

USC Sea Grant 40th Anniversary
Special Edition Retrospective in honor of:

Dr. Burt Jones



Autonomous underwater glider. (Image courtesy of CINAPS)

From 'SC' to the Red Sea:

Dr. Burton Jones leaves USC and we celebrate his invaluable legacy of research, teaching and outreach in Southern California

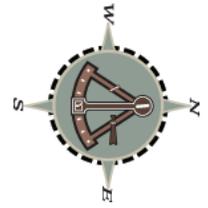
This year, Sea Grant celebrates its 40th Anniversary as a regional research and education program serving Southern California and the nation. As part of our celebration, we highlight the achievements of Dr. Burton Jones, Research Professor in the Marine Environmental Biology section of the Department of Biological Sciences at the University of Southern California (USC). He recently assumed the position of Professor of Marine Science in the Chemical and Life Sciences and Engineering Division and Red Sea Research Center of the new King Abdullah University of Science and Technology in Saudi Arabia. This is an exciting step forward for Burt, and USC Sea Grant wishes him all the best in his future work. Burt's departure is, however, a huge loss for the study of Southern California's marine ecosystem; his contributions to the oceanographic knowledge of this area and his ability to create interdisciplinary partnerships between scientists and those who apply the science to real world problems is unparalleled.

All of us at USC Sea Grant thank Burt for his invaluable scientific and outreach contributions to our understanding of the urban ocean environment. His work has melded biology and technology together to enable us to better visualize and analyze the complex and dynamic oceanographic systems off the Southern California coast. We can now track and watch the movement of a plume of storm water when it enters Santa Monica Bay and other nearshore environments, and we can see a harmful algal bloom in real time as it moves along the coast. Burt has opened our eyes in new ways to the mysteries below the surface, and we recognize his achievements in Southern California as he moves on to investigating the waters of the Arab Peninsula.

*-Phyllis Grifman,
Associate Director, USC Sea Grant*



Dr. Burton Jones, USC.
(Image courtesy of CINAPS)



USC Sea Grant's Urban Ocean Report, June 2012, Vol 4, No. 1

URBAN MARINER

University of Southern California
Sea Grant

An Interview with Dr. Burton Jones



Dr. Burton Jones, USC.

What has Sea Grant funding allowed you to do that you might not have been able to do otherwise?

SG gave steady funding that provided the ability to take projects and move them into the applied environment and help agencies that were interested in water quality issues. The agencies could then leverage these activities to fund larger efforts.

What is your most memorable moment of lab/field research in your time at USC?

We were in the Sea of Japan/Korean East Sea in June of 1999. We had a tow vehicle in the water that was undulating between 350 meters and the surface. All of a sudden one of our sensors on the vehicle quit sending data, and the vehicle was flying a bit erratically. After pulling the vehicle aboard, we discovered a big dent in the nose of the vehicle where our sensor was located and the tail section with attached sensors was dangling from the vehicle by the power and data cable. After the cruise, careful inquiries indicated that we had probably hit a US submarine that was using our ship as a noise cover while playing cat & mouse with other vessels in the region!

What have you learned from working in the Southern California urban ocean environment?

There is hope! One thing that has become clear in Southern California is that there have been steps taken that have improved both the quality of the coastal ocean environment and its overall management. Our work, much of it facilitated by Sea Grant, has enabled us to develop technologies for evaluating the coastal ocean, to investigate the interaction between anthropogenic inputs and coastal biological processes, and to collaborate with dischargers, monitoring agencies and regulators to affect future policy and management.

What have you learned from your work in Southern California that you will take with you to the Red Sea?

A lot! We will use the techniques that we have developed to evaluate effects of anthropogenic inputs in the coastal ocean off of Southern California to examine their role in the oligotrophic Red Sea that has significant coral reef regions.

Any words of advice to students interested in oceanography?

Go for it. And make sure that it is “fun” for you. If you have fun doing what you are doing then you can tolerate the work that it takes to accomplish big tasks and achieve significant goals.

What partnerships have been the most interesting for you while working at USC and why?

Probably one of the most interesting partnerships has been the linkage between the regional monitoring agencies, regulatory agencies and basic scientists within academia, a collaboration we have been developing over the last 15-16 years. The culmination of this is that we now have in place the components of monitoring, ocean observing, ocean modeling, and experimental ocean sciences that allow us to genuinely explore the interactions of the urban milieu with the coastal ocean. The breadth and capabilities of the individuals who are involved in this effort make it one of the strongest consortiums concerned with the coastal environment in the world. So the science that we are doing is fundamental, but the applications are significant and immediate because this entire group is willing to interact with each other, work together, and honestly come to terms with the issues that we face.

Dr. Jones' Sea Grant Funded Research and its Application

Throughout his career, there has been one constant for Dr. Burton Jones: he has always had a set of eyes *in* the water. Even from his basement office at USC, he has kept a constant eye on Southern California waters by integrating his knowledge of biology and ecology with cutting edge technology. He may have started by towing simple instruments behind ships, but over time the need to see below the surface led to much more complex technology, such as winged vehicles and ultimately autonomous underwater gliders. "I always liked staying *in* the ocean," says Dr. Jones. "You see just a part of the story if you focus only on satellite imagery. Then you're looking at proxies and are seeing what has already happened."

Real-time monitoring has always been Dr. Jones's goal, and early on in his career at USC he found a way to track water pollution. There are two types of human bacterial inputs into Southern California waters: 1) treated sewage effluent discharged from pipes off the coast and 2) non-point source pollution which runs off of land into rivers or storm-drains mostly during the rainy season. Land-based runoff during the rainy season is clearly the more illusive of the two, as these inputs into the ocean are periodic, unpredictable, and their contents are unknown. Until Dr. Jones's began to study the real-time movement and dispersion of these plumes of bacteria-laden water in the ocean using optical and physical sensors, very little was known about what happened once these huge volumes of polluted water reached the nearshore ocean.

Using diligent and strategic water sample testing in Santa Monica Bay before, during, and after rainstorms, Dr. Jones was able to determine the type and amount of pollution entering the bay through stormwater, as well as how these plumes of polluted water then moved and dissipated along the coastline. The results of this research also have been used by various regulators, such as the Los Angeles Regional Water Quality Control Board and the Environmental Protection Agency, to evaluate the magnitude of the problems resulting from stormwater inputs to Santa Monica Bay. *(con't on page 4)*



Dr. Burton Jones preparing installation of moored buoys with physical and biooptical sensors. (Image courtesy of CINAPS)

"OCSD has worked with Burt on a sundry of projects ranging from helping our staff prefect their use of ocean sampling equipment to spatially tracking our discharge plume. What has impressed me most over the years, has been Burt's ability to effectively work in a variety of arenas—scientific, regulatory, discharger, and public—with a large variety of people with often vastly differing degrees of scientific training and understanding. He is a treasured resource who will be difficult if not impossible to replace.



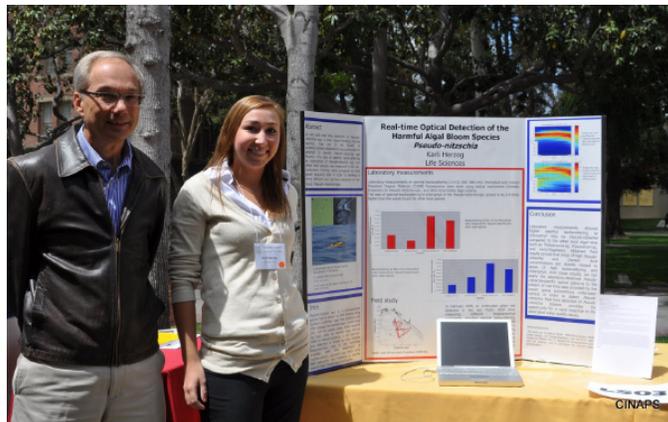
I've worked with Burt in lab settings, at sea, and in scientific and public meetings and his demeanor always remained cool, collected, and unflappable . . . well, perhaps not always. Once when Burt tried checking out his tow-yo, without making sure the 220 volts of power was turned off, he definitely did a lot of flapping, as well as show that he has more than a passing intimacy with classic sailor jargon!"

*—George Robertson,
Orange County Sanitation District,
Member of the Bight Project*

Dr. Jones' Sea Grant Funded Research and its Application (con't from page 3)

Dr. Jones was selected to chair the Water Quality Committee of the Southern California Bight Pilot Project, a far-reaching, long-term effort to fully understand and mitigate pollution problems in the entire region. This group is managed by the Southern California Coastal Water Research Project (SCCWRP) and consists of the major ocean dischargers (sewage treatment facilities) and local and regional water quality regulatory agencies between Santa Barbara, California and northern Baja California, Mexico. The Southern, California Bight Project continues today with coordinated monitoring throughout the region of not just water quality, but also other indices such as coastal ecology, shoreline microbiology, wetland health, habitat distribution, and species ranges and abundance.

To read more on the Southern California Bight Project history and most recent results:
<http://www.sccwrp.org/ResearchAreas/RegionalMonitoring/BightRegionalMonitoring.aspx>.



Dr Jones and undergraduate student, Karli Herzog.
(Photo courtesy of CINAPS)

With all this exciting research, it may be hard to believe that Dr. Jones has had time for anything else. However, with over 31 years at USC, Dr. Jones has an impressive legacy of students. During this time, he sponsored 30 students (24 Ph.D., 6 Masters) in multiple areas of science: oceanography (biological, physical, chemical), earth sciences, engineering, computer science, and even public policy. Naturally, they have gone on to a variety of careers including academic faculty and research positions, federal and state policy and management, local agencies within the great Los Angeles region, private engineering and technology-manufacturing development companies, and non-governmental organizations. Teaching has always been an important part of Dr. Jones' career, and at USC he taught undergraduate and graduate courses in biological oceanography, coastal processes, ocean optics and remote sensing, nitrogen cycling in the ocean, and phytoplankton ecology.

The breadth of courses he has taught and areas of focus offered to his students are reflective of one of Dr. Jones greatest strengths as a researcher and person: his ability to collaborate and communicate across disciplines and across diverse arenas such as academia, government, and business. This inclination toward interdisciplinary work and collaboration was critical for solving important issues along the Southern California coastline. In his own words, Dr. Jones says, "I consider myself a systems oceanographer. I'm interested in the interaction of physics, biology and chemistry and looking at the system as a whole." And there is no better way to look at the system as a whole than to involve people in a variety of disciplines in collaborative projects! "Partnerships are fascinating," says Dr. Jones, "because they draw together a broad spectrum of people and perspectives." (con't on page 5)

"Scientifically, Burt allowed me to find my own path, jumping in to help only when I lost the direction. One of the most important things he taught me is that there is no such a thing as a stupid question; that stupid thing is not to ask one. He showed me how to become an oceanographer, without losing the biologist in me."

—Dr. Ivona Cetinic,
Former Ph.D. student



Deploying the autonomous underwater glider. (Image courtesy of CINAPS)

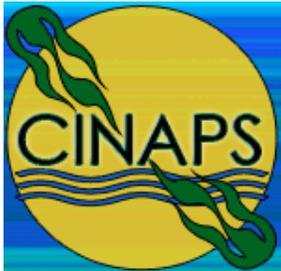
Dr. Jones' Sea Grant Funded Research and its Application (con't from page 6)

Dr. Jones, joined by other experts in robotics, computer science, and phytoplankton ecology, brought the applied oceanography expertise to the interdisciplinary group, the Center for Integrated Networked Aquatic Platforms, (CINAPS), headquartered at USC. CINAPS has designed and now operates an aquatic observing system of static and mobile aquatic sensors—including autonomous underwater vehicles or 'gliders'—together with a long-distance communication network off Southern California's urban coastline. To make this possible, CINAPS collaborates with other organizations such as The Applied Physics Laboratory of the University of Washington, the Northern, Central and Southern Ocean Observing Systems, The Center for Embedded Networked Sensing, the Jet Propulsion Laboratory, the Monterey Bay Aquarium Research Institute, and the Southern California Coastal Water Research Project. Like the integrated network of synapses in the human brain, homophone CINAPS' goal is to provide timely information on coastal water quality and harmful algal blooms to scientists, policy makers, and the general public.

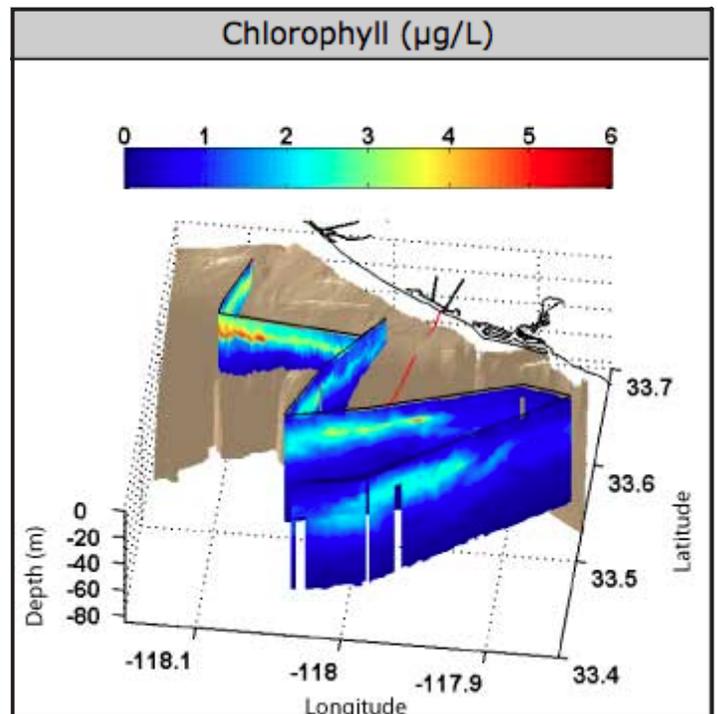
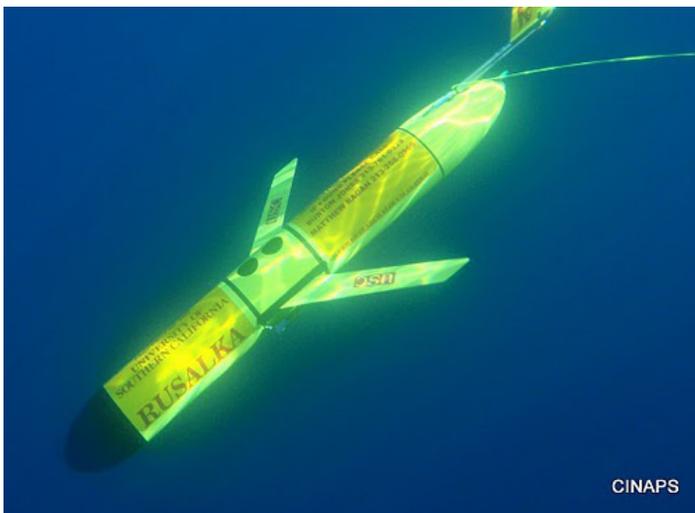
"Burt provided not only scientific contributions to SCCOOS, but good cheer and friendship."



-Julie Thomas,
The Coastal Data Information Program (CDIP)



Through the use of his gliders, as well as the stationary sensors placed strategically along the coast, Dr. Jones can monitor the coastal ocean 365 days a year. He and his colleagues can see the latest satellite data downloaded from the gliders on their office computers, providing them with an invaluable real-time view of what is happening off the coast of Southern California. Moreover, as he and his research team have become familiar with the oceanographic patterns off the coast, they are actually able to make near-term predictions on the timing, location, and likelihood of toxicity in local algal blooms.



Top left: Diving glider (Photo credit: CINAPS). Bottom left: *Lingulodinium poledrum* (Photo credit: CINAPS). Right: Example of 3D imagery from the track of one glider depicting chlorophyll (i.e. a phytoplankton bloom) present along the Orange County coast (Photo courtesy of usclab.usc.edu).

The Next Big Step for Dr. Burton Jones: Professor of Marine Science in the Chemical and Life Sciences and Engineering Division and Red Sea Research Center, King Abdullah University of Science and Technology (KAUST), Saudi Arabia

On the east coast of the Red Sea in the city of Thuwal, Saudi Arabia, the King Abdullah University of Science and Technology (KAUST) is positioned to study the dynamic interactions of land, sea and air in the region. It is the first higher education institution in Saudi Arabia to allow women and men to mix freely, and ultimately hopes to have approximately 250 faculty and 2500 students. The school opened in September 2009 with a first class of 400 students. Faculty has been recruited internationally, with the greatest numbers from the United States, Germany, Canada, and China.

Dr. Burton Jones accepted a position, which began in January 2012, as Professor of Marine Science in the Chemical and Life Sciences and Engineering Division and Red Sea Research Center. Dr. Jones does not see this move as an abrupt end, but rather, as he always does, an opportunity for expansion and further collaboration. “The group at KAUST is small and does not have the breadth we had here, so I see an opportunity to develop collaborations with researchers at USC and in Southern California, as well as across the U.S. I don’t think of this as an end to my time at USC, but rather extending the family. I see this as a next step, building on everything we’ve accomplished here and moving it to a region that needs it.”



Sea Grant is a nationwide network--administered through the National Oceanic and Atmospheric Administration (NOAA)--of 32 university-based programs that work with coastal communities. The Sea Grant Program at the University of Southern California has served the Southern California coastal region since 1972, funding research, transferring results to government agencies and user groups, and providing information about marine resources, recreation and education to the public.

USC Sea Grant Contact Information
seagrant@usc.edu | 1.213.740.1961
<http://www.usc.edu/org/seagrant/>

USC Sea Grant Staff

- Linda Duguay, Ph.D., Director
- Phyllis Grifman, Associate Director
- Lyndell Whitley, Director of K-12 Education, Wrigley Institute for Environmental Studies
- Linda Chilton, Education Coordinator
- James Fawcett, Ph.D., Marine Transportation/Seaport Specialist, Extension Leader
- Juliette Hart, Ph.D., Regional Research and Planning Specialist
- Charlotte Stevenson, M.S. Science Communications Specialist
- Rick Hayduk, Information Technology Specialist
- Ruth Dudas, Office Manager
-

The Urban Mariner is written by Charlotte Stevenson, with editorial assistance from Juliette Hart and Phyllis Grifman and technical assistance from Rick Hayduk.