglades proper started at the southern rim of Lake Okeechobee and sloped from about 20 feet NGVD at the lake, one-hundred miles southward to Florida Bay. Before modifications, virtually all Okeechobee outflows ran to the Everglades. The C&SF engineers realized that draining the lake would be more efficient via shorter canals to the east and west coasts, and installed virtually all outflow capacity to the St. Lucie and Caloosahatchee Estuaries. Today, the Everglades receive very little lake water due to reduced capacity to it, and due to the Lake's water quality problems. The Everglades now suffers chronic water shortages.

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The St. Lucie and Caloosahatchee Estuaries

The St. Lucie River formerly had a small watershed, separate from the lake. Once it was connected to Lake Okeechobee by the St. Lucie Canal, its watershed area increased at least 6 fold. Lake releases combined with local runoff can turn the estuary almost completely fresh for months on end. The plume of nutrient enriched water is noticeable in the ocean for miles and settles on offshore reefs, with poorly-understood impacts.

Similarly, the Caloosahatchee Estuary formerly received some Okeechobee outflows, but it too is now turned too fresh for long periods. Ironically, during Florida's long winter dry season, the Caloosahatchee needs flows from Okeechobee to prevent excess salinities, but must compete with water supply interests around the Lake who lobby to cut estuary flows to zero, to save the water for themselves.

Water Supply for Humans

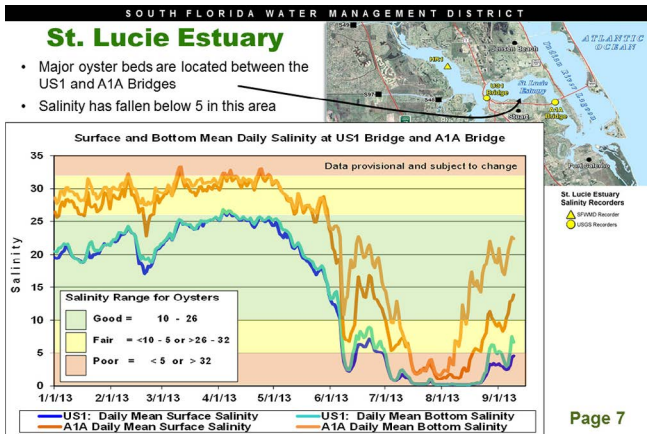
At nearly a half million acres, Lake Okeechobee is a major source of water supply, particularly to the farms in the 700,000 acre Everglades Agricultural Area. To maximize supply, the Lake must be kept at the highest level possible at any given time. But this goal conflicts with the lake's flood control role, where lower levels create more storage capacity for storms. Plus, higher levels trigger increased concern for dike safety, and less freeboard before lake-lowering estuary dumps begin. The drainage system upstream of the lake creates more rapid rises during wet periods, but also creates more rapid water level drops during dry periods, due to reduced base flow from the drained watershed. With Florida's 7-8 month dry season from October to June, rapid drops in Okeechobee levels often create water rationing.

Constant Water Management Conflicts

The C&SF project was designed more than 60 years ago by a society with different goals, values, and population size. Ingenious for its time, it emphasized drainage but also included "Water Conservation Areas" for dry periods. Yet an engineer signing off on it at the time warned that if the drainage components were overused, it would intensify drought impacts.

Jacqui Thurlow-Lippish

The dark plume of Okeechobee water moves southward along the Atlantic Coast 15 miles south of the St. Lucie Inlet.



Salinities plunged to poor conditions in the St. Lucie Estuary and remained there for months. (Source: Ecological Conditions Report, South Florida Water Management District Governing Board meeting, Sept. 12, 2013)

This has happened.

As early as November this year, Water Conservation Area 3 (WCA3), north of Everglades National Park was lower than desired. If the outfall structures were closed, it might keep enough water in WCA3 for a good dry season pattern. But closing the gates would prematurely dry out the Park. Lake Okeechobee does not have enough water to re-hydrate both systems, and water quality problems in the lake are a further hindrance to moving water south.

This result comes after dumping millions of acre feet of water during the summer. WCA3 and the Park also recharge the Biscayne Aquifer, water supply to millions, and premature dry-outs are a concern. Similarly, farmers and Caloosahatchee interests are already disagreeing on whether water should stay in the lake for water supply or be released to enhance the estuary's salinity management needs.

Everglades Restoration Projects to the Rescue—We Hope

The constant conflicts between flood control, water supply, and natural system needs have created an interesting partnership. With between 50-70 inches of rain annually, Florida gets plenty enough water to

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meet its needs. But we waste it, harmfully, to tide. A key need is to find ways to capture water beneficially during wet periods, which can help prevent harmful gushes to estuaries and natural systems, retain water for dry period needs, and allow time to cleanse the water that will be sent to natural systems. The Comprehensive Everglades Restoration Plan, CERP, passed by Congress in 2000 is intended to do that. It is supported by diverse groups, from environmental, to agricultural, to public utilities and local governments, who all realized an upgrade to south Florida's C&SF system could benefit them. But political and economic problems have delayed it.

The next major step is the Central Everglades Planning Project that state and federal parties are trying to get to Congress now. The price is near two billion dollars, it will take two decades to build if things go right, and it is only a partial solution to catching, cleaning and moving water in the most beneficial ways. In the present political climate, it's increasingly difficult to gain approval of, and sustain interest in projects of this nature. Yet, if south Florida's water management system is not rebuilt, today's problems will only worsen as the population continues to grow. More people in the landscape means that room for major water projects will shrink.

Storms and droughts increase public and political interest in water resource issues but past trends show a loss of attention once the problems subside. Sustaining funding and interest in large, long-term projects remains a challenge.

Paul N. Gray, Ph.D., has been with Audubon Florida for 19 years and is a science coordinator for their Everglades Restoration Program. He serves primarily as technical support for Audubon's policy staff, specializing in Lake Okeechobee issues. His academic background is in ecology but he spends much time on hydrology, nutrient dynamics, urban and agricultural Best Management Practices, and politics. pgray@audubon.org

TCS Supports Students: RARGOM Testimonials

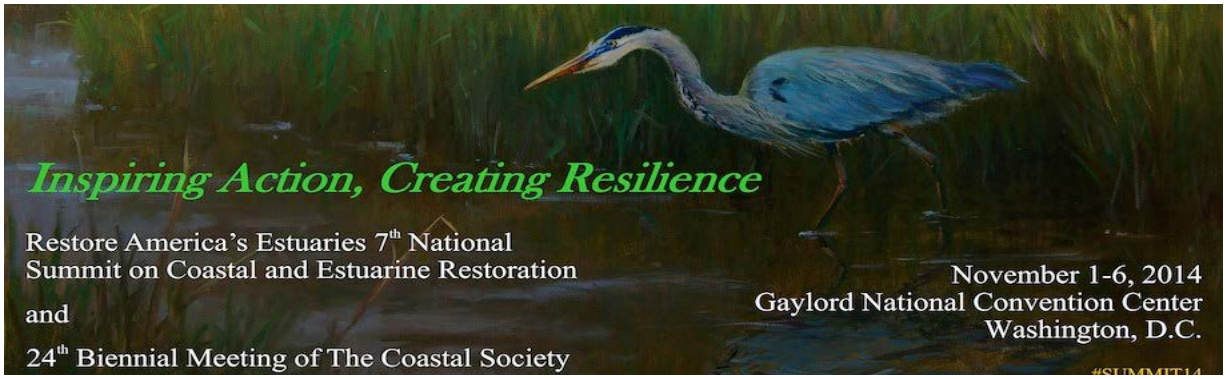
TCS Board member Susan Farady (Director, Marine Affairs Institute/Rhode Island Sea Grant Legal Program; Roger Williams University School of Law) facilitated the attendance of two students to the Annual Science Meeting of the Regional Association for Research on the Gulf of Maine (RARGOM) www.rargom.org. Here's what they had to say:

"I'm Laura Whitefleet-Smith, a graduate student in the Masters of Marine Sciences Program at the University of New England. I attended RARGOM to present a poster on my ongoing research about species identification of hake fishes in the Gulf of Maine. This conference gave me the opportunity to not only present my research but also benefit from talking with a number of different researchers. Meeting these researchers has broadened my perspective on the potential impacts and applications of my research and allowed me to make new connections. I am very grateful that The Coastal Society generously chose to support me in attending this conference!"

"My name is Kaitlyn Cox, and I am a third year law student at Roger Williams University (RWU) School of Law. I came to RWU specifically to study marine affairs. In my time at RWU, I have had the opportunity to take many marine and maritime courses on a variety of subjects. Also, this semester, I started attending the University of Rhode Island under the joint-degree Masters in Marine Affairs program with RWU Law. Attending conferences such as RARGOM helps me to tie in the real world application of science to all of the courses and readings I have had for the past two years. In class, we read the case law and legislation, but rarely do we have the opportunity to dive into the science that helps to shape the various issues being decided. I thoroughly enjoyed the RARGOM conference. Many issues that I have been studying in class were presented. Specifically, I thought it was interesting that many of the scientists somewhere in their presentation, some subtly and some not, pointed to what they felt should be done on the policy end of the spectrum to benefit or ward off the very phenomena to which they had devoted their time and experience. Overall, I feel I gained much knowledge and perspective by attending RARGOM. Thank you for the opportunity to attend such an informative conference."

TCS Panel at NOAA's Social Coast Forum 2014

TCS members Chris Ellis, NOAA's Coastal Services Center and Susannah Sheldon, SC Sea Grant have developed a TCS panel for the 2014 Social Coast Forum, "Pushing the Social Science Agenda." Panelists will discuss ensuring that social science information needs across sectors are met and identified, enhancing the application of social science to decisionmaking, and facilitating communication and collaboration between natural and social scientists, managers, and agencies. The Forum will be held on February 18-20, 2014 in Charleston, SC. The inaugural Social Coast Forum in 2012 was a standing-room-only event, so be sure to register soon!



Call for Proposals:
Dedicated Sessions, Presentations, and Posters

Submittal deadline: February 28, 2014

ABOUT THE SUMMIT

Restore America's Estuaries (RAE) and The Coastal Society (TCS) are proud to announce a new collaboration to present the first ever Summit that will bring together the coastal restoration and management communities for an integrated discussion to explore issues, solutions and lessons learned in their work. The Summit will provide timely and much-needed attention to the challenges and opportunities for coastal and estuarine restoration and management and will bring together a unique blend of people who are involved in policy, science, strategy, business, and on-the-ground restoration and management. For more on the Summit, please visit http://www.estuaries.org/summit.

SUMMIT THEME: Inspiring Action, Creating Resilience

Coastal communities are increasingly faced with challenging decisions as a result of a host of factors including population changes, coastal development, pollution, climate change, invasive species, economic pressures, and many more. It is critical that the restoration and management realms not only respond effectively but also with a comprehensive approach to policy, planning and action. The overarching Summit theme, "Inspiring Action, Creating Resilience," will explore the many ways in which restoration and management can shape communities and vice versa, identify how to effectively measure and convey these changes and how people and communities can take meaningful action such that they can plan, respond and prosper in the face of challenges. For the Summit, the concept of resilience is interpreted broadly and encompasses the myriad of ways that natural and built environments, economies, cultures and societies can respond to impacts such that they not only persevere but thrive.

ABOUT THE PROGRAM

For the first time, the Summit Program will address all aspects of coastal and estuarine restoration and management, in all habitats, at all scales, and all regions, including the Great Lakes and international locales. These topics are crucial now as coastal communities pursue new, more robust strategies to effectively manage, protect and restore their resources. Coastal restoration and management go hand-in-hand by providing services and benefits via natural and built environments. They are pivotal for creating a pathway for sustainable job creation and economic growth, both of which are particularly critical to the nation at this time.

CALL FOR PROPOSALS

The Program Committee invites you to submit a proposal to present at the Summit. The Program emphasizes lessons learned and best practices in every aspect of coastal and estuarine restoration and management. To read and download the full document, please click here. All proposals are due February 28, 2014.

SPECIAL STUDENT INCENTIVES

Students are encouraged to participate! All students taking part in the program will be entered into the student poster or student presentation contests, for which prizes will be awarded. Please note that students qualify for special discount rates. Limited numbers of scholarships will also be available.

GREAT SPONSORSHIP AND EXHIBITING OPPORTUNITIES

Please see the Prospectus for details.

RESTORE AMERICA'S ESTUARIES

Ocean Acidification Could Make Fish Anxious

Ocean acidification, caused by rising levels of carbon dioxide in the atmosphere being absorbed into the sea, has caused many to worry about the problems it will likely create, such as a decline in shellfish and coral reefs. But humans may not be alone in their anxiety: Ocean acidification threatens to make fish more anxious as well. A new study found that after being placed for a week in an aquarium with acidic seawater--as acidic as the oceans are expected to be on average in a century's time--juvenile rockfish spent more time in a darkened corner, a hallmark of fish anxiety, and the same behavior exhibited by fish given an anxiety-inducing drug. After researchers placed the acid-stressed fish back into unaltered seawater, the animals showed continued signs of anxiety for more than a week, before finally returning to normal on the 12th day, the researchers reported. Several other studies have shown that acidified seawater causes changes in sensory input, sensory processing and possibly cognitive abilities in several species of fish. It's hard to know how big of a concern anxious fish pose, but if fish experience more anxiety due to ocean acidification, it certainly won't help them. Laboratory tests have shown that several species of Australian fish stressed by acidity were less likely to survive when returned to the ocean. Acidic waters in turn acidify the fish's blood. This creates a cascade of changes that interfere with activity of gamma-aminobutyric acid type A (GABA-A) receptors in the fish's brain, which are important for many functions, including behavior. The same receptors also play a role in anxiety in humans, and other animals. http://m.livescience.com/41765-ocean-acidification-anxious-fish.html

Wikimedia Commons

Rockfish

Huge Underestimate of Number of Households Rendered Uninsurable by Repeated Flooding

Great Britain has apparently failed to take climate change into consideration in estimating the number of households rendered uninsurable by repeated flooding. The oversight became apparent as thousands of people prepared to spend another night away from their homes after the worst tidal surge in more than 60 years. The storms sweeping across northern Europe cannot be directly attributed to climate change. However, scientists agree that global warming will increase the frequency and intensity of floods as a result of rising sea levels and an increasing number of storms. Government ministers recently agreed to a deal with insurers that would protect 500,000 households in areas now deemed to be at such high risk that their owners are unable to get coverage. The £180m raised each year is supposed to ensure that properties remain insurable through a £10.50-a-year levy on all residential premiums due to be introduced in 2015. But an impact assessment published by the government last week admits that its numbers don't consider any rise in flooding as a result of climate change – despite a separate piece of government research estimating that 800,000 residential properties could be exposed to a significant risk of coastal or river flooding by the 2020s."The analysis of the baseline scenario assumes that flood risk remains the same over time," said last week's impact assessment, adding that it does not "take account of changing flood risk due to deterioration of existing flood defenses, climate change or development in flood-risk areas." http://www.independent.co.uk/news/uk/politics/uk-extreme-weather-government-in-perfect-storm-over-climate-change-gaffe-as-floods-render-homes-uninsurable-8989643.html

Wikimedia Commons

Harbor Porpoise

Harbor Porpoises Return to San Francisco Bay after 60 Year Absence

To the delight of animal lovers and cetacean researchers, harbor porpoises and bottlenose dolphins have found new habitats in San Francisco Bay and are now regularly seen foraging for fish and body-surfing in boat wakes under the Golden Gate Bridge. Harbor porpoises, among the smallest of the world's six porpoise species, first re-appeared in 2008, after a more than 60-year absence. The appearance of the bottlenose dolphins in 2010, in contrast, is believed to be associated with a range expansion of the species. Prior to the 1982-83 El Niño, the dolphins were rarely found north of Point Conception, according to scientists. The photographic database is making it possible to address critical questions about the porpoise's life history, such as whether females give birth yearly, as do their counterparts on the East Coast, or every other year, as has been suggested by others. Besides studying the cetaceans'

many fascinating behaviors, scientists also hope to figure out what exactly attracted the top predators to the region. The leading theory is food. Low rainfall in 2007-09 might have expanded salt-water habitats in the bay for schooling fish such as herring. Dolphins have also been observed snacking on Chinook salmon in the bay. http://caseagrantnews.org/2013/11/04/porpoises-and-dolphins-in-san-francisco-bay-oh-my/?utm_source=Shoreline+Newsletter+-+November+2013&utm_campaign=Shoreline+Newsletter+November+2013&utm_medium=email

Swinomish Tribe: From Proclamation to Action

On the southeastern peninsula of Fidalgo Island in Washington State, the Swinomish were the first tribal nation to pass a Climate Change proclamation, in 2007. Since then they have implemented a concrete action plan. The catalyst came in 2006, when a strong storm surge pushed tides several feet above normal, flooding and damaging reservation property. Heightening awareness of climate change in general, it became the tribe's impetus for determining appropriate responses. The tribe began a two-year project in 2008, issued an impact report in 2009 and an action plan in 2010, said project coordinator and senior planner Ed Knight. They identified a number of proposed "next step" implementation projects, several of them now under way: coastal protection measures, code changes, community health assessment and wildfire protection, among others. The tribe won funding through the U.S. Department of Health & Human Services and the Administration for Native Americans to support the $400,000 Swinomish Climate Change Initiative, of which the tribe funded 20 percent. When work began in 2008, most estimates for sea level rise by the end of the century were in the range of one to one-and-a-half feet, with temperature changes ranging from three to five degrees Fahrenheit, said Knight. But those estimates did not take into account major melting in the Arctic, Antarctica and Greenland, he said. "Now, the latest reports reflect accelerated rates" of sea level rise and temperature increases, Knight said. Those are three to four feet or more, and six to nine degrees Fahrenheit, respectively, by 2100. "We are currently passing 400 ppm of CO2, on track for [Intergovernmental Panel on Climate Change] worst-case scenarios." http://indiancountrytodaymedianetwork.com/2013/10/15/8-tribes-are-way-ahead-climate-adaptation-curve-151763

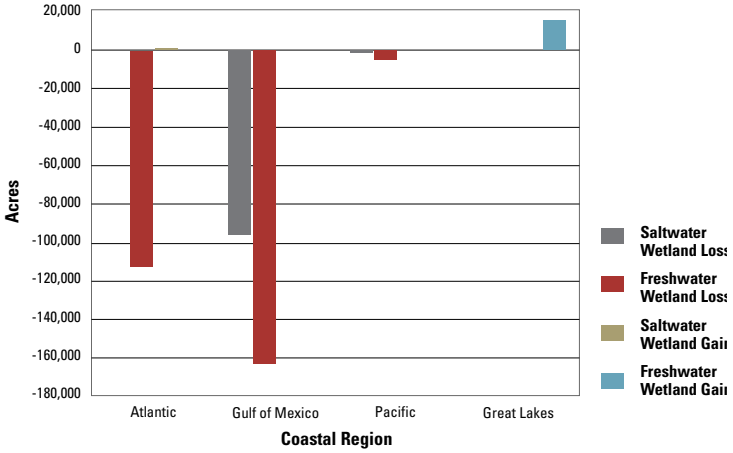
Status and Trends of Wetlands in the Coastal Watersheds of the Conterminous United States 2004 to 2009

Released on November 21, 2013 by the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration, this study tracked wetland changes in the coastal watersheds of the Pacific, Atlantic, and Gulf of Mexico as well as the Great Lakes. It concludes that more than 80,000 acres of coastal wetlands are being lost on average each year—the equivalent of losing 7 football fields an hour of wetlands--up from 60,000 acres lost per year during the previous study (1998-2004).

In some coastal watersheds, rising ocean levels are encroaching into wetlands from the seaward side, while development from the landward side prevents wetlands from being able to migrate inland. This dual threat squeezes wetlands into an ever smaller and more fragile coastal fringe.

In 2009, there were an estimated 41.1 million acres of wetlands in coastal watersheds; during the study period, both saltwater and freshwater wetlands were lost. Freshwater, forested wetlands were lost at the highest rate, although there was also an increase in the loss of estuarine wetlands, most likely due to the severe storms of 2004 and 2005. Development and some activities related to tree farming were responsible for the majority of the freshwater wetland losses

To read the full report, please visit www.habitat.noaa.gov/coastalwetlandsreport or www.fws.gov/wetlands/



DUKE UNIVERSITY

On a sunny mid-September morning, racers and volunteers alike showed up to participate in the 13th Annual Neuse RIVERKEEPER Sprint Triathlon, organized by the Duke TCS Chapter. This year's event was a great success, attracting 68 racers and nearly the same number of volunteers, and raising $1500 for the Foundation.


Maria Klushina

Duke Chapter Triathlon

Just as the tide went slack, a blast of the air horn signaled the beginning of the first heat and racers began their swim away from the Duke Marine Lab and towards Radio Island. Guided by Foundation volunteers, swimmers arrived at the beach and began the biking portion. The six-mile bike course led racers into and around historic Beaufort before taking them back to the Marine Lab on Pivers Island. The last segment of the race consisted of a two and a half mile loop to Radio Island and then back to the finish on Pivers Island.

After the final participant crossed the finish line, racers and volunteers enjoyed lunch while the times were tabulated. Prizes were awarded for both competitive and recreational classes for male and female individuals and teams. Participants with the craziest costume and most environmentally friendly gear also received prizes. All were donated by businesses located in Beaufort, Morehead City, Atlantic Beach, and Durham. The event ran smoothly with the help of the Beaufort Police, the Town of Beaufort, the US Coast Guard, the North Carolina Department of Transportation, and the Duke Marine Lab.


Emily Scott

URI Chapter Clean-up

EAST CAROLINA UNIVERSITY (ECU)

The grill was fired up and the courtyard was buzzing as the ECU student chapter hosted a cook-out to commence the semester. Professors and students chatted about adventures and vacations over the summer, and discussed plans to collaborate on research projects. There were many familiar faces, but also some new ones as well. The six new students to the Coastal Resource Management PhD program decided to join the student chapter and were eager to get involved. Members Coley Hughes and MIchelle Covi presented at the Coastal and Estuarine Research Federation (CERF) meeting in San Diego in November. The ECU chapter sold T-shirts designed by chapter chair Jennifer Jones and member Andrea Dell'Apa received a Knauss fellowship, beginning after the New Year.

Members enjoyed some merriment at Peasant's Pub for our holiday party as students recapped classes and discussed upcoming events. ECU student chapter members plan to participate with members from the UNCW and Duke chapters at the SciREN (Scientific Research and Education Network) workshop in February to develop marine and environmental science lesson plans with K-12 teachers. Chapter members also plan to attend the Social Coast Forum in Charleston, SC, catching up with TCS members there as well.

UNIVERSITY OF RHODE ISLAND

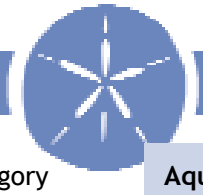
This quarter, the Marine Affairs Department was lucky to have a large entering class made up of one year, two year, and joint law program students! At the helm of the chapter this year are second year student Emily Scott and PhD student Alanna Casey, who warmly welcomed everyone to the department.

So far this fall, the group has cleaned up the beach at Bass Rock, a spot adopted by the URI chapter a few years back, collecting 10 full bags of trash! Several members had the opportunity to hear Sylvia Earle speak at nearby Roger Williams University. Her talk was very inspiring, as members tackle coastal and marine issues locally, nationally, and globally through our studies, theses, internships, and future careers. In late September, students attended the New Bedford Working Waterfront Festival, and were able to talk to fishermen, the National Marine Fisheries Service, Gulf of Maine Research Institute, and other great organizations. They also toured fishing vessels, listened to some local music, and watched the tugboat races!

Along with some informal get-togethers and happy hours, the chapter is proud to have designed the first Marine Affairs logo for the department, and is excited to be printing it on shirts and sweatshirts!

UNIVERSITY OF NORTH CAROLINA AT WILMINGTON (UNCW), *Newest TCS Student Chapter!*

In the fall of 2012, several TCS members in Wilmington, NC began meeting with students at UNCW to plot a new



TCS Student Chapter. These members include Dr. Gregory Meyer and Devon Eulie, Environmental Studies Department faculty, Dr. Larry Cahoon of the Biology and Marine Biology Department, and Dr. Mark Imperial of the Public and International Affairs Department. Students included Brittany Pace and Steven Autry, Environmental Studies graduate students, Paula Reidhaar from Marine Science, and Caitlin Reed Forde-Smith from Public Administration. Brittany Pace worked over several months to establish the student chapter and to get approvals. In the spring of 2013, the chapter was officially launched.

Lisa Schiavinato, TCS past president and Law, Policy and Community Development Specialist at North Carolina Sea Grant was the chapter's first speaker, with an audience of about 40 students and faculty. She spoke about North Carolina coastal law and policy. In March, Bonnie Monteleone, from UNCW's Chemistry Department spoke about marine debris and her involvement in the Plastic Ocean Project. Michelle Covi, a PhD student and TCS member from East Carolina University (ECU) spoke to the group in April 2013 about the North Carolina Coastal Atlas project.

The UNCW chapter has been active in the community, partnering with local environmental organizations. The biggest highlight from the first semester was the Oyster Reef Restoration Project organized by the North Carolina Coastal Federation. Many members of the chapter joined in this event at Oak Island.

Kallie Brown

UNCW Chapter Recruiting

At the beginning of the fall semester, chapter officers participated in outreach at the UNCW "involvement carnival," and as a result our first meeting with Dr. Larry Cahoon had over 70 people in attendance. In October, Sean Ahlum came to speak about Ocean Friendly Gardens, and in November, Lindsay Addison, Audubon Coastal Biologist, presented on nesting bird sanctuaries. Some volunteer events included Beach Sweep with the Surfrider Foundation, Big Sweep with Keep New Hanover County Beautiful, and "Paint the Porch," assisting the North Carolina Coastal Federation with their new Regional Office. This first year of establishment has been rewarding both to UNCW and to the local community and we look forward to many years of involvement! For more information on the UNCW chapter, please visit us at https://www.facebook.com/UNCWCoastalSociety and don't forget to click "like!"

Aquaculture America 2014
February 9-12, 2014, Seattle, WA
https://www.was.org/meetings

Social Coast Forum 2014
February 18-20, 2014, Charleston, SC
www.csc.noaa.gov/socialcoastforum/

2014 Ocean Sciences Meeting
February 23-28, 2014, Honolulu, HI
aslo.org/meetings/aslomeetings.html

World Ocean Summit 2014
February 24-26, 2014, San Francisco, CA
www.economistinsights.com/sustainability-resources/event/world-ocean-summit-2014

Indian Ocean Futures Conference 2014
March 25-28, 2014, Fremantle, Australia
www.iofc2014.com/

Ecological Basis of Risk Analysis for Marine Ecosystems
June 2-4, Porvoo, Finland
www.ices-ecoknows.eu/

Coastal Zone Canada 2014: Revitalizing ICOM in Canada - Sustaining Commitment and Momentum
Jun 15-19, 2014, Halifax, Nova Scotia, Canada
www.czca-azcc.org/html/conferences/main.html

34th International Conference on Coastal Engineering
June 15-20, 2014, Seoul, Korea
icce2014.com/main/

2nd International Conference on Oceanography
July 21-23, 2014, Las Vegas, NV
www.oceanographyconference.com/

Conference on Ecological and Ecosystem Restoration
July 28-August 1, 2014, New Orleans, LA
Deadline for submitting abstracts, January 10, 2014
conference.ifas.ufl.edu/CEER2014/links.html

Summit 2014: Inspiring Action, Creating Resilience
November 1-5, 2014, Washington, DC
Proposals due February 28, 2014
www.estuaries.org/summit

2nd International Ocean Research Conference: One Planet, One Ocean
November 17-21, 2014, Barcelona, Spain
www.imber.info/index.php/Meetings/

TCS Board of Directors News

We are pleased to announce the results of our fall elections: Mo Lynch will be taking over as TCS Treasurer and our newest Board members are Tom Bigford and Matt Nixon.

Maurice "Mo" Lynch was a charter member of The Coastal Society and served as President, President-Elect, Treasurer and Director between 1981 and 2006. He received the Outstanding Service Award in 2010. He also served as the editor or co-editor of TCS Conference proceedings for the 8th, 9th, 10th, 13th and 16th biennial conferences. Currently a Professor Emeritus at the Virginia Institute of Marine Science, College of William and Mary in Virginia, Mo served as an instructor and mentor for over 30 years. He was a Sea Grant Director, Director of Chesapeake Research Consortium and manager of the Chesapeake Bay NERR in Virginia during his long career. During this time he published or edited more than 60 papers, reports or proceedings dealing with coastal and estuarine management, research and education; marine protected areas; information management; and/or physiology of marine invertebrates. Mo currently serves on a gubernatorial appointed commission for the Hampton Roads Sanitation District, is a Tidewater Resources Conservation and Development Council Member and a Commissioner for the Middle Peninsula Planning District.

Tom Bigford is Chief of the Habitat Protection Division in NOAA Fisheries Service headquarters in Silver Spring, Maryland. He directs marine, coastal, and riverine programs related to: essential fish habitat; fish passage at hydropower and water diversion projects; coastal wetland policy; environmental permitting and licensing reviews; habitat policy and science; and deep-and shallow-water corals. He has 38 years of experience in research, management, and program direction including 3 years at an EPA research lab, 2 years consulting, and 33 years with NOAA field and headquarters offices. He has also held leadership positions with The Coastal Society (Secretary 3 years, Executive Director 3 years, Bulletin editor 17 years, conference chair for TCS12, proceedings editor twice, Membership Committee chair twice, received TCS President's Award 1990 and service award in 1994, best student paper award named in his honor in 1990s) and the American Fisheries Society (two terms as chair of Resource Policy Committee, President-elect of Fish Habitat Section, past member of Governing Board, columnist for Fisheries journal, twice received AFS Distinguished Service Award). Other memberships include Land Conservancy of West Michigan, Pere Marquette Watershed Council (MI), The Potomac Conservancy (MD, VA, WVA, and DC), Friends of Sligo Creek (MD), and Coastal and Estuarine Research Federation. He has a B.Sc. in Fishery Biology from Michigan State University (1974), a M.Sc. in Zoology/Marine Ecology from the University of Rhode Island (1976), and a Masters in Marine Affairs from the University of Rhode Island (1977).

Matt Nixon has been involved in The Coastal Society (TCS) since 2006 when he joined and later served as Co-President of the University of Rhode Island student chapter. In this capacity, he helped to complete the adoption of a right-of-way by the chapter in Narragansett, RI and coordinated numerous chapter events geared towards fostering an appreciation for the coastal and marine environments, both natural and cultural. Matt is currently the Assistant Program Manager for the Maine Coastal Zone Management Program. He coordinates various technical assistance grant programs that help Maine's municipalities plan for shore conservation, smart harbor management and development, and working waterfront conservation. He is also the Program's primary lead for ocean planning activities, with a significant focus on bathymetric mapping/habitat classification in the Gulf of Maine, biological and anthropogenic data collection, ocean energy planning, and land conservation. Since joining Maine CZM, he has focused on developing effective relationships with many of the state's universities, colleges, and non-profits to identify shared priorities and opportunities for collaboration and reduced duplication.

Matt received an M.A. in Marine Affairs from the University of Rhode Island, where his work focused on coastal recreational access and environmental justice. He also has an M.A. in Public Policy and Management from the University of Southern Maine, Muskie School for Public Service.

NC Coastal Federatopm

UNCW Chapter and others restoring an oyster reef

Board of Directors

The Coastal Society
Tax ID Number: 52-1082650
www.thecoastalsociety.org

OFFICERS

Kate Killerlain Morrison
(President)
Sargasso Sea Alliance Initiative
PH: (703) 300-4380
E-MAIL: kkmorrison1@gmail.com

Gerhard Kuska, PhD. (President-Elect)
Mid-Atlantic Regional Association Coastal Ocean Observing System (MARACOOS)
PH: (302) 831-7553
E-MAIL: kuska@maracoos.org

Lisa C. Schiavinato (Past President)
N.C. Sea Grant
PH: (919) 515-1895
E-MAIL:
lisa_schiavinato@ncsu.edu

Jeff Smith (Treasurer)
National Marine Fisheries Service
PH: (301) 713-4300 x.137
E-MAIL: Jeff.P.Smith@noaa.gov
(Finance Committee Chair)

Susannah Sheldon (Secretary)
Program Manager
SC Sea Grant Consortium
287 Meeting Street
Charleston, SC 29401
Ph: (843) 953-2078
E-Mail: Susannah.sheldon@scseagrant.org

DIRECTORS

Andy Bohlander
University of Hawai'i Sea Grant College Program
PH: (808) 587-0321
E-MAIL: andrewbo@hawaii.edu

Rick DeVoe
S.C. SeaGrant Consortium
PH: (843) 953-2078
E-MAIL: rick.devoe@scseagrant.org

Chris Ellis
NOAA Coastal Services Center
PH: (843) 740-1195
E-MAIL: chris.ellis@noaa.gov

Susan E. Farady
Roger Williams University School of Law
PH: (401) 254-4613
E-MAIL: sfarady@rwu.edu

Tony MacDonald
Urban Coast Institute at Monmouth University
PH: (732) 263-5392
E-MAIL: amacdona@monmouth.edu

Chad Nelsen
Surfrider Foundation
PH: (949) 492-8170
E-MAIL: cnelsen@surfrider.org

Rebekah Padgett
Washington State Department of Ecology
PH: (425) 649-7129
E-MAIL: rpad461@ecy.wa.gov

Brian Smith
NC State University Research Development Office
Ph:919-513-1331 (office)
843-754-8314 (cell)
E-Mail: bmsmith9@ncsu.edu

STUDENT CHAPTERS

Duke University University
http://www.nicholas.duke.edu/people/students/tcs/index.htm
President: Peter Zaykoski
E-MAIL:peter.zaykoski@duke.edu

East Carolina University
http://www.ecu.edu/org/tcs/
President: Jennifer Jones
E-MAIL: jonesje08@students.ecu.edu

Stanford University
President: Cassandra Brooks
E-MAIL: cassandrabrooks222@gmail.com

University of Delaware
Currently inactive

University of Rhode Island
President: Alanna Cassey
E-Mail: alannacasey@my.uri.edu

University of North Carolina, Wilmington
President: Britany Pace
E-MAIL: bap8412@uncw.edu

University of Washington
http://students.washington.edu/tcsuw/
President: Rachel Aronson
E-MAIL: raronson@uw.edu

PROFESSIONAL SERVICES

TCS Office
Judy Tucker, CAE, Executive Director
P.O. Box 3590
Williamsburg, VA 23187-3590
PH: (757) 565-0999
FAX: (757) 565-0299
E-MAIL: coastalsoc@aol.com

Bulletin Editor
Ellen Gordon
PH: (301) 407-9155
E-MAIL: ellen@gordonballard.com

Bulletin Designer and Publisher
East Carolina University
Institute for Coastal Science and Policy
PH: (252) 737-4263
E-MAIL: Loomisd@ecu.edu
David Loomis and Michelle Covi

Tax Preparation
Sean Rogstad
Dixon, Hughes, Goodman, LLP
PH: (703) 226-0088
E-MAIL: sean.rogstad@dhgllp.com

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Dues are for the calendar year, and mid-year payments are not pro-rated.
Make check payable to The Coastal Society, and mail it with your application to: PO Box 3590, Williamsburg, VA 23185. To pay by credit card, please use the online application at: www.thecoastalsociety.org/membership_signup.cgi