

Balearic beacon

Oceans of Change showcases the best of early career marine scientists

The second ICES/PICES Early Career Scientist Conference “Oceans of Change” took place on the Spanish island of Mallorca in April. More than 100 participants from 21 countries gathered over the course of a week to present their work and debate the future of marine science.

The impact of climate change, as well as that of humans, on the marine ecosystem was addressed and debated by keynote speakers and participants, and new technologies and strategies to address the prospect of a changing ocean were presented.

Here we present some of the thoughts of those that attended.

Ignacio Catalán, Senior Researcher IMEDEA and local host

I had the honour of acting as head of the local organizing committee for Oceans of Change. Hosting a scientific event of such strategic importance on a Mediterranean island that depends strongly on tourism is a benefit for the hosting country the value of which is difficult to estimate. In these difficult times, the [Mediterranean Institute for Advanced Studies](#) (IMEDEA, CSIC-UIB) can be proud of having contributed to fostering the future of marine science.

In my view, the success of the conference lay in the convergence of a few key factors: a good idea, enough funding, excellent science, an attractive setup, and an energetic group of people willing to combine all of these components. Additional salt and pepper came from the conference format: inexperienced local organizers, an inexperienced scientific committee, and inexperienced participants... but all of them eager to confer a dynamic and productive atmosphere. As local organizer, it was a pleasure (and a relief) to see that, from the first evening at the Castle reception, scientific interactions were quickly established.



The Oceans of Change opening ceremony was held at Castell de Bellver. Photo courtesy of Steve Barbeaux, NOAA.

The remarkably high level of science at the oral and poster sessions surprised me, although I knew that the Scientific Steering Committee (SSC), composed of young scientists, had a difficult selection task. Inundated with submissions, they unfortunately, had to reject four out of every five applications received. This in itself was a guarantee that the scientific contributions were well above average. Further, I found the keynote talks and workshop leaders to be excellent and the workshops stimulating.

The hours of productive and bonding discussions, through online meetings with the SSC, the ICES and PICES conveners (who wisely mentored us during the process), and the rest of the team (especially Søren, Görel, Vivian, and ICES Secretariat) provided the basis for a scientifically and personally rewarding final product. Well, maybe the Spanish weather and local food also played a role! Little did I think that this commitment might end in such an enriching learning experience for both my local colleagues and me. Thanks to all of you.



Beatriz Morales (Director IMEDEA CSIC-UIB) and Ignacio Catalán (IMEDEA CSIC-UIB) welcome participants to the conference. Photo courtesy of Natalia Martín, IMEDEA CSIC-UIB.

Renata Gonçalves is completing her PhD at the *Centre of Marine Sciences, Algarve University, Faro, Portugal. She works in the Guadiana estuary saltmarshes (southeast Portugal) and is particularly interested in the characterization of fish nursery functions of saltmarsh areas as well as functions, model development, integrating climate change, and anthropogenic disturbance scenarios in those areas.*



Oceans of Change 2012 was my first experience at an ICES/PICES event, and I can say it was a great experience. It gave me the chance to connect with researchers, not only from within my field of expertise but also from different scientific areas. This is always an enriching opportunity inasmuch as my perspective is that science should be built from the small pieces of a huge puzzle. As the conference was oriented towards early career scientists, I had the opportunity to meet young researchers that share similar problems and difficulties and discover interesting approaches to overcoming them.

Beyond the knowledge shared between participants through oral and poster presentations, there were workshop breakout sessions that addressed career advice for research scientists in communication, proposal writing, and attracting funding, so important for scientists in the first steps of their career. I was particularly enthusiastic about the workshop on Communicating Science. The speaker, Martin Pastoors, presented quite intuitive but frequently forgotten guidelines on how we can share our scientific findings with society in a more effective way. As he spoke on the distance between science and societal interests, I realized that, whereas society is more interested in hearing the bottom line from scientists' research (What does it mean? Why is it relevant? Why should we be paid for doing it?), we scientists often fail to communicate this to society, focusing more on the background knowledge than on the actual findings of our studies.

Finally, I would like to congratulate the organizing committee. I must say that it was one of the best scientific meetings I have attended. In addition to the high quality of work presented, the social activities (welcome reception, gala dinner, and offsite excursion) and facilities were also extremely enjoyable.



David Elliott received his PhD from the *Virginia Institute of Marine Science, College of William and Mary in 2010. He is an assistant research scientist at the *University of Maryland Center for Environmental Science, Horn Point Laboratory. His work focuses on the environmental determinants of variation in coastal mesozooplankton populations.**

As I write this, sitting more than 10 000 metres above the North Atlantic, it strikes me that as little as one week ago, the extent of my experience with ICES/PICES had been limited largely to the publications *ICES Journal of Marine Science*, *Progress in Oceanography*, and *ICES Zooplankton Methodology Manual* (pertinent to my specific expertise). Thus, while I was thrilled to have the opportunity to share my work and connect with fellow early career scientists at the Oceans of Change conference, I had little idea of what to expect. Happily, the entire experience was very enjoyable, from the initial welcome to the abundance of excellent science that was presented, to the gala dinner and departing words. Although I had been unable to sleep on my overnight flight to Europe, I found jet lag to be a triviality thanks to a consistently engaging scientific and social programme.

A line-up of excellent posters and talks depicted scientific works that compared favourably with anything I have seen at previous international conferences. In fact, about midway through the first full day, I found myself musing that a type of "natural selection" might be at work to explain such a preponderance of quality works. That is, perhaps limited funding in current economic settings has combined with an increase in the number of new scientists being produced to create an environment

where the science that we do must be top-notch and ever improving if we are to remain relevant. To me, it certainly seems a reasonable explanation for the wealth of good science that I was audience to during this last week. One thing is certain. The themes and topics that predominated at this gathering of early career ocean scientists, such as I saw this week, are by definition the ocean science of the future.

Chief among themes was an emphasis on scaling up; for example, from the level of the individual organism to the ecosystem or from regional to global scales. Such large-scale approaches to ocean science were advocated in light of the global nature of many environmental issues (e.g. accelerated climate change and eutrophication, ocean acidification, and overfishing). However, the consensus seemed to be that scaling up can and should be achieved without needless sacrifice of detail at smaller scales. Another major focus throughout the conference was on the importance of and approaches to communicating the relevance of our science to societal issues: in a sense, selling our science and advising society based on our best available research results, while at the same time being clear to communicate the level of uncertainty associated with advice. Above all, I saw that there was a sense of optimism in the face of the many challenges facing scientists during the coming generation. And why not? We have at our disposal an astounding and rapidly increasing array of new technologies for the acquisition and sharing of data, as well as for its analysis and eventual synthesis into globally relevant scientific research products.

Through these conference experiences, I have come to think that ICES/PICES occupy a very strategic position to help facilitate ocean scientists in addressing many of the problems of the future, including those mentioned above. I was impressed by the strong spirit of international and interdisciplinary cooperation at the conference and the importance afforded the role of science in serving societal needs. It was an honour to have been a part of the conference, and I look forward to future involvements with ICES/PICES.

Elizabeth Siddon is a PhD student at the University of Alaska Fairbanks, School of Fisheries and Ocean Sciences in Juneau, Alaska. She is interested in the effects of oceanographic variability on early life survival of marine fish and subsequent recruitment success of commercially important species. Her research focuses on both individual-based and community-level responses to environmental variability. She is interested in incorporating ecological knowledge into predictive modelling efforts to improve stock assessments.



“Thank you for that great talk”. This is the sentiment I took away from Oceans of Change. The quality of presentations continually impressed me as did the questions posed by my peers that fostered a broader view of individual research questions. The meeting has certainly set the bar in terms of conducting and presenting contemporary research as I look ahead to the next phase of my career.

In his concluding remarks, Adi Kellermann distilled a list of topics from the week’s presentations, many of which represented new directions of research since the first Early Career Scientist Conference in 2007. He, as well as I, was struck by the breadth of the talks throughout the week, with modelling, in some form or another, being omnipresent. This application of available time-series data was countered by several of the keynote speakers as well as the “New Tools and Views” session, which highlighted technologies that allow efficient sampling at both local and basin scales in order to detect changes in the marine environment.

I attended the conference to present a portion of my dissertation research, which focuses on the effects of climate variability on early life stages and recruitment success of marine fish. Listening to other talks throughout the week gave me a unique opportunity to see where my research fits in

among others' from around the world. I walked away rejuvenated and motivated to return home to the remainder of my dissertation (including a modelling study, of course!).

From the Opening Reception at the [Castell de Bellver](#) to the gala dinner at Son Termens, the Spanish island of Mallorca provided a scenic backdrop to an inspirational meeting. I feel fortunate to have connected with such an impressive group of young scientists, and I look forward to following their work and crossing paths again. I want to thank ICES/PICES for the opportunity to attend the conference and hope to see many of you at ICES Annual Science Conference in Bergen, Norway.



Robert Leaf is a post-doctoral scientist at the [Northeast Fisheries Science Center's Narragansett Laboratory](#) and is interested in the way that seasonal dynamics of temperature and productivity affect the recruitment dynamics of commercially important ground fish of the northeast continental shelf.

Although familiar with the work of both ICES and PICES through their many publications, I had never previously attended an ICES meeting. I was eager to attend this meeting in particular because of its unique format – an opportunity to meet and interact with a group of scientists with such similar education and professional experience. Of great value were the many opportunities to discuss life as a scientist with colleagues who were also at the crossroads of their careers: moving from student to professional. The quality of the science and scientific discourse carried the meeting, and I was not disappointed in this respect. The plenary sessions, seminars, and especially the talks by colleagues were very enlightening along with meeting so many international scientists, each bringing a different and unique perspective.

The conference took place in one of the most historically rich locations in the western hemisphere: The Balearic Islands have been a crossroads of culture for more than three millennia. The stark contrast of dry subtropical promontories dropping precipitously into the azure blue ocean provided the perfect backdrop to our experience.

I attended the conference to share the recent work that my supervisor Kevin Friedland and I had been working on. Primarily our work is concerned with understanding temporal or phenological dynamics of temperature and chlorophyll, and how these effect fish recruitment. Such temporal dynamics are determined, in part, by ecosystem conditions that can exhibit large intra- and interannual fluctuations. We hypothesize that interannual changes in primary production and temperature will have important consequences for species at higher trophic levels. We were excited to share the results of our work because the best science is the result of seeking criticism and input, and this was one of the first opportunities that we had to do this. I was not disappointed – the questions I received after my talk and the email correspondence that continued after the conference has helped to refine my understanding of phenology and also to be introduced to a wide range of people with experience in this field. It has been, and continues to be an incredibly enlightening experience.

I felt very fortunate to attend the plenary sessions of the meeting and felt that one talk in particular was very powerful. The rigour and quality of science was set very high on the first day when Akinori Takasuka presented his work on the mechanisms for population fluctuation in pelagic fish as a response to environmentally mediated growth. The talk was fascinating in that Takasuka very concisely and elegantly demonstrated a mechanism for why a pelagic prey species undergoes such pronounced changes in abundance. It is rare to see work that, though parsimonious, has such great explanatory power and relevance. This topic is relevant on many scales, not least of which is the recent rise in the concern about the importance of “forage fish” dynamics and their top-down controls by fishers. A very thought-provoking talk indeed.

Julie Rose, NOAA, highlighted the measures that her group is undertaking to understand how aqua-

culture technologies and methods may help to ameliorate anoxia in Long Island Sound. This fascinating talk resonated with me because of its multidisciplinary nature and technological innovation. Bringing scientific expertise to bear on these societal problems is admirable and necessary. Rose's presentation energized the audience and illustrated the utility of science for addressing real-world problems.

On the final evening, conference participants attended a gala dinner which provided a wonderful opportunity to discuss science, our lives in science, and our goals for future work. Beginning with drinks on the deck of a country manor overlooking pastoral inland Mallorca, the evening was filled with stimulating conversation and plans for future collaborations. As I reminisce from my office, I have more emails from new colleagues met just a few weeks ago, new ideas to pursue, and new research directions to investigate.



Left: Participants mingle at the conference welcome reception. Photo courtesy of Steve Barbeaux, NOAA. Right: Kirsten Redmond, University of Stavanger, talks about oil spills and real-time environmental monitoring with whole organisms. Photo courtesy of Natalia Martín, IMEDEA CSIC-UIB.



Left: Local hosts Beatriz Morales (IMEDEA CSIC-UIB) and Joaquin Tintoré Subirana (IMEDEA CSIC-UIB) speak with conference conveners Adi Kellerman (ICES) and Skip McKinnell (PICES). Right: Participants enjoy the Poster Session. , USA. Photos courtesy of Natalia Martín, IMEDEA CSIC-UIB.

Best Presentations

Impact of Change on Marine Ecosystems theme session: [Kristy Kroeker](#), *Ocean acidification affects recruitment and competition in benthic communities surrounding natural CO₂ vents.*

Human Interactions with the Marine Environment theme session: [Jameal Samhouri](#), *Risky business: linking land- and sea-based activities to risk in coastal ecosystems.*

New Tools and Views in a Changing Ocean theme session: [Robin Kodner](#), *Phytoplankton in a Changing World: What we can learn from Metanomics Technologies.*

Best Poster

[David Nicholson](#), *Dissolved gas tracers as new constraints for ecosystem-biogeochemistry models.*

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