



## National Assessment of Shoreline Change

*Adapted from USGS web news*

Beach erosion is a well-known, chronic problem along many open-ocean shores of the United States. As coastal populations continue to grow and community infrastructures are threatened by erosion, there is increased demand for accurate information regarding past and present trends and rates of shoreline movement. There is also a need for a comprehensive analysis of shoreline movement that is consistent from one coastal region to another. To help meet these national needs, the U.S. Geological Survey (USGS) is conducting an analysis of historical shoreline changes along open-ocean sandy shores of the coterminous United States and parts of Hawaii, Alaska, and the Great Lakes. One purpose of this work is to develop standard, repeatable methods for mapping and analyzing shoreline movement so that periodic, systematic, internally consistent updates regarding coastal erosion and land loss can be made nationally. In the case of this study, the shoreline is the interpreted boundary between the ocean water surface and the sandy beach.

The report on the New England and Mid-Atlantic coasts is the fifth in a series of reports on historical shoreline change. Previous investigations include analyses and descriptive reports of the Gulf of Mexico, the Southeast Atlantic and, for California, the sandy shoreline and the coastal cliffs. This report, like the earlier reports, summarizes the methods of analysis, interprets the results, provides explanations regarding long-term and short-term trends and rates of change, and describes how different coastal commu-

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## High School Students Determined to Make a Difference

*By Ellen Gordon*

Coastal America's 3rd National Student Summit on the Ocean and Coasts kicked off at dinner time on Valentine's Day, with the always entertaining cartoonist and ocean advocate Jim Toomey, creator of the comic strip, "Sherman's Lagoon." Sketching while he spoke—with his efforts projected up on a screen—Toomey both amused and inspired his audience of national student delegates. The National Oceanic and Atmospheric Administration's Director of Policy, Sally Yozell also welcomed the students and described the Administration's efforts to address the nation's coastal and ocean issues.

Designed to develop future ocean scientists and leaders and teach high school students about the interconnectedness between the ocean, Great Lakes, inland seas and climate, the theme of this Student Summit was the Third Principle of Ocean Literacy: *The ocean is a major influence on climate and weather--and its inverse.* It is one of seven essential principles of K-12 ocean sciences established in 2005 by the National Marine Educators Association. Back in January 2004, the Coastal America federal partnership and its network of Coastal Ecosystem Learning Centers (CELCs) organized the 1st National Student Summit on Ocean issues. One highlight of the first summit was the opportunity to provide a student voice in the deliberations of the U.S Commission on Ocean Policy. The summit participants addressed such coastal issues as tidal power, habitat restoration, conservation of wildlife, and ocean literacy programs. In 2006, Coastal America celebrated its 10-year partnership with the

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CELCs by hosting the 2nd National Student Summit on Oceans and Coasts. Bringing formal and informal educators together with students, the gathering was intended to advance an ocean-literate and involved citizenship that went beyond summit participation and school curricula.

"I feel like there's hope for the future; there are so many people doing things to help."

The purpose of the 3rd summit, appropriately, was three-fold: (1) to educate, inspire and engage the next generation of leaders in marine

science, protection and ocean governance; (2) to engage students in collaborative action to address local coastal issues; and (3) to foster stewardship by creating ocean-literate citizens. An exceptional feature of the gathering was that it provided the students with unprecedented access to national ocean leaders, with speakers from senior levels of government and the nongovernmental community.

Each of the student delegations (3-4 individuals, ranging from 9th through 12th grade, supported by a teacher and CELC educator) represented a different learning center. Twenty delegations, drawn from around the US—from Alaska to Florida, and one from Vera Cruz, Mexico—prepared for the summit by researching an issue affecting their community, developing an action plan to address that issue, and then presenting their work through videos and posters. The summit provided them an unparalleled opportunity for expert feedback from Administration officials and nationally known scientists, numerous interactions with acclaimed speakers and members of the ocean and climate community, and an opportunity to build a network with other future ocean and climate leaders.

So it was that day two of the four day Student Summit, (at Baird Auditorium in the Smithsonian's National Museum of Natural History (NMNH)) really heated up when the student delegations began presenting their action plans to an engrossed audience and panels of ocean experts. Though some of these high school students might have been nervous, their poise and evident preparation was more characteristic of undergrad or even graduate-level work. The young international team of 9th graders from Mexico described their efforts to improve their peers' awareness of ocean and water quality problems. The delegation from the North Carolina Aquarium at Fort Fisher demonstrated their quick-thinking creativity with brief, humorous skits that they added last-minute

to their presentation. Inspired by Jim Toomey, this trio got to work dreaming up a creative, simple means to illustrate the effect of beach erosion! From the New England Aquarium, the delegation's project looked at the impact that decreasing dissolved oxygen levels are having on the cold water Atlantic herring fishery in the southern Gulf of Maine. Over at the Aquarium of the Pacific, students were addressing Los Angeles' excessive carbon footprint by educating informal audiences through an interactive climate change solutions-based



Student delegation from the NC Aquairum at Fort Fisher depicting impacts of beach erosion. Credit: Susan Baker

game. Leading by example, these students are also in the midst of converting a donated gas-engine car into an electric powered outreach vehicle. All of the delegations received constructive suggestions on improving their projects from the panel experts sent by federal agencies and private organizations.

Illustrating the diverse backgrounds from which some of the participants drew, this second day of the summit actually began with a special Native American welcoming song, performed by Bearano Old Coyote, a Suquamish tribal member, and one of the students comprising the Seattle Aquarium delegation. Asked later about it's meaning, he described it as "a thanks to Creator for providing us with shellfish, such an im-

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Waikiki Aquarium student delegation at poster session. Credit: Susan Baker

portant part of our lives.” These 4 students, all Suquamish tribal members, spoke of how elders have passed on so much knowledge to them, and of their desire to follow that custom, and to pass on understanding that will help preserve their culture. They are concerned because ocean acidification is affecting shellfish, a

vital part of their tribe’s life and livelihood.

“You have to be passionate about your project, so you can convince others to be interested and to care.”

The delegation from Monterey Bay Aquarium, all Latino, targeted their own neighborhoods

with the catchphrase, “Su casa es mi casa;” a reversal of the conventional, “my house is your house.” The students looked at the problem from sea critters’ point of view; i.e., our land-generated pollution is messing up their home. On the frontlines of “peer pressure,” many of the students’ projects focused on how to twist the effect for positive outcomes. Often advocating for personal changes, they argue that single actions taken by enough individuals could begin to turn climate change around; that however small an effort may be at its start, it can produce a “snowball effect.” The students’ passion was a gratifying response to Dr. Nancy Knowlton, Sant Chair for Marine Science at the NMNH, when she addressed their Tuesday morning session, telling them, “Thank you for asking not

only what your ocean can do for you, but what you can do your ocean.”

“My favorite part of the summit was being able to talk to people who have a say in what goes on in the world.”

At the end of this challenging day, participants and other guests were treated to a captivating evening presentation by Jean-Michel Cousteau. Although his concerns about the condition of the ocean brought some somber moments, Cousteau’s gentle humor, entertaining stories of his adventures, and splendid video clips kept the audience entranced—until it was time to head up to the Sant Ocean Hall for the reception and poster session!

Wednesday, day three, brought a completely different format. Students, who had been chaperoned to DC by their teachers, were now split into a separate workshop. In their own seminar, educators had the opportunity to learn new techniques and hear about additional resources for bringing ocean science alive in their classrooms. Meanwhile the students—80 teenagers—explored methods of empowering local communities and



Student delegation from Hatfield Marine Science Center; Student-designed sweatshirt, with “Invertebrates, Kind of a Big Deal” on the front and “Grow a Backbone for Those Who Can’t” on the back. Credit: Susan Baker

worked to draft and reach consensus on a proclamation that declared their own concerns, commitment to action, and hopes for the ocean’s future.

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Meanwhile, the JASON Project—a nonprofit founded in 1989 by Dr. Bob Ballard to connect students with scientists in real and near-real time—was onsite and very involved. Student reporters from the organization circulated, informally questioning student delegates about their projects and the impacts of climate change on their communities. A JASON staffer also conducted in-depth studio interviews at the museum with a number of delegations, describing their projects and videos during a live broadcast for an international audience; see these at: [http://www.jason.org/science/Live/coastal\\_america/jason/event.aspx](http://www.jason.org/science/Live/coastal_america/jason/event.aspx). In an innovative use of social media, the February 15 events at the Summit were also streamed live to a nationwide audience, via the Smithsonian’s Ocean Portal, with a continuous interactive discussion on the student presentations via Twitter. Entire classes and even schools tied in to watch; the Summit broadcast website received more than 85,000 hits. The Smithsonian is currently archiving the student presentations as well as Jean Michel Cousteau’s presentation and they will be available soon for viewing at <http://ocean.si.edu/>.



Students present their summit proclamation to Representative Sam Farr, DOC Deputy Secretary Rebecca Blank and Jean -Michel Cousteau. Credit: Gina Cabrillo

“It’s been terrific meeting other delegates and learning from them, as well as learning from keynote speakers.”

The final day, Thursday, “Capitol Hill Day,” paired student delegations with a legislative liaison from one of the sponsoring federal agencies, to escort the stu-

dents through the halls of the House and Senate on visits to their Congressional representatives. At the closing luncheon in the Rayburn House Building, many students excitedly shared stories about those meetings and the lessons they hoped to take back to their communities. They presented a copy of the signed Proclamation that they had developed at their Wednesday workshop to Congressman Sam Farr, California Democrat and co-chair of the bipartisan House Ocean Caucus. Copies were also presented to Rebecca Blank, Deputy Secretary of the Department of Commerce, as a representative of the Administration, and to Jean-Michel Cousteau, as a representative of nongovernmental organizations. The proclamation—which spoke to the students’ passionate concern for the ocean, coasts, their planet—asked Congress to take action to invest in their future and in the health of the ocean. They stated their belief, “...that it’s time that US citizens learn what Native Americans have

always known; in order to show respect for the seven generations before and seven generations to follow, we must protect our Earth and its resources.”

“Shaking the hand of Jean-Michel Cousteau; how awesome is that?!”

The true value of the 2011 Student Summit, however, will follow the students home as they work over the next year to implement the projects in their local communities and prepare for their own future as leaders in ocean sciences and policy.



Student delegate Bearano Old Coyote performs a welcome song. Credit: Susan Baker