



**TCS23 Our Coasts, Our Heritage:
Ecosystem Services for the Common Good**
June 3-6, 2012 in Miami, FL
Registration Now Open, Early Bird Registration until May 18
Special Student Discounts
<http://www.thecoastalsociety.org/conference/tcs23/index.html>

Oceans and Coasts at Rio+20

By *Biliana Cicin-Sain and Joe Appiott*

Oceans are the quintessential sustainable development issue, critical to all three pillars of sustainable development—economic development, social development, and environmental protection. Oceans perform vital life-sustaining functions for the planet—oceans generate half of the oxygen on Earth, are a vital source of sustenance and livelihood, absorb carbon dioxide, and regulate climate. Ocean and coastal areas present excellent opportunities for development, which can yield significant economic and social benefits for coastal populations while protecting environmental integrity.

The UNCED and WSSD Goals Related to Oceans and Coasts

The United Nations Conference on Environment and Development (UNCED), also called the “Earth Summit” was convened in Rio de Janeiro, Brazil in 1992, and brought together virtually all nations of the world (178 countries) and 114 heads of state. The Earth Summit advanced the paradigm of sustainable development and put forth the following outcomes: 1) the Rio Declaration of Principles, 2) The Framework Convention on Climate Change, 3) The Convention on Biological Diversity, 4) Agenda 21—a detailed blueprint for sustainable development, and 5) a set of forest principles.

Chapter 17 of Agenda 21 (the oceans chapter)

The End of Overfishing

This year is the 35th anniversary of the *Magnuson-Stevens Fishery Conservation and Management Act*. Referred to simply as, “the Magnuson Act,” this law, with its regional framework and goal of sustainability has proven to be a game-changer in natural resource management. Because of the Magnuson Act, the United States is on track to end overfishing in federally-managed fisheries, rebuild stocks, and ensure conservation and sustainable use of our ocean resources. Fisheries harvested in the US are scientifically monitored, regionally managed and legally enforced under 10 national standards of sustainability. This anniversary year marks a critical turning point in the Act’s history. In time for the 2012 fishing season, all 528 federally-managed fish stocks and complexes should have annual catch limit and accountability measures in place.

The history of the Magnuson Act parallels the history of environmental stewardship in the United States and the progress made in conservation over the last three decades. The Magnuson Act was ushered in during the era of environmental consciousness that still defines the nation’s stewardship ethic today. Signed into law on April 13, 1976, the Magnuson Act followed passage of other laws dedicated to addressing the environmental damage incurred after decades of unfettered industrialization. These laws include

INSIDE

Message from the President.....2

TCS23.....3

NewsNotes.....8

Special Issue of CMJ.....11

Upcoming Conferences.....12

Chapter Updates.....13

Stanford Shark Week.....14

Board of Directors.....16



Dear TCS Members,

Happy Spring! Wherever you are, I hope you're able to enjoy the fresh air and watch the blooming trees and flowers and listen to the birds sing.

Although we announced the results of our annual election in December, I still would like to take the time in this letter to wish a fond farewell to our outgoing Board members and welcome our new ones. I sincerely thank Angela Gustavson, Christine Patrick and Betsi Beem for their service to the TCS Board of Directors. Their solid input and lively personalities will be missed. I wish them the best. Please join me in extending a warm welcome to our new Board members: Andrew Bohlander, Susan Farady and Tony MacDonald. I'm glad they have joined the TCS Board and look forward to working more closely with them.

TCS23 will be here before we know it. The conference will be held in Miami from June 3-6. In this issue of the *Bulletin*, we have included some details, found on page 3. Registration will open very soon, and the conference Preliminary Program will be released at that time as well. Thank you to the TCS23 Organizing Committee for their dedication and efforts. It's all coming together, and we have our solid group of committee members to thank for that. It's going to be a fantastic conference! From interactive plenary sessions to a dynamic technical program and an assortment of student events, I'm excited to share more with you about what's in store for TCS 23.

I hope you enjoy this issue of the *TCS Bulletin*. As usual, it includes thoughtful, informative articles. I thank those that took the time to write them. I also thank Editor Ellen Gordon for her commitment to our newsletter and Sarah Young for her work on the layout and design.

Regards,

Lisa Schiavinato

Lisa Schiavinato
TCS President



The views expressed herein are those of the authors and do not necessarily represent TCS nor its Board.



The Coastal Society's 23rd International Conference Our Coasts, Our Heritage: Ecosystem Services for the Common Good

June 3-6, 2011, Hyatt Regency Miami

Please join us for The Coastal Society's 23rd International Conference (TCS 23), "Our Coasts, Our Heritage: Ecosystem Services for the Common Good." TCS 23 will focus on innovative ideas to address coastal issues by providing information, knowledge, activities and solutions relevant to solving contemporary coastal issues; integrating science, management, policy and decision making; and presenting questions, ideas and case studies that encourage dialogue and sharing of solutions among conference participants.

Discover Solutions

The Coastal Society's biennial conference is one of the longest-running series of coastal conferences in the United States. TCS conferences provide a forum for interdisciplinary education and discussion on coastal issues. Speakers debate the different facets of issues during plenary sessions to create an awareness of needs among coastal resource managers and users, which ultimately lead to opportunities for innovative solutions. During concurrent sessions, ocean and coastal professionals share their latest research and strategies, sparking new ideas. The TCS conference is the place to listen, discuss, ask questions, and think about the application of knowledge for the future of our coasts.

Connect with Professionals

Hundreds of participants are expected to attend the TCS 23 conference in 2012, including policy makers and decision makers, state and federal ocean and coastal resource managers, local planners, academics from various disciplines, business and industry representatives, coastal engineers, consultants, teachers and graduate students. Coastal connections which transcend geographic boundaries and professional disciplines are made at these conferences and often continue post-conference, enriching the information on which decisions about coastal resources are made.

The Coastal Society is an organization of private sector, academic and government professionals and students. The Society is dedicated to actively addressing emerging coastal issues by fostering dialogue, forging partnerships, and promoting communication and education.

Two Plenary Sessions!

The opening plenary on Monday, June 4 will review, "40 Years of the Coastal Zone Management Act: Impacts and Innovations." The closing plenary on Wednesday, June 6 will focus on, "A Global Trend Toward Larger Ships: A Debate Regarding the Benefits and Impacts to Port Regions."

Marc J. Hershman Keynote Speaker

William "Bill" M. Eichbaum, Vice President for Marine and Arctic Policy at the World Wildlife Fund (WWF) US, has accepted the invitation to be the keynote speaker. In the 1970s, Bill helped organize the first Earth Day. In the 1980s, he played a key role in the creation of the Chesapeake Bay Program. Before joining WWF in 1989, Bill served as the Massachusetts Undersecretary of Environmental Affairs--one of many positions held during his twenty years of public service. While working on environmental affairs for the state of Maryland, Bill spearheaded legislation for the Clean Water Act authorizing the creation of a national estuary restoration program. His experiences trying to restore the Chesapeake Bay ultimately led him to WWF. Now, as WWF's advocate for the sea, he is working to end destructive fishing practices, reduce pollution and establish a network of effectively managed, ecologically representative marine protected areas covering at least 10% of the world's seas. Bill was a long-time chair of the TCS International Committee.

Five Concurrent Sessions Every Day

Three days of concurrent sessions will present the latest research and tools regarding ocean and coastal issues and provide opportunities to discuss innovative solutions that can be undertaken by local communities, states, regions and industries.

- o Defining and Measuring Ecosystem Services in the Context of Ecosystem Based Management
- o Planning for Emerging Coastal Issues and Threats
- o Valuing Coastal Goods and Services
- o A Social Approach to Examining our Coasts
- o Ecosystem Services in the Real World-Policy and Management Trends



continued from page 1

stresses the importance of oceans in the global life support system and the opportunities for sustainable development that ocean and coastal areas represent. It emphasizes the need for new approaches that “are integrated in content and anticipatory in ambit” and addresses key issue-areas, including integrated coastal management, sustainable fisheries, protection of the marine environment, and strengthening of multilateral cooperation.

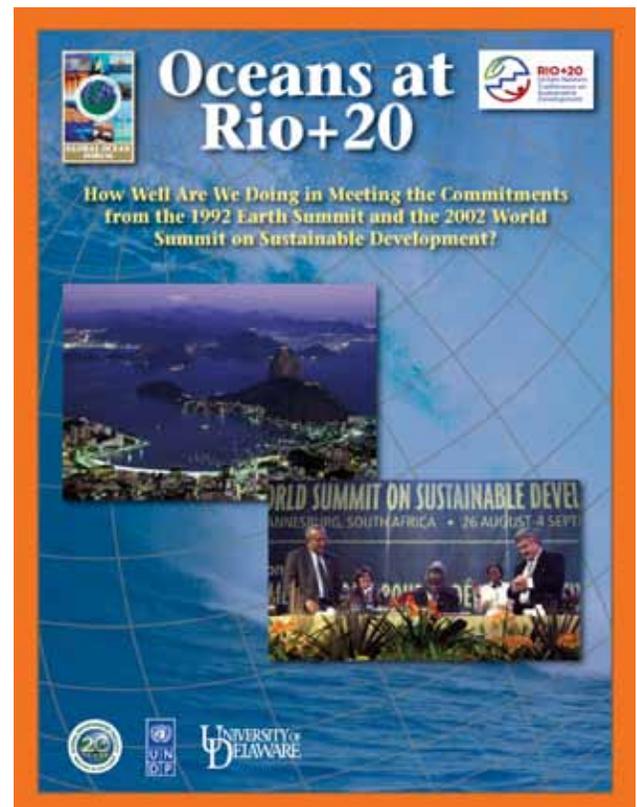
Ten years later in 2002, the World Summit on Sustainable Development (WSSD) was convened in Johannesburg and featured a ten-year review of UNCED to reinvigorate global commitment to sustainable development. The outcome of the WSSD, the Johannesburg Plan of Implementation (JPol), was designed as a framework for action to implement UNCED commitments. The JPol includes provisions for poverty eradication; consumption and production; the natural resource base; small island developing States (SIDS); and the institutional framework.

Regarding ocean and coastal issues, the JPol emphasized issues related to the ecosystem approach and integrated management; protection of the marine environment from land-based activities; integrated water resource management; biodiversity and marine protected areas, SIDS; fisheries and aquaculture; global marine assessment; coordination of UN activities on oceans; oceans financing; and capacity development.

The Rio+20 Conference—Moving into a New Phase of Sustainable Development

In 2010, the United Nations (UN) General Assembly called for the convening of a conference to address progress made on major commitments, and new and emerging challenges related to sustainable development. The UN Conference on Sustainable Development (also called the Rio+20 Conference or UNCED) will take place in Brazil on June 20-22, 2012 to mark the 20th anniversary of the 1992 Earth Summit.

The new vision of sustainable development embodied in the 1992 Earth Summit, i.e., UNCED, represented a major paradigm shift that changed the world. In 2002, the WSSD took the paradigm shift further by committing to specific targets and timetables to achieve some of the commitments made at the Earth Summit, through the Johannesburg Plan of Implementation. Twenty years after the Earth Summit, we must take advantage of Rio+20 to assess what we have achieved (and not achieved) and craft the way to a new future where we can all live and prosper in a low-carbon global economy in health and harmony with nature.



Oceans, Coasts, and SIDS in the Rio+20 Process

Issues related to oceans, coasts, and small island developing States (SIDS) have featured prominently in the Rio+20 preparatory process, with governments and major groups highlighting issues related to sustainable fisheries, integrated coastal management, and improved UN coordination. Oceans featured prominently in the formal submissions to the Rio+20 negotiating document, with more than 2/3 of governments and all political groups addressing issues related to oceans, coasts, and SIDS.

The Global Ocean Forum has been active in the Rio+20 process, convening multistakeholder dialogues among groups of countries and undertaking policy analyses of progress made since UNCED and the WSSD (List of Global Ocean Forum’s Rio+20 Activities available at: <http://www.globaloceans.org/sites/udel.edu.globaloceans/files/GOF-RIO20-activities.pdf>).

The Global Ocean Forum, with support from the Global Environment Facility and the UN Development Programme, and with contributions from many experts around the world, has prepared a report on Oceans at Rio+20: How Well Are We Doing in Meeting Global

continued on page 5



continued from page 4

Commitments on Oceans, Coasts, and Islands from the 1992 Earth Summit and the 2002 World Summit on Sustainable Development? (Summary for Decision Makers available at: <http://www.globaloceans.org/content/rio20>). This report addresses the question of “How well are we doing?” in the implementation of the UNCED and WSSD commitments related to oceans, coasts, and SIDS and provides “report cards” on the achievement of the UNCED/WSSD goals related to oceans, coasts, and small islands in the following areas; (1) Ecosystem-based, integrated coastal and ocean management; (2) Protection of the marine environment from land-based activities, and integrated water resources management; (3) Biodiversity and marine protected areas; (4) SIDS; (5) Sustainable fisheries and aquaculture; (6) Addressing critical uncertainties for the management of the marine environment; (7) Coordination of UN activities on oceans; (8) A Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socio-economic Aspects; and (9) Capacity development.

Priorities at Rio+20

The genius of Chapter 17 of Agenda 21 was the realization that we can no longer manage the oceans as we traditionally have, i.e., sector-by-sector. Instead, we must implement, as Agenda 21 put it, approaches that are “integrated in content, and precautionary and anticipatory in ambit.” Since 1992, we have built the infrastructure for integrated ecosystem-based governance.

A major challenge in the next phase is to further enhance the implementation of integrated oceans policy at both national and regional levels, consider appropriate applications in areas beyond national jurisdiction, and consider how integrated governance could also be applied to the United Nations system to achieve greater effectiveness and coherence. Here are our major priorities for an “oceans package” at Rio+20:

Integrated, Ecosystem-based Ocean and Coastal Governance at National and Regional Levels

Given the nature of the added challenges that we are facing in oceans, coasts and SIDS, it is imperative that we scale up integrated, ecosystem-based ocean and coastal management efforts, and significantly enhance our investments in these initiatives. This should include:

- Scaling up integrated oceans governance to all countries and regions

around the world;

- Promoting sustainable ocean and coastal livelihoods, “blue” green job creation, public private partnerships, and local-level and community-based management; and
- Encouraging application of Ecosystem Based Management/Integrated Coastal Management (EBM/ICM) by management bodies at the regional level, such as Regional Fishery Management Organizations, and other regional resource management arrangements.

Oceans and Climate Change

Many in the global oceans community are promoting the development of a comprehensive program related to oceans and coasts, both inside and outside the United Nations Framework Convention on Climate Change (UNFCCC), emphasizing:

- Adoption of urgent and stringent reductions in greenhouse gas emissions;
- Positive contribution that oceans can play in mitigation of global warming, such as natural carbon sinks in coastal areas, and ocean-based renewable energy;
- Ecosystem-based adaptation strategies implemented through integrated coastal and ocean management institutions at national, regional, and local levels to build the preparedness, resilience, and adaptive capacities of coastal communities; and
- Technical and financial assistance to SIDS and developing countries to build institutional capacity to implement adaptation, early warning systems, and disaster risk reduction.



continued on page 6



continued from page 5

Sustainable Fisheries

There is a need to accelerate multi-pronged efforts to arrest the continuing decline of global fish stocks, while meeting the sustenance and livelihood needs of a growing population, including through:

- Ratification and implementation of global instruments (e.g., UN Fish Stocks Agreement, UN Food and Agriculture Organization Code of Conduct for Fisheries, UN General Assembly resolutions for addressing deep-sea fish stocks);
- Strengthening and, where appropriate, creating new Regional Fisheries Management Organizations; and
- National strategies and action plans to address illegal, unreported, and unregulated (IUU) fishing and reduce fishing overcapacity.

Biodiversity and Marine Protected Areas (MPAs)

Major goals extending from the WSSD calling for the reduction in global biodiversity loss by 2010 and the establishment of networks of marine protected areas (MPAs) by 2012 have not been met. To achieve these goals in the next phase and ensure conservation and sustainable use of marine biodiversity, the Rio+20 Conference should call for:

- Accelerating the establishment of MPA networks in the context of EBM/ICM and marine spatial planning, with emphasis on climate change resilience; and
- Creating, and improving the capacity of institutional mechanisms for creating and managing MPAs.

Capacity Building and Financing

There is a clear need for capacity building and financing to enable integrated oceans governance and appropriate responses to major threats. Sufficient financing is needed for developing countries and SIDS to advance sustainable ocean governance, especially in the face of climate change. At least half of the adaptation funds should be devoted to coastal and island communities, home to one-half of the world population.

Integrated Oceans Governance at the UN

We need enhanced and decisive UN mechanisms for dealing with the new level of risk, especially in relation to climate change, and to realize the opportunities that lie ahead. Just as many countries have done at the national level, we must embrace the vision of the whole, and institute integrated oceans governance at the UN, rather than relying on the incremental actions of a myriad of specialized agencies, each with different missions.

Oceans must be elevated to the highest levels of the UN to enable a cross-cutting approach and appropriate and timely response to major threats and opportunities. Focused at-

attention at the highest political levels is needed, including through the potential creation of a UN Secretary-General or other high-level coordination mechanism on oceans.

A Sense of Urgency

We must look at Rio+20 as an important opportunity and conduct our work with a great sense of urgency. A changing climate and continuing loss of biodiversity represent a powerfully negative combination that threatens our human well-being and planetary survival. The need to create and act upon a new vision of a low-carbon economy and a new "blue society," where people act as stewards of our oceans and coasts is a compelling imperative. The time to act is now, not tomorrow.

¹ UNGA A/RES/64/236

Dr. Biliana Cicin-Sain (PhD in political science, UCLA, postdoctoral training, Harvard University) is Director of the Gerard J. Mangone Center for Marine Policy and Professor of Marine Policy at the University of Delaware's College of Earth, Ocean, and Environment. An expert in the field of integrated coastal and ocean governance, she has forged international collaboration among all sectors of the international oceans community to advance the global oceans agenda, especially as founder and president of the Global Ocean Forum and has been recognized through numerous distinguished ocean and coastal awards.

Mr. Joe Appiott (M.S. in Marine Policy) is a policy researcher at the Global Ocean Forum and doctoral candidate at the Gerard J. Mangone Center for Marine Policy at the University of Delaware's College of Earth, Ocean, and Environment. Joe has a background in marine biology, and his work focuses largely on international ocean and coastal policy, participating in UN negotiations and coordinating international multi-stakeholder dialogues. Joe's doctoral research focuses on the ongoing intergovernmental debates on marine biodiversity in areas beyond national jurisdiction with a view towards identifying elements of resolution to these contentious global debates.



Coastal Management The Official Journal of The Coastal Society

Be Sure to Use Your Members' Link to Read the Articles in this Special Issue
National Oceans Policymaking: Practices and Lessons

Successful Transplantation of a Fragmenting Coral, Montipora digitata, for Reef Rehabilitation
By Edgardo D. Gomez, Helen T. Yap, Patrick C. Cabaitan & Romeo M. Dizon

Integrated Oceans Policymaking: An Ongoing Process or a Forgotten Concept?
By Nien-Tsu Alfred Hu

Australian Oceans Policymaking
By Martin Tsamenyi & Richard Kenchington

Canada's Oceans Policy Framework: An Overview
By Ted L. McDorman & Aldo Chircop

China's Ocean Policymaking: Practice and Lessons
By Keyuan Zou

Integrated Maritime Policy of the European Union: Challenges, Successes, and Lessons to Learn
By Timo Koivurova

Japan's Ocean Policymaking
By Hiroshi Terashima

Korea's Oceans Policymaking: Toward Integrated Ocean Management
By Dong-Oh Cho

Taiwan's Oceans Policymaking: Its Development and Assessment
By Nien-Tsu Alfred Hu

Recent Developments at the Federal Level in Ocean Policymaking in the United States
By David Fluharty

Incorporating Fisheries Interests in National Oceans Policymaking
By Warwick Gullett



Whitetip reef shark (*Triaenodon obesus*) at Mariana Islands, Guam.
Photo credit: NOAA



Entire Nation of Kiribati to be Relocated over Rising Sea Level Threat

In what could be the world's first climate-induced migration of modern times, Anote Tong, the Kiribati president, said he was in talks with Fiji's military government to buy up to 5,000 acres of freehold land on which his countrymen could be housed. Some of Kiribati's 32 pancake-flat coral atolls, which straddle the equator over 1,350,000 square miles of ocean, are already disappearing beneath the waves. Most of its 113,000 people are crammed on to



NASA astronaut image of eastern part of Non-outi Atoll, Glibert Islands, Kiribati.
Photo credit: NASA

Tarawa, the administrative center, a chain of islets which curve in a horseshoe shape around a lagoon.

"This is the last resort, there's no way out of this one,"

Mr. Tong said. "Our people will have to move as the tides have reached our homes and villages." Excerpted from <http://www.telegraph.co.uk/news/worldnews/australiaandthepacific/kiribati/9127576/Entire-nation-of-Kiribati-to-be-relocated-over-rising-sea-level-threat.html>

World Bank Issues SOS for Oceans

A coalition of governments, international organizations and other groups have joined forces with the World Bank to confront threats to the health of the planet's oceans. Launching the Global Partnership for Oceans, Robert Zoellick, the president of the World Bank said marine life was threatened by over-fishing, loss of habitat and environmental degradation. "Send out the S-O-S: We need to Save Our Seas," said Zoellick, speaking at the World Oceans Summit in Singapore. "The world's oceans are in danger, and the enormity of the challenge is bigger than one country or organization. We need coordinated global action to restore our oceans to health. Together we'll build on the excellent work already being done to address the threats to oceans, identify workable solutions, and scale them up." The Bank hopes to raise \$1.5 billion in the next 5 years to protect oceans. About 85

per cent of ocean fisheries are fully exploited, over-exploited or depleted, including most of the stocks of the top 10 species, according to Zoellick. Excerpted from <http://www.aljazeera.com/news/asia-pacific/2012/02/201222495059695127.html>

Alien Species Invading Antarctica via Tourists, Scientists

A new study suggests that Antarctic tourists and scientists may be inadvertently seeding the icy continent with invasive species. Foreign plants such as annual bluegrass are establishing themselves on Antarctica, whose status as the coldest and driest continent had long made it one of the most pristine environments on Earth. But a boom in tourism and research activities to the Antarctic Peninsula may be threatening the continent's unique ecosystems, scientists say. For the study, ecologist Steven Chown at the University of Stellenbosch in South Africa and colleagues vacuumed the clothes, footwear, bags, and gear of approximately 2 percent of people who visited during the Antarctic summer from late 2007 to early 2008. That amounted to 853 scientists, tourists, and accompanying support workers and ships' crew members. The results revealed more than 2,600 seeds and other detachable plant structures, or propagules, had hitched a ride to Antarctica on these visitors. Disturbingly, the scientists said, 49 to 61 percent of the foreign plant material that reaches Antarctica are cold-adapted species that can withstand and colonize in extreme conditions. The plants likely get stuck to cold-weather gear that travelers had used in other frigid climes prior to arriving to Antarctica. Excerpted from <http://news.nationalgeographic.com/news/2012/03/120305-antarctica-invasive-species-environment-science-tourists/>

Whales, Wildlife Top List of Remaining Wind Farm Concerns

As the federal government presses ahead with plans to develop wind farms on a 1,300-square-mile plot of ocean south of Martha's Vineyard, representatives from the federal Bureau of Ocean Energy Management (BOEM), accompanied by members of the Gov. Deval Patrick administration and Cape and Islands Rep. Timothy Madden, went to the Vineyard in February to solicit public comment. Residents came to the meeting with a host of concerns but also some encouragement for the federal agency's plan to use the ocean as a testing ground for the development of offshore wind power. Jonathan Mayhew, a commercial fisherman and Chilmark Selectman, said he was pleased with the general direction but singled out the northwestern lease blocks in the area as a problem spot. Earlier that day at a meeting in New Bedford, commercial fishermen voiced their concerns about the effects on winter flounder from offshore wind farms.

continued on page 9



continued from page 8

Jo-Ann Taylor, a coastal planner for the Martha's Vineyard Commission, noted that the same area also sees frequent sightings of fin whales. "We know that the fin whale spends the summer in our waters," she said. "Ideally we would avoid [building in] a core habitat. Ms. Taylor suggested that construction take place during times of the year that do not overlap with the whales' migration, an idea that Maureen Bornholdt of BOEM said the agency would consider in its environmental review. She noted that her agency had just carried out studies on electromagnetic field impacts to sharks and rays, was undertaking one on American lobster and



Commerical fishermen are concerned about the effects of wind farms on winter flounder. Photo credit: Wikimedia.org

could piggyback on the ecological experience of oil and gas construction in the Gulf of Mexico. Tisbury selectman Tristan Israel pressed officials to send home some of the offshore profits. Ms. Bornholdt said her agency derives its authority from the Energy Policy Act of 2005, which does not require revenue sharing for projects in federal waters more than six miles offshore. The discussion was not entirely orderly. The start of the meeting was disrupted by an agitated member of the audience wearing a bright flashing head lamp. "Do you know you have a flashing light on?" Assistant Secretary for the MA Executive Office of Energy and Environmental Affairs Bill White asked the man, who did not identify himself. "Do you know there's going to be like thousands of flashing lights like this on the south side of the Vineyard? It's totally outrageous," the man said, before storming out. Excerpted from <http://www.mvgazette.com/article.php?33976>

Aqualia Eyes Large-Scale Algae Biofuel Production

A water management company plans to launch a commercial-scale demonstration project using wastewater to cultivate algae for biofuel production. Spain's Aqualia, owned by construction and services company FCC, in collaboration with European partners, has already started construction of algae culture ponds at a wastewater treatment plant in Chiclana, northern Spain, to produce

biodiesel and biomethane. The project will cultivate fast-growing micro-algae by using the nutrients in waste water and converting it into biofuels like biodiesel and bio-

methane which can be used in transport fuel. Micro-algae has benefits over first generation biofuel crops like palm oil, sugar cane and canola; it can be grown in as little as three days and needs less land than other biofuel crops. Most biofuels are currently derived from land crops, including sugar cane, maize and vegetable oil,

which have been criti-

cized for competing with food production for water and land resources, prompting the search for alternatives. Some of the alternatives being explored - called second generation biofuels - come from wood, waste, grasses and agricultural residues and from algae. However, algae biofuel has only been demonstrated at small scale and has not been cost effective. Many researchers estimate that production of micro-algae biodiesel on a commercial scale is at least ten years away. Excerpted from <http://planetark.org/wen/64863>

The Next Wave

A new government-sponsored study has found that the ocean waters surrounding the U.S. contain enough energy to potentially supply more than half the nation's electricity demand. Even with the limits of today's technology, scientists concluded, there's sufficient recoverable energy offshore—some 1,170 terawatt-hours a year in all—to keep a third of the country humming. However, only 5 megawatts of electricity—enough to light about 4,000 American homes—is currently being generated by wave energy worldwide, despite years of work by a plethora of startups and many millions of dollars in government support, according to research firm Bloomberg New Energy Finance (BNEF). Before the financial crash, the great green tech boom unleashed a rush of startups and specu-



continued from page 9

continued from page 1

lators staking claims on federal waters to build massive wave farms. In Europe, governments including Portugal and Scotland placed big bets on wave energy. But “earning green” off blue power soon proved to be so much “California dreaming” as plans for West Coast wave energy arrays sank under opposition from surfers, fishermen and local residents. And when companies finally began deploying their first wave energy generators in Europe, punishing ocean conditions took their toll as some devices broke down or failed to perform as expected. “They may work well in prototype in a very small size, but when you scale them they don’t necessarily work as well in a harsh seawater environment,” says Angus McCrone, who follows the wave industry for BNEF. But now, thanks to advances in software, a new generation of startups such as Columbia Power are cheaply and quickly testing hundreds of new designs in virtual oceans while veterans of the industry are perfecting their technology to wring more energy from waves and lower the cost of electricity. Multinational corporations like Lockheed Martin and Alstom, the French energy giant, have struck partnerships with startups to commercialize their technology.

“We see wave energy as a very serious market for renewable energy in the future,” says Tim Fuhr, director of ocean energy for Lockheed Martin. “Basically, we see the ocean as the largest untouched source of power on the planet.” Columbia Power plans to pull their SeaRay prototype from the water in March, having accumulated a year’s worth of data on its performance, and build the full-scale, 80-foot-long Manta wave generator for deployment in 2013. Columbia Power expects it’ll take \$30 million to move into production. McCrone of BNEF says the true price of wave energy

won’t be known until mass employment begins, sometime after 2020. “I think the opportunity is still there,” he notes, “and if anything the opportunity is confirmed as being bigger than people might have thought before.” Excerpted from <http://www.forbes.com/forbes/2012/0227/technology-ocean-energy-searay-columbia-power-next-wave.html>

the *National Environmental Policy Act* (1969), the *Clean Air* (1970) and *Clean Water* (1972) Acts, and the *Marine Mammal Protection* (1972) and *Endangered Species* (1973) Acts. With the creation of new agencies to implement these new laws--the Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA)--it was the beginning of a new era.

In 1976, federal management of marine fisheries was virtually nonexistent. With the exception of state managed waters, federal activities were limited to supporting a patchwork of fishery-specific treaties governing international waters, which at that time extended only 12 miles off our nation’s coasts. A primary impetus of the Magnuson Act was to extend the U.S. exclusive economic zone (EEZ) out to 200 miles and eliminate competition off our coasts from foreign fishing fleets.

Modeled on the notion of standards and catch limits, the law also included an innovative regional public-private management framework, i.e., the fishery management council system. The

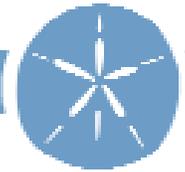
Magnuson Act laid the foundation for what has matured into the regional, science-based fishery management process which exists in the US today. But the initial victory for conservation was short-lived. By the late 1980s, without effective regulatory restraints in place, the Americanization of the fleet and advancements in fishing technologies overran the slower-growing science and management



Breakfast on a pile of scallops - Nantucket Lightship Closed Area. Photo credit: Geoffrey Day (<http://changents.com/geoffrey-day/biography>)

infrastructures, exploding the rate of domestic-driven overfishing and quickly leading to the depletion of some of the nation’s most iconic fisheries--perhaps the most painful being the historic collapse of the country’s oldest, the New England groundfish fishery. The Magnuson Act was at a turning point. The 1996 amendments to the Act provided needed

continued on page 11



continued from page 10

adjustments, including a new focus on habitat and the requirement for a 10 year rebuilding timeline.

Since that time, the Magnuson Act has undergone several reauthorizations. The most recent and transformative change was in 2007, when Congress gave NOAA and the regional fishery management councils a clear mandate, new authority, and new tools to achieve the goal of sustainable fisheries within measureable timeframes. Notable among these were the requirements for annual catch limits and accountability measures to prevent, respond to, and end overfishing—requirements that are delivering results. Today, many stocks that were overfished are rebuilt or actively rebuilding. Successes include summer flounder, monkfish, scallops, ling cod, sablefish, North Atlantic swordfish, vermillion snapper, and gag grouper. One notable new development, emphasized in the 2007 reauthorization was a focus on consideration of catch share programs. Catch share programs are intended to promote fishing based on good business decisions and stewardship practices rather than on the earlier years of ‘race-to-fish’ or ‘days-at-sea’ strategies that were often as dangerous for crews as they were unsustainable for the resource. Commercial and recreational fishing industries depend on healthy and abundant fish stocks and marine ecosystems to provide lasting jobs, food and recreational opportunities. Fishing alone generates \$72 billion per year and 1.9 million full and part-time jobs.

Today, the 35 year old Magnuson Act is at another turning point—one that calls for a more inclusive collaboration between fishing industries, conservationists, consumers and the broader seafood supply chain. We are heading to-

ward a future where we redirect our attention from **ending overfishing to maintenance of sustainable fisheries**. And as we turn this corner, we must face the more difficult challenges of habitat degradation and international illegal fishing--practices that are undermining the health and abundance of our global ocean resources. The success of the Magnuson Act and the visions of its architects have placed the nation on solid ground for this continuing journey--but only if we continue to work together.

Excerpted and adapted from several online NOAA articles:

35th Anniversary of the MSA

<http://www.nmfs.noaa.gov/stories/2011/20110411roadendoverfishing.htm>

Fishery Management Councils at Heart of MSA

http://www.nmfs.noaa.gov/stories/2011/06/2_magnuson_nominations.html

Eric Schwaab - Look Ahead 2012

http://www.nmfs.noaa.gov/stories/2011/12/eric_qa.html

Status of Stocks 2012

http://www.nmfs.noaa.gov/stories/2011/07/status_of_stocks.html

Historic Milestone in Fisheries Management

http://www.nmfs.noaa.gov/stories/2012/03/3_9_annual_catch_limits2012.html

"40 Years of the Coastal Zone Management Act: Impacts and Innovations" A Special Issue of the Journal *Coastal Management* Abstracts due April 13, 2012

We are pleased to announce that Taylor and Francis (T&F), the publisher of the journal *Coastal Management*, is once again partnering with TCS on a special issue of the journal. In 2011, T&F published an issue of *Coastal Management* that dovetailed with the theme of the TCS22 closing plenary, "Making the Connection: Translating Science into Effective Coastal Policy." That effort resulted in such a successful assortment of thoughtful articles, we decided to do it again! This upcoming special issue will conflate with the theme of the opening plenary of the TCS23 conference, "40 Years of the Coastal Zone Management Act: Impacts and Innovations." Guest editors for the issue are **Kristen Fletcher** (Executive Director, Coastal States Organization and past-president of TCS) and **Bob Bailey** (Coastal Manager, ret.).

Abstracts should be emailed to Kristen Fletcher, kfletcher@coastalstates.org by **April 13, 2012**. Requests for additional information can also be directed to Kristen.

**Global Marine Renewable Energy Conference**

April 24-26, Washington, DC
<http://www.globalmarinerenewable.com/>

Coastal Cities Summit II, 2012

April 30-May 3, 2012, St. Petersburg, FL
www.coastalcities-ioi.org/

Australasian Aquaculture 2012

May 1-4, 2012, Melbourne, Australia
<http://www.australian-aquacultureportal.com/austaqua/aa10.html>

World Conference on Water, Climate and Energy

May 13-18, 2012, Dublin, Ireland
<http://www.iwa-wcedublin.org/>

Global Conference on Oceans, Climate and Security

May 21-23, 2012, Boston, Massachusetts
<http://www.gcoocs.org/>

Islands of the World XII Conference 2012: Globalization; Islands Adapting to Change

May 29-June 1, 2012, British Virgin Islands
<http://www.hlsc.edu.vg/islandxii/>

The Coastal Society's 23rd International Conference

June 3-6, 2012, Miami, FL
<http://www.thecoastalsociety.org/conference/tcs23/index.html>

ECSA 50: Estuarine Coastal and Shelf Science: Today's Science for Tomorrow's Management

June 3-7, 2012, Venice, Italy
<http://www.estuarinecoastalconference.com/>

Capitol Hill Ocean Week 2012: One Nation, Shaped by the Sea

June 5-8, 2012, Washington, DC
<http://nmsfocean.org/>

Coastal Zone Canada 2012

June 10-15, 2012, Rimouski, Quebec, Canada
<http://www.cxca-azcc.org/html/conferences/mail.html>

Sustainable Tourism 2012; 5th International Conference

June 13-15, 2012, A Coruna, Spain
www.wessex.ac.uk/12-conferences/sustourism-2012.html

2012 Climate Adaptation Conference

June 25-28, 2012, Melbourne, Australia
<http://www.nccarf.edu.au/conference2012/>

Islands 2012, 2nd International Conference on Island Sustainability

September 17-19, 2012, Island of Brac, Croatia
<http://www.wessex.ac.uk/12-conferences/islands-2012.html>

Coast to Coast 2012, Living on the Edge

September 17-21, 2012, Brisbane, Queensland
<http://www.coast2coast.org.au/>

The SUSTAIN International Conference: Delivering Sustainable Coasts

September 18-19, 2012, Southport, UK
<http://www.sustain-eu.net/news/SUSTAIN-Conference-announcement.pdf>

Littoral 2012: Coasts Of Tomorrow

September 27-29, 2012, Kursaal, Oostende, Belgium
<http://www.sdimag.com/littoral-2012-coasts-of-tomorrow.html>

4th International Conference on Estuaries and Coasts

Oct. 8-11, 2012, Hanoi, Vietnam
http://www.irtces.org/isi/WebNews_View-en2.asp?WebNewsID=656

6th National Conference on Coastal and Estuarine Habitat Restoration: Restoring Ecosystems, Strengthening Communities

October 20-24, 2012, Tampa, FL
www.estuaries.org/conference

CERF 2012: The Changing Coastal and Estuarine Environment: A Comparative Approach

November 11-14, 2012, Mar del Plata, Argentina
<http://www.erf.org/CERF2012>



Island in Prince William Sound at low tide, South Central Alaska.
 Photo Credit: NOAA



DUKE UNIVERSITY

While the majority of the chapter officers took a class on Midway Atoll, a remote part of the Northwest Hawaiian Island chain, the remaining officers planned and coordinated a Blue Drinks to compliment Sylvia Earle's speaker event. A good group of people turned out to mingle with Sylvia while enjoying drinks and snacks at the North Carolina Maritime Museum.

On Tuesday, February 21, the Duke Chapter hosted Dr. Bryan Wallace, the Director of Science and Strategy for the Global Marine Program at Conservation International as he gave a talk titled, "Global Conservation Priorities for Marine Turtles: Fisheries Bycatch in Focus." Utilizing teleconferencing, we had a turnout of more than 50 people in Beaufort and Durham combined, comprised of students pursuing Master's degrees and PhDs, postdoctorates, staff and faculty.

EAST CAROLINA UNIVERSITY (ECU)

The New Year began with an officers' meeting on January 9. There have been three monthly members meetings. There are now approximately 30 members, with 20 usually in attendance at each meeting. The January meeting was just a gathering to update everyone on plans for the rest of the semester. At the February 3 meeting, Mahealani Kaneshiro-Pineiro, a student in the Coastal Resources Management Program (CRM) gave a talk related to her PhD dissertation entitled, "*Confessions of a Jellyfish Researcher: A Synopsis of Jellyfish Research in North Carolina.*" On March 2, following the usual business update, PhD candidate Cecilia Krahforst, made sure we understood the difference between seaweed and seagrass before telling us about the *Survey of Submerged Aquatic Vegetation off North Carolina*.



Regional high school students compete in the Blue Heron Bowl event at ECU. Photo credit: Chad Smith

On March 3, members helped with the Blue Heron Bowl event at ECU (<http://www.ecu.edu/icsp/bhb2012/>). Local high school students enthusiastically competed in this regional competition for the National Ocean Sciences Bowl.

On March 22, members had a special viewing of two films, "Fishmeat" and "Farming Our Seas" with a chance to discuss the films with a panel including the film's director. To close out a very successful year for the ECU Chapter of TCS, we plan to follow our April 5th business meeting with a social, including good food and music at a venue off campus.

STANFORD UNIVERSITY

We are currently planning a number of events, including:

- beach cleanups
- tidepool visits (education/outreach)
- a seafood traceability study: sampling fish in San Francisco restaurants and getting them DNA-sequenced to discover whether there has been any mislabeling of fish. The outcomes of this study will be highlighted in a press release, as well as in the context of our Sustainable Seafood Week in May.
- Sustainable Seafood Week will feature sustainable seafood dishes in the Stanford dining halls, as well as visits by various California NGOs working on sustainable seafood issues.

Our chapter also celebrated the passage of California's ban on the sale, possession, and distribution of shark fins in the state, with an entire week of shark-related events. A description of all this entailed can be found on page 14.

UNIVERSITY OF RHODE ISLAND

During January a small potluck dinner was held at a member's house to celebrate the new semester and get reacquainted. Topics discussed included theses, major paper and dissertation topics, preparation for Comprehensive Exams, upcoming theses and dissertation defense, and courses being taken during the semester. It was a wonderful evening. In the spring, we hope to complete two beach cleanups at our adopted public access site. Members are always alerted to and encouraged to attend relevant speaking engagements that are advertised through the University or otherwise discovered. Theses and Dissertation defense will also serve as events where members can gain insight into what other students have studied and perhaps be inspired in their own work. To help prepare members who are presenting at TCS23 in June, we will have a mini-conference of our own to hear what our peers will be presenting. Before the end of the semester, we anticipated we'll have a new chapter President for the 2012-2013 school year, perhaps with another member joining them to split duties in organizing events.



STANFORD UNIVERSITY CELEBRATES SHARKS

By Lida Teneva

In October 2011, California Governor Brown signed AB 376 into law, outlawing the sale, possession, and distribution of shark fins in the state. Since California has been the biggest market for shark fin products outside of Asia, this was a landmark piece of legislation. Hawaii, Oregon, Washington, Guam, and the Northern Mariana Islands have passed similar legislation as well. Regions which have banned shark finning or have established shark sanctuaries, include Palau, USA, Taiwan, Dominican Republic, most nations in Central America, Maldives, Marshall Islands, The Bahamas and Chile.

Sharks are crucial for healthy oceans, but they are in trouble. However, there is significant momentum building globally for shark conservation. That's why the Stanford University chapter of The Coastal Society wanted to celebrate sharks and efforts to save them. We organized a whole week's worth of events on the Stanford main campus, to educate people about the importance of sharks for the global ocean as well as the current plight of sharks, with many species hunted close to extinction due to huge demand for their fins in Asia.

People tend to have a love-hate relationship with sharks. Most people love Discovery Channel's Shark Week, but many are deathly afraid of sharks due to the popular image of them as monsters of the sea. As demonized as sharks are,

they have been prized for centuries in Chinese culture as powerful creatures, and the consumption of their fins by emperors has been viewed as a symbol of status. Age-old fear and reverence for sharks is now intertwined with a voracious demand for this luxury item by an expanding middle-class in China and Hong Kong. Shark fin soup is now frequently served at weddings, banquets, and business meetings.

This demand fuels a massive hunt globally for sharks. More than 70,000,000 sharks are killed each year--for soup. This has resulted in 90% population declines in many species. Because shark fin is pound-per-pound the most valuable seafood, fishermen save space on their boats for more fins by catching sharks, cutting their fins off (i.e. the practice of finning) and then throwing the animal back into the ocean to bleed and drown. It is deplorable yet extremely lucrative. Fin prices range in the hundreds of dollars per pound. Few nations have any legislation against shark finning, which is why shark finning is rampant in every part of the world's ocean.

Sharks are crucial for maintaining for ocean health; as apex predators they help preserve ecosystem balance. Their continued decimation is likely to have significant impact on the populations of many commercial fish species, stocks of which depend on a healthy ocean ecosystem balance. Sharks have been shaping marine food webs for more than 400 million years but many species could go extinct in our lifetime.

During the week of February 6-10th, the Stanford University chapter of The Coastal Society organized film screenings, guest lectures, photo exhibits, and a shark conservation policy panel discussion. We were supported by multiple campus organizations and departments including the Center for Ocean Solutions, the Bob Barker Fund for Animal Rights through the Stanford Law School, the Graduate Student Council, the Environmental Earth System Science Department, the Emmett Interdisciplinary Program in Environment and Resources, and others.

Regional NGOs also supported us with materials and participation. WildAid, www.wildaid.org, is an organization focused on ending wildlife trade in endangered species. They have a massive campaign worldwide advocating the importance of sharks and working to influence consumer behavior in Hong Kong and mainland China. They have a base in San Francisco, and provided us with wonderful outreach materi-



Photo credit: Stacy Aguilera



Photo credit: Stacy Aguilera

als on the current state of shark populations and shark conservation. In addition, David McGuire, leader of Sea Stewards, www.seastewards.org, joined us on February 7th, to discuss the involvement of his organization in various shark conservation efforts regionally and nationwide.

We were in contact with Shawn Heinrichs, www.bluospheremedia.org, an award-winning marine conservation-focused photographer and filmmaker. Shawn has been working with the Global Shark Conservation Program of the Pew Environmental Group, documenting the rampant, cruel, disturbing reality of shark finning around the world. He sent us many images of his campaigns in Taiwan, Indonesia, and Japan, and we created a photo exhibit here on campus. Strategically placed in a foyer with high people traffic daily, the large panels with Shawn's shark finning photos drew a significant response in the Stanford community and were a very effective outreach tool to help people understand what's happening in the ocean. Several Stanford student art pieces by Ethan Estess, highlighting shark issues were also featured in this exhibit.

We screened the award-winning shark film, *Sharkwater*, www.sharkwater.com, with permission from the producers, who were pleased with our outreach activities on behalf of sharks. The movie is poignant and compelling, portraying most shark species as gentle sentinels of the seas, but also unveiling the hugely lucrative shark fin trade, especially in Costa Rica and Galapagos at the time (2007).

Guest shark scientists during the Stanford Shark Week included Barbara Block and Francesco Ferretti, both from Stanford's Hopkins Marine Station in Pacific Grove, California. Dr. Ferretti focused on reconstruction of shark populations through history, focusing on the fact that we only have 10% left of many species. If we keep catching them at current rates, many species of sharks will become extinct within the next 50 years. Dr. Block gave an incredible talk on great white sharks in the California Current System and the North Pacific, describing her team's work in the last decade, elucidating the role of the US West Coast as an important shark population hub.

The highlight of the Stanford Shark Week was the shark conservation policy panel, on February 9th, 2012, featuring leaders who fought for the successful shark fin trade ban in California. This legislation's success was the stimulus for the organization of Stanford Shark Week. The panel was led by Meg Caldwell, Director of the Environmental and Natural Resources Law and Policy Program at the Stanford Law School, and Executive Director of the Center for Ocean Solutions. The distinguished panelists included Assemblyman Paul Fong, co-author of AB 376; Michael Sutton, Vice-President of the Monterey Bay Aquarium and Director of the Center for the Future of the Oceans; and Jennifer Fearing, California Director of the Humane Society of the United States. The panel eloquently and inspirationally highlighted what it took to win the battle for this shark fin trade ban bill, including the complexities, lessons learned and recipes for success. A coalition of California conservation organizations, matched by political will really worked in California compelling this important step in shark conservation.

We hope and believe that Stanford Shark Week has inspired more people in the Stanford community to care about sharks, to spread the word about the importance of sharks, and to celebrate these amazing and precious creatures. The combination of photo exhibits, film screenings, science talks, and policy discussions was really successful and we are grateful for the generous financial support of various Stanford organizations.

Lida Teneva is co-President of the Stanford University student chapter of The Coastal Society. She's a 4th year PhD student focusing on coral reef resilience.



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

OFFICERS

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

Kate Killertain Morrison (President Elect)
Sargasso Sea Alliance Initiative
E-MAIL: kk Morrison1@gmail.com

Jeff Benoit (Past President)
Restore America's Estuaries
PH: (703) 524-0248
E-MAIL: jbenoit@estuaries.org
(Special Projects Committee Co-Chair)

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

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

DIRECTORS

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

Dr Patrick L. Lawrence
University of Toledo
PH: (419) 530-4128
E-MAIL: patrick.lawrence@utoledo.edu

Susan White
Hollings Marine Laboratory and Center for Excellence in Oceans and Human Health, NOAA National Center for Coastal Ocean Science
PH: (843) 762-8993
E-MAIL: Susan.white@noaa.gov

Ex-Officio:
Paul Ticco
Office of National Marine Sanctuaries
PH: (301) 713-7240
E-MAIL: paul.ticco@noaa.gov

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

Rebekah Padgett
Washington State Department of Ecology
PH: (425) 649-7129
E-MAIL: rpadd461@ecy.wa.gov

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

Ex-Officio:
Ariana Marshall
Florida A & M University
PH: (850) 599-3550
E-MAIL: ariana1.marshall@famu.edu

Susan E. Farady
Roger Williams University School of Law
PH: (401) 3254-4613
E-MAIL: sfarady@rwu.edu

Bhaskaran Subramanian, Ph.D.
Maryland Department of Natural Resources
PH: (410) 260-8786
E-Mail: bsubramanian@dnr.state.md.us

STUDENT CHAPTERS

University of Delaware
President: Katya Wowk
E-MAIL: Katya.wowk@noaa.gov

East Carolina Student Chapter
<http://www.ecu.edu/org/tcs/>
President: Chad Smith
E-MAIL: smithmich@ecu.edu

University of Rhode Island
President: Rebecca Eith
E-Mail: uram10@my.uri.edu

University of Washington
President: Breana Apgar-Kurtz
E-MAIL: breenaak@uw.edu
<http://students.washington.edu/tcsuw/>

Duke University Student Chapter
<http://www.nicholas.duke.edu/people/students/tcs/index.htm>
President: Caitlyn Zimmerman
E-MAIL: caitlyn.zimmerman@duke.edu

University of Hawaii
Currently inactive
Contact: John Carey
E-MAIL: careyj@hawaii.edu

Stanford University
President: Lida Teneva
E-MAIL: Lida.teneva@gmail.com

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 Sarah Young

Tax Preparation
Swart, Lalande & Associates, PC
Chas Rannells
PH: (703) 361-6126
E-MAIL: crannells@slacpa.com



THE COASTAL SOCIETY MEMBERSHIP FORM

Name: _____
Last First Middle Initial

Organization: _____

Street: _____

City/State/Zip: _____

Country: _____

Home Address (if preferred mailing address): _____

Daytime Phone: _____ E-Mail: _____

Present Occupation: _____

Primary Interest: _____

TCS Chapter Affiliation (if any): _____

Sponsored/Referred by: _____

Type Membership (Check one):

• Regular, \$60 US	(professionals or interested citizens)
• New Professional, \$40 US	(out of school fewer than two years) Name of academic institution: Date of graduation:
• Retired, \$40 US	(over age 65 and retired from full time work) Date of retirement: Former employer:
• Student, \$20 US	(enrolled in a graduate, undergraduate or secondary level academic program) Academic advisor - Name: email:
• Library, \$50 US	(library)
• Institutional, \$250 US	(institution or organization; list two individuals' names and email addresses on form)
• Corporate, \$500 US	(company, business, or organization; list four individuals' names and email addresses on form)

Signature: _____ Today's Date: _____ Thank you!

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/membership2.html.