ECSA Bulletin

Bulletin of the Estuarine & Coastal Sciences Association

Normandy Coast

The ECSA is an international society dedicated to the scientific study & management of estuaries and other coastal environments

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BULLETIN No. 59

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with thanks to all contributors.

Editorial ECSA 59

As part of natural sciences, marine ecology is concerned with « nature ». But what is nature? If it has ever existed since civilization evolved, can one still find it somewhere on planet Earth? Have not the human influences reached even the most remote parts of the biosphere? So, the natural world might have disappeared for ever from our environment.

The appeal of nature (or even more vividly "wilderness") is a recent development. Until recently nature was considered treacherous and threatening to humans. It seems to be a miracle that our ancestors managed to survive huge and fierce predators which, day and night, endangered their life. Living in hostile surroundings, they not only had to protect themselves against other competitive species but also fought among themselves, making "natural" selection rather benign in some instances.

Such a concept is far from 18th century philosophy. Did not Jean-Jacques Rousseau imagine an ideal primitive and natural world? According to the French philosopher, human society had spoilt what Eden was at the origin of the world. Later in the 20th century, a Sand County Almanac by Aldo Leopold combined some of the finest nature writing since Thoreau with an outspoken and highly ethical criticism of America's relationship with its terrestrial environment. Written with an unparalleled understanding of the ways of nature, Leopold expressed a passion for the sublime and the primitive. This passion is still vivid in the memory of our present global civilization. However, with the emergence of positive thinking, just when Leopold was enjoying the beauty of naturalness, the world was visualized as a machine: humans had to make it work more effectively and exploit it. By the end of the century, the US-based French philosopher Jacques Baudrillard considered wilderness to be rejected by from society. Land of no interest to developers and managers could be left to wild animals and plants as long as they did not interfere with economic development. Only privileged wealthy eco-tourists would be interested in wild environments with their campaigning for restoring naturalness and saving endangered species at selected "hotspots". To them, nature became a refuge from overpopulated and polluted cities. Consequently, through the promotion of natural theme parks (e.g. "Nature Land"), nature became a consumable product.

As scientists, where do we stand with regard to wilderness and the natural world? Should restoring damaged habitats consist in excluding humans in order to leave wild species to recover possession of what was rightly theirs? In other words, should nature exclude humans? As ecologists, we know that humans are part of nature. For modern anthropologists such as Tim Ingold of Cambridge University, humans are indeed inseparable from nature. His 'dwelling perspective' views humans as "immersed from the start, like other creatures, in an active, practical and perceptual engagement with constituents of the dwelt-in world". The irony is that, actually, nature often looks better when it is artificial, at least through human eyes. Then, should the objective of environmental management be to safeguard the environment or make it suitable to human life? What is wilderness to the ecologist? Could this notion help scientists propose scenarios for restoring damaged ecosystems? Is wilderness something we, humans, should crave for? The definition of wilderness, as given in modern dictionaries indicates seemingly conflicting messages:

(1): a tract or region uncultivated and uninhabited by human beings - b: an empty or pathless area or region c: a part of a garden devoted to wild growth

(2): an area essentially undisturbed by human activity together with its naturally developed life community

(3) a: a confusing multitude or mass - b: a bewildering situation

There is much more to the concept of wilderness than these definitions. This is because "wilderness" is a human construct. The wilderness concept only exists in the minds of humans. Wilderness was frequently referred

Photo: J-P Ducrotoy

Etretat

to in literature of the Judeo-Christian tradition. It was typically described as a barren place, devoid of human value, except in the context of spiritual purification and renewal. Considering the dry, sparsely vegetated lands of the Middle East, it is understandable why wilderness was not considered a hospitable place... But the biblical writings and descriptions in literature of wilderness areas as forbidding places had an influence on how the religious colonists of the New World viewed the wilderness with which they were confronted. The more common conception of wilderness, at least in Western and industrialized societies, is of wilderness as physical places where the forces of nature have evolved relatively uninfluenced by humans (e.g., in the US Wilderness Act of 1964).

Is it necessary to recall that ecology is a science, it being a component of biology? Ecologists were the first to understand that coherence in food webs was necessary for an ecosystem to function. So, early on, they understood what biodiversity was doing for the biosphere. In the 1980s, half hidden protests soon appeared in academic papers. Some unscrupulous colleagues soon realized that they could get financial backing if they played a politically correct ball game. Commerce and ethics were part of the race for funding and a new philosophy emerged: it is now well accepted in the academic world for mass-media-sensitive scientists to earn celebrity and cash in selling "good" science. Garnering a world-wide catastrophe was what the media wanted to hear.
Big money was at stake. Succeeding in one's career was not only contributing to improving knowledge but more and more building financial empires and collecting money from all sources.

What is the future of science, then? Global change is taking place at a more rapid pace than previously forecasted. People were made guilty for destroying their only planet but scientists have now come up with a rescue package: only robust science can save the world. What sort of jaw-dropping research will now appeal to the media? Let us not forget the holistic view adopted by Haeckel in 1935 which led him to propose the ecosystem concept. Closer to us, the new millennium has brought interdisciplinarity with it. As nature cannot be contemplated without humans meddling in its operation, let us bring in more social sciences and put our work in an economic perspective. Here is a challenge still to be seized by ECSA.

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Consequences, Science and Art

The ECSA Constitution, which is downloadable from your new website:

http://www.ecsa-news.org/

states that 'the President of the Association shall be elected annually at the Annual General Meeting (AGM) provided that he or she shall not hold office for more than three consecutive terms'. Well, to my amazement, the three consecutive terms are now complete. Next week we will have our AGM during the Oban Local Meeting on 'Scottish Sea Lochs and Adjacent Waters':

http://www.smi.ac.uk/sealochs/

and it is at this meeting that the new President will be elected. Therefore, with a tinge of sadness, this is my last 'View from the Chair'.

Looking back over the three years, a number of marine-related events remain in my mind, both for their impact at the time and for their subsequent, longer-term consequences. As an aftermath to the terrible Japanese tsunami, we hear of the US coastguard's sinking of a disowned Japanese fishing vessel (which was swept out to sea by last March's tsunami); this was done rather than allow it to float in busy shipping lanes between North America and Asia. The tsunami, which killed almost 20,000 people, generated huge amounts of wreckage, some of which has already come ashore on the northwest US coast and, however unlikely it may be, there are fears by some people that a fraction of the debris could be contaminated by the tsunami-associated accident at the Fukushima Daiichi nuclear power plant. One year after the disaster, the search for bodies still continues, and areas in the prefectures of Iwate, Miyagi and Fukushima that were strewn with destroyed houses, interspersed with ruined cars and boats carried along by the flooding waters, are now empty spaces. Adding to the misery, there are a third of a million people who are still living in temporary accommodation.

Two years after the Deepwater Horizon oil-spill disaster in the Gulf of Mexico, BP and the US authorities remain in discussion over how much should be paid by BP in damages, although it is still not known what long-term effects the biggest offshore oil spill in US history will have on the Gulf's ecosystem. Over the last two years, numerous dolphins have been washed-up on the Gulf's shores and this, and many other aspects, will be used in the process of deciding the cost to BP of restoring the damaged environment and its wildlife and in compensating those people whose livelihoods have been detrimentally affected.

Anxieties about the consequences of ocean acidification continue to mount. A study by Bärbel Hönisch et al., published in *Science*:

http://www.sciencemag.org/content/335/6072/1058.abstract/

found that there has been only one previous occasion (when the seas experienced a benthic foraminiferal mass extinction) for which the rate of acidification remotely resembled the current rate, although today's acidification is, amazingly, occurring 10 times faster than that of the Palaeocene-Eocene Thermal Maximum (PETM) of 56 million years ago. Over the past 100 years, rising atmospheric carbon dioxide has led to a 30% rise in acidity and it is estimated that the increase in ocean acidification since the Industrial Revolution will, at the end of this century, match the acidity changes that occurred during the PETM.

Nevertheless, on the small scale there is some heartening news. I was interested to learn of the collaboration between the fishing industry and conservationists in the newly created Ramsey marine nature reserve off the Isle of Man in the Irish Sea. The overlapping interest concerns

the progress that scallop populations have made in the area since it was closed to fishing in 2009:

http://www.irishsea.org/marine-protected-areas/isle-of-man/

In a new and encouraging arrangement, fishermen and scientists co-manage the 90 km2 reserve, and whilst the eel grass meadows and maerl beds are no-take zones, and subject to regular monitoring, a lease for the scallop fishing area is being given for 'responsible' fishing. Much of this cooperation has come from efforts to build wider support for marine conservation through the holding of regular public events.

Another new and interesting idea is the proposal of mobile marine reserves. It has been suggested that protected areas of the ocean, where commercial fishing is banned, would work better if they were not static conservation areas, as they are at present, but moveable reserves that take into account the mobile nature of sea life. It is thought that this could prevent the indiscriminate slaughter of vast numbers of turtles, sharks, albatrosses and other endangered marine animals that fishermen currently capture as 'by-catch':

http://www.bbc.co.uk/news/science-environment-17070993

On an artistic note, I wonder if you have seen Michael Marten's photographs of British beaches and other intertidal areas at high water and low water. Tidal ranges in water levels around the British and northwest European coasts tend to be high, e.g. there is a 12 m mean spring tidal range at Avonmouth in the Severn, so that large intertidal areas are common here. However, while we are all interested in the near-shore environment and in the intertidal areas that are uncovered and covered with each tide, Michael Marten has managed to put together a sequence of high-water and low-water photographs that show us what we see in passing and already know from memory, but never see in synthesis. If you have not seen them, I recommend you take a look at his excellent photographs via:

http://www.lensculture.com/marten.html

On a grander scale, and in my mind's eye, I have often tried to visualise (but not paint) the landscape that once existed across the Plymouth Sound and its estuaries of the Tamar and Plym in Southwest England when sea level was 100 m lower than its modern level (roughly 17.5 ka before present). The Tamar system was a river valley, which became a

ria with rising sea levels, and the lower Plym River occupied a limestone gorge near what is now the city of Plymouth. Of course, there are strong links between photography, art and science; Van Gogh, the great Dutch painter, wrote to his brother Theo: 'The duty of the painter is to study nature in depth and to use all his intelligence, to put his feelings into his work so that it becomes comprehensible to others'. This, of course, is what we strive to do with our science and with our efforts to publish our work in the peer-reviewed literature and to present our work at conferences. Over the many years since ECSA was formed, we can rightly claim that we have striven to act as the catalyst for those ideals, through our numerous publications, workshops and international and local conferences.

ECSA is in good health as I leave the Presidency. Our new website is a vast improvement on the old one – although your suggestions and comments for further improvements are, of course, always welcome – and we have an impressive programme of international and national conferences planned for the future. Next month (3rd – 7th June 2012) sees our landmark 50th ECSA Conference in Venice, Italy: 'Today's Science for Tomorrow's Management', which promises to be a hugely successful meeting that also should gain many new members for us. This conference has been undertaken jointly with Elsevier, who publish our journal 'Estuarine, Coastal and Shelf Science', and, hopefully, will be the first of many such conference collaborations with them. Next month (26th – 28th June 2012) also sees our ECSA Workshop on 'Macronutrients' taking place at Plymouth University, UK. There are many other things to feel pleased about too on ECSA's behalf, including the marked increase in grant applications that we are receiving, although I will leave these for the new President to tell you about. But, before stepping down, I am looking forward immensely to our Local Conference next week in Oban, Scotland. So, I wish you all well and look forward to serving you and our science through ECSA in other ways.

Oh, by the way, enjoy the London 2012 Olympics – I've seen one of the 'London Prepares' events in the Olympic Stadium and the 'real' thing is going to be fabulous!

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Plymouth from Drake's Island - Photo: Reg Uncles

Report of the 41st Annual General Meeting

The 41st Annual General Meeting of ECSA was held on Thursday 17th May 2012 in the John Murray Building, Rooms 1 & 2, Scottish Marine Institute, Oban, Argyll, PA37 1QA, Scotland, UK. As in previous years, it was scheduled during a stimulating ECSA local meeting, which this year focussed on Scottish sea lochs and adjacent waters.

The meeting opened at 13:00 with the ECSA President, Reg Uncles, welcoming attendees and taking apologies. The minutes of the 40th AGM were accepted without changes and the President then asked for reports from the Secretary and Treasurer.

Secretary's Report

Mark Fitzsimons noted that his first year as ECSA Honorary Secretary had been very interesting and enjoyable. He noted that ECSA has made further progress in improving its profile to the international community, and embedding its operational structures to ensure that Council operates as effectively as possible for members.

ECSA continues to organize local (in several countries) and international meetings that receive a high profile, often associated with special issues of related publications (e.g. ECSS). The ECSA Conference Co-Ordinator is, as ever, working hard to ensure that ECSA is in demand for hosting and co-hosting of meetings, so many thanks to him. A new concordat has been approved by Council to clearly define what ECSA will offer to, and expect from, organisers of international meetings where ECSA involvement is desired. 2011: Grahamstown, SA; 2012: Venice; 2013: Shanghai. In addition, Sed-Net links have been created with a possible joint meeting for 2013 (inter-disciplinary).

The ECSA website has been completely redesigned in the last year and is now much more informative and easier to navigate. Members are invited to visit the site (**www.ecsa-news.org**) and feedback comments and make contributions (contacts available on site).

There is now a student rep. on ECSA Council, Dr Sally Little, with a brief to canvas opinion and come up with ideas for widening student membership of, and participation in, ECSA. She has produced a valuable report that will be taken forward by Council. A proposal for the AGM is a 3-year membership subscription for students (lifetime of studentship) so that they can stay in contact throughout this time, and hopefully continue as full members.
There are a number of motions which the ECSA Council will present to members today including:

1. Proposal to create the position of President-elect so that Council can plan succession effectively, also requiring a change in the wording of Clause 10 (1).

2. A proposal to make a small increase in the annual membership subscription to increase the ability of ECSA to serve its members.

Six applications were received by the deadline of 1 April 2012, five of which were supported. This is very positive and will hopefully raise the profile of ECSA. Funding support was requested for attendance at ECSA Venice meeting, ECSA Nutrients Workshop and a non-ECSA workshop. The recipients will be required to produce a report of their activities which will appear in a future edition of the ECSA bulletin.

Treasurer's Report

Martin Wilkinson presented the past year's financial details of ECSA operations for members to consider. He made the point that expenses for ECSA had increased, highlighting the need to expand sources of income and to

Scottish Marine Institute, Oban, Argyll, Scotland

further develop those already in place. He has introduced Paypal as a means of direct payment for those renewing or applying for membership, and this can now be accessed from the ECSA website. ECSA investments have been stable but are not producing a substantial dividend, in line with the general economic climate. He mentioned that the possibility of gift aid had been discussed with the UK tax authorities and that ECSA would now proceed with proposals to utilise this opportunity, with the possibility of an annual award funded from the source being one idea. Membership was steady but many members were joining for one year only, concurrent with a meeting of interest, so continuity of membership was an area that required improvement, with some ideas already progressing (e.g. 3-year membership for research students).

The President then put the motions to the vote

1. **Proposal to introduce a 3-year student membership subscription of £30**

   Proposer: Martin Wilkinson; Seconder: Mark Fitzsimons
   Votes for: 10; Against: 0
   This motion was passed.

2. **Proposal to increase annual ECSA membership subscription to £35/36**

   Proposer: Mark Fitzsimons; Seconder: Geoff Millward
   Votes for: 10; Against: 0
   This motion was passed.

3. **Proposal to alter clause 10(1) of the ECSA constitution:**

   Existing Clause 10 (1): The officers of the Association shall be a President, Secretary and Treasurer, all of whom shall be ex-officio members of the Council and such committees and sub-committees as may be duly appointed.

   Proposed Clause 10(1): The officers of the Association shall be a President, President-elect, Secretary and Treasurer, all of whom shall be ex-officio members of the Council and such committees and sub-committees as may be duly appointed.

   Proposer: Martin Wilkinson; Seconder: Reg Uncles
   Votes for: 10; Against: 0
   This motion was passed.

A list of Applications for Membership was then presented to the AGM and approved. It was noted that the number of new members (62) was very encouraging.

The election of Officers and Council then took place

Election of President: G. Millward (proposed by M Wilkinson seconded by Reg Uncles)
Elected unanimously

At this point the new President, Geoff Millward, took over as Chair of the AGM, and thanked Reg for his sterling work for ECSA over that past 3 years.

Election of President-elect: Kate Spencer (nominated Martin Wilkinson, seconded Clare Scanlan)
Elected unanimously

Election of Secretary: M. Fitzsimons (proposed by Martin Wilkinson seconded Clare Scanlan)
Elected unanimously

Election of Trustee: Reg Uncles (proposed Mike Elliott, seconded Anita Franco)
Elected unanimously

Elections to ECSA Council:

Teresa Fernandes – nominate (currently co-opted) [proposed Axel Miller, seconded Sally Little]

Steve Mitchell – nominate for second term [proposed Richard Whitehouse, seconded Axel Miller]

Ruth Callaway – nominate [proposed Andrew Wither, seconded Kate Spencer]

Jean-Paul Ducrotoy – has served 2 terms so needs to be co-opted for 2012-13 [proposed John Pomfret, seconded Sergia Costa Dias]

Patrick Meire - nominate [proposed Victor de Jonge, seconded Jean-Paul Ducrotoy]

All elections and co-options to Council were accepted unanimously.

Election of Honorary Auditor(s).
Alastair Lyndon was elected for a further year.

Thanks were again extended to Reg Uncles for his work as President.
The President then closed the meeting at 14:10.

Enjoying a good meal in Oban after the AGM

A new President for the Association

Professor Geoff E. Millward
GRIC, MSc, PhD

Geoff Millward was elected President of ECSA at the last AGM in Oban (Scotland) in last May. Geoff obtained his Graduateship of the Royal Institute of Chemistry in 1966 by part-time study, while working at the British Rail Research Laboratories at Derby and Doncaster. His PhD study, at the University of Keele, involved high temperature gas phase reaction kinetics of relevance to rocket propulsion. In 1970, he emigrated to Canada where he undertook a postdoctoral study, at the University of Calgary, on the thermal stability of fluorochlorocarbon compounds used in the manufacture of heat shields for hypersonic flight. He moved to Cornell University, New York, where he continued his research in high temperature gas phase combustion funded by a NASA contract. When NASA announced the termination of the "Apollo" programme and he returned to the UK with the intention of re-aligning his research field.

He entered the Oceanography Department at Southampton University, where, as an MSc student, he studied the behaviour of mercury in seawater, which gave him an opportunity to transfer his knowledge of kinetics and mechanisms into the aquatic field. In 1974 he was appointed as a lecturer in Plymouth Polytechnic, where he has been ever since. Over the past 38 years much of his research has concerned reaction kinetics in aquatic systems, mainly involving particle-water interactions, as well as being involved in major thematic programmes, such as the North Sea Project, the Land-Ocean Interaction Study (LOIS) and Environmental Diagnostics. In 1989 he was presented, by Her Majesty the Queen, a Churchill Silver Medal for his work on the North Sea. In 2004 he chaired a Workshop on "Background Concentrations for Natural and Xenobiotic Substances" for the Oslo and Paris Commissions (OSPAR).

Currently, he is Emeritus Professor of Marine Chemistry in the Marine Institute of Plymouth University and is Technical Director of the ISO9001 accredited Consolidated Radio-isotope Facility (CORiF). His research concerns environmental radioactivity with an emphasis on aquatic contamination by radionuclides and their uptake and impact on marine organisms. He holds a Visiting Scholarship to Thailand funded by the Scientific Committee on Ocean Research (SCOR).

Welcome to Geoff in his new role in the Association

New Book Series in Environmental Sciences

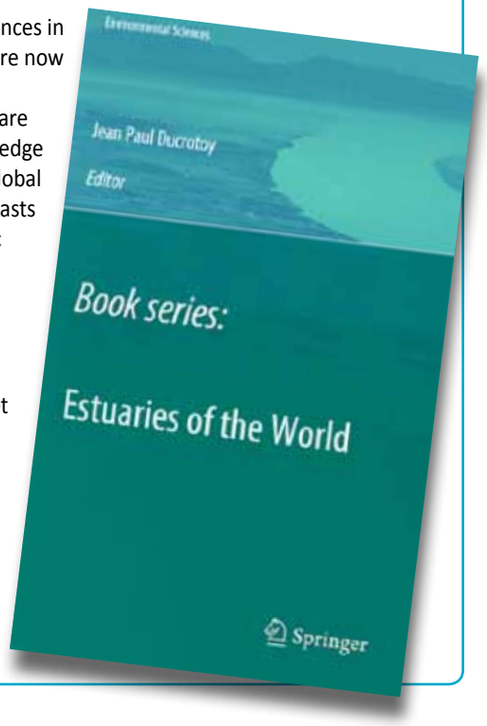
Estuaries of the World

Series editor: Jean-Paul Ducrotoy, Institute of Estuarine and Coastal Studies, the University of Hull, U.K.

About the series

Estuaries are amongst the most endangered areas in the world. Pollution, eutrophication, urbanization, land reclamation; over fishing and exploitation continuously threaten their future. The major challenge that humans face today is managing their use, so that future generations can also enjoy the fantastic visual, cultural and edible products that they provide. Such an approach presupposes that all users of the environment share views and are able to communicate wisely on the basis of robust science.

The need for robust science is pressing. Over the last decade there have been numerous advances in both understanding and approach to estuaries and more and more multidisciplinary studies are now available. The available scientific information has come from a multiplicity of case studies and projects local and national levels. Regional and global programs have been developed; some are being implemented and some are in evolution. However, despite the rapidly increasing knowledge about estuarine ecosystems, crucial questions on the causes of variability and the effects of global change are still poorly understood. Although the perception of politicians and managers of coasts is slowly shifting from a mainly short-term economic approach towards a long-term economic – ecological perspective, there is a need to make existing scientific information much more manageable by non-specialists, without compromising the quality of the information.



The book series includes volumes of selected invited papers and is intended for researchers, practitioners, undergraduate and graduate students in all disciplines who are dealing with complex problems and looking for cutting-edge research as well as methodological tools to set up truly transversal science and technology projects, such as the restoration of damaged habitats.

Forthcoming titles under consideration

- Estuaries of Australia in 2050 and beyond.
- Geological Evolution of the Yangtze Delta, China: Nature and Human Use
- Estuaries of North-West Russia
- Water Quality in the Chesapeake Bay, USA

Forthcoming International Symposia

2012

2012 ECSA 51

Klaipeda, Lithuania

23 - 27 September 2012

“Research and management of transitional waters”

Organiser: Arturas Razinkovas, Coastal Research and Planning Institute, Vilnius, Lithuania

ECSA 51st symposium will be co-organized by the Coastal Research & Planning Institute of the Klaipėda University, BALLOON (Baltic Lagoon research Network) and EUROMEDFED (Euro-Mediterranean federation of coastal lagoons and transitional water bodies)

Venue: Campus of the Klaipeda University, H. Manto 84, Klaipeda, Lithuania

The term “transitional waters” are defined as “bodies of surface water in the vicinity of river mouths which are partially saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows”. These areas are considered diverse, highly productive, ecologically important systems on a global scale and highly valuable for the services they provide to human societies since at least the Neolithic times. The aim of this symposium is to get to the bleeding point of interdisciplinary scientific research carried out and to get the contemporarily insight on the conservation, restoration and management problems in these systems. The involvement in the organization of conference of both Baltic (BALLOON) and European and Mediterranean (EUROMEDFED) lagoon research networks brings a special focus to the European lagoons. The conference is also proud to receive support from the South Baltic Programme “ARTWEI” project dealing with the transboundary aspects of lagoon and transitional waters management in the Baltic.
Selected conference presentations are expected to be published in “Estuarine Coastal and Shelf Science” and “Transitional Waters Bulletin” journals.

Information: http://www.corpi.ku.lt/ecsa2012/

2012

2012 ECSA 52

Leeuwarden, The Netherlands

21 - 23 November 2012

“An integrated approach to emerging challenges in a World Heritage Site”

Theme: 13th International Scientific Wadden Sea Symposium

The Symposium will be organized by the Wadden Academy in co-operation with the Common Wadden Sea Secretariat, the Ministry of Economic Affairs, Agriculture and Innovation, the Delta Program Wadden, Knowledge for Climate and the Estuarine and Coastal Sciences Association.
The Symposium will bring together scholars from various disciplines, managers and policy makers interested in the Wadden area in Denmark, Germany and the Netherlands plus comparable areas in other places of the world.

Seen the venue, the number of participants is restricted to 250.

The focus is set to four themes:

- **Climate and Water;**
- **Biodiversity;**
- **Sustainibility and Ecosystem Services;**
- **Science for Policy**

Each theme will consist of invited key-note speakers, case studies and poster presentations.

Organiser: Wadden Academy in co-operation with Common Wadden Sea Secretariat, Ministry of Economic affairs, Agriculture and Innovation and ECSA.

Publication: Ocean & Coastal Management/ OCMA

2013

2013 ECSA 53 – Elsevier - SKLEC

Shanghai, China
13-18 October

"Estuaries and Coastal Areas in Times of Intense Change"

covering:

- **Environment challenges: water quality, sea level rise, reduced sedimentation input from the catchment, etc.**
- **Dynamic geomorphology and sedimentation,**
- **Estuarine Wetlands**
- **Biogeochemical cycles of bio-relevant materials from land and sea**
- **Eutrophication, oxygen depletion, and harmful algal blooms**
- **Advanced techniques for monitoring estuarine and coastal change**
- **Economic growth and Ecological risks**
- **New strategies for developing policies integrating socio-economic needs and ecological values with social-cultural heritage**
- **Strategies of estuarine management**

Organiser: Prof Dr Xiuzhen Li
State Key Laboratory of Estuarine and Coastal Research

Local UK Meetings

2013

"Problems of small estuaries"

02 - 12 April 2013

Venue: Swansea University, UK
Organiser: Dr Ruth Callaway

In 1976 scientists met at the University College of Swansea to discuss issues affecting the Burry Inlet (South Wales) and other small estuaries. It was a gathering of geomorphologists, hydrologists, fisheries experts, biologist and governmental managers. They published their findings in the book "Problems of a Small Estuary" (1977, Eds A.Nelson-Smith & E.M.Bridges). Since then much has changed. This meeting will explore developments in the past 40 years and current problems and challenges for small estuaries.

ECSA Co-Sponsored Meetings

Centre de la Mer, Aber Wrac'h, Bretagne, France
(late September 2012)

"Land-Ocean Connectivity - from a Hydrological to Ecological Understanding of Groundwater Effects in the Coastal Zone"

Organisers: Thomas Stieglitz (France), William C. Burnett (USA), Makoto Taniguchi (Japan), Carlos Rocha (Ireland), Henry Bokuniewicz (USA)

Proposal for a GIS Europole Mer Gordon-like research conference in 2012
The coastal zone, where fresh and saltwater meet, hosts some of the most dynamic, diverse and productive ecosystems on Earth. These ecosystems experience significant pressure from human activities, responding to direct and indirect human disturbance and to climatic-hydrologic variability. Hydrological land-ocean connectivity is an important driver of these ecosystems. It greatly affects coastal ecosystem processes such as nutrient cycling, algal and zooplankton community dynamics, ecosystem metabolism or food web dynamics. The critical role of surface water discharge from rivers to coastal ecosystems has been well documented. In the past decade or so, the hidden subsurface flow of coastal (intertidal and submarine) groundwater discharge and associated geochemical and hydrological processes have received an increasing amount of scientific attention. However, the effects of groundwater flow on productivity, composition, diversity and functioning of benthic and pelagic ecosystems along the world's shorelines are not well understood. At a recent special session and Emerging Issues Workshop on future coastal groundwater research at the 2010 ASLO conference in Santa Fe, a better understanding of the ecological effects of groundwater flow was considered a major knowledge gap.

See also web site http://www.ecsa-news.org/

Contact for further information v.n.de.jonge@planet.nl

Photo: J-P Ducrotoy

La Rochelle

Photo: J-P Ducrotoy

Hamburg

To chair or not to chair....

Some weeks prior to the recent ECSA 50 conference in Venice, I received an email from the organisers asking if I would be interested in chairing one of the conference sessions. Having attended several conferences before, as well as having presented before, I had a reasonable idea of the job of a session chair but was nonetheless sceptical to my own ability as a PhD student to do the job. I just felt too inexperienced – chairing an ECSA 50 session would be my first time. It seemed daunting to have to introduce speakers with difficult-to-pronounce names, keep the time and stand in front of the whole room and speak. I chose to decline the offer. Luckily for me, Mike and the organising team were rather insistent that I give it a go, and I eventually agreed.

The session I chaired was in the afternoon after giving my own talk, so it made for a busy day. I presented a paper introducing some new methods using whole-organisms for real-time environmental monitoring, in the session on pressures and indicators, and anthropogenic change. Once I had finished my own presentation, it was easier to focus on the assignment of chairing a session, and my nerves disappeared. As a session chair, it was insightful to talk to the speakers before their talks, and learn that all the questions I often asked before speaking were not so unusual after all. And you fast learn that people don´t mind if you mispronounce their name a little bit. I was given a broad and interesting session to chair, with topics ranging from modelling and ecosystem services, to open/closed estuaries, to the interaction between algae and settling rates of mussels. I felt that both the variety of the papers presented in the session and the quality of the talks reflected the general atmosphere and standard at the ECSA 50 conference.

I would highly recommend that any young scientists offered the chance to chair a session for the first time take the opportunity, independent of how advanced in their scientific career they are. I found chairing a session gave me a new insight into how conferences work and allowed me to talk with people I perhaps wouldn´t have encountered otherwise. I think it will have also given me more confidence next time I give a talk myself. It was a highly rewarding experience, and I would definitely do it again. I would like to thank ECSA for giving me the opportunity in Venice.

Kirsten Redmond
PhD Student
University of Stavanger & BiotaTools AS

Calling all students - why join the ECSA?

You may ask yourself, why should I join the Estuarine and Coastal Sciences Association? Your research focuses on an aspect of estuarine science, but you probably think you don't have time to join; you have fieldwork to organise, a thesis to write, deadlines to meet and those all-important publications to dust-off and complete. If you need help or advice you just ask your supervisor and interacting with your peers amounts to desperately hoping they don't ask the difficult questions following your conference presentation. The reality of it is joining the ECSA is time and money well spent. The student fee is a 'drop in the ocean' compared to what you get out of an ECSA membership.

As an ECSA student member, for only £11 a year (or £10 by bankers order and paypal) you will receive:

- The ECSA Bulletin twice yearly
- The e-newsletter thrice yearly
- Discounted subscription to the top quality journal Estuarine, Coastal and Shelf Science
- Discounted registration fees for regularly organised events including:
  - ECSA-related conferences
  - Local meetings
  - Specialist workshops
- Exclusive access to ECSA funded grants

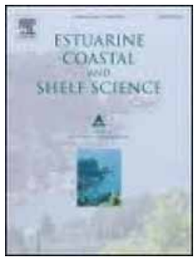
But most importantly joining the ECSA will help you with your career, whether it is in academia, consultancy or any other form of estuarine and coastal work.....

The key is networking

The key to belonging to an association is networking with your peers. The ECSA is at the forefront of excellence in estuarine science and has an international following. It has been involved in the organisation of over 50 conferences to date, averaging one or more a year, which student members can attend at a reduced registration rate. This year, the 50th ECSA international conference took place in Venice (3–7 June 2012), which will be swiftly followed by the 51st conference in Lithuania (23-27 September, 2012) and the 52nd in The Netherlands (21 – 23 November, 2012). Situated in exotic locations, these conferences and meetings not only provide the opportunity to present your research to fellow scientists who share a common research interest and meet other estuarine and coastal researchers, but it could also be the beginning of a research idea, collaboration or even job opportunity.

Take responsibility for your career progression

One of the most important parts of being a scientist is the need to stay up to date in your research area, through both the knowledge of recent publications and undertaking training workshops. In addition to reduced rates to attend ECSA related conferences, student members are also entitled to discounts on the subscription to the journal Estuarine, Coastal and Shelf Science and other ECSA-related scientific publications, as well as discounted registration fees for ECSA workshops, run by internationally-recognised researchers. In addition, the ECSA have various grants for which members can apply, including travel to conferences (to undertake presentations), travel for small research projects and attendance at training workshops, of which preference is given to student members. ECSA grants also include work by individuals for small research projects (e.g. during summer holidays).



Bulletins and newsletters provide useful information

As a student member, you will receive the ECSA Bulletin twice yearly and an electronic newsletter three times yearly. The bulletins contain information, short articles and reports on current, and in process state-of-the-art estuarine research, news on upcoming meetings, conferences and workshops, book reviews, ECSA grant information and council reports. The ECSA e-news keeps the ECSA community up to date on events, courses, fellowships and job positions.

We need your help

As a student, you may not yet have decided what career path you want to head down once you graduate, but if by specialising and undertaking research in estuarine science you enjoy what you do, then here is your chance to help out and be more interactive within this community. The ECSA is a non-profit charity run by a council made up of internationally-renowned estuarine scientists. By becoming a member, you not only receive all the membership benefits outlined above, but you also help support the ECSA. The ECSA is 41 years old, and has been evolving since its inception as the Estuarine and Brackish-Water Sciences Association in 1971. The ECSA council now believe that in order to maintain the society's evolution and progression, it is necessary to bring in new ideas and concepts, particularly from YOU, the next generation of estuarine and coastal scientists.

Developing a community of early career estuarine researchers

This is where you come in.

We need your help to develop a community of early career researchers (from undergraduate to postdoctoral) from a variety of backgrounds/ disciplines within estuarine science (e.g. ecology, biology, archaeology, geology, sedimentology, geomorphology, contemporary, palaeo etc). We believe that developing a community consisting of the next generation of estuarine scientists will bring new ideas and energy to the ECSA, which can only be beneficial to the association. We also want to widen our scope to attract scientists from different backgrounds that are currently under represented and develop our reputation as a truly interdisciplinary society.

To enable early career researchers to meet, socialise and network through research groups, we are constructing a discussion forum on our website and have created a facebook group (ECSA – Estuarine and Coastal Sciences Association) for discussion in an informal environment. We also have a twitter feed @ECSAssociation to follow for information and announcements on upcoming events.

In addition, we are developing an ECSA symposium/workshop for early career researchers in estuarine science, which will include a mix of science (oral and poster presentations), career development (e.g. publishing), keynote speakers and field excursions. The symposium will be an open, pressure-free, relaxed environment for early career researchers to meet, socialise and discuss research and career progression. Details of this will be posted shortly on our website, facebook and twitter pages.

For this to work, we need your help – join the ECSA as a student member and get involved!

Thanks,
Sally
Student Representative - Sally.Little@hull.ac.uk

Arran

Photo: J-P Ducrotoy

From the Membership Treasurer

ECSA has had a surge of new members this year as a result of recruitment at ECSA meetings. This is very encouraging and reflects the success and appeal of the wide range of meetings that come under the ECSA banner across the world. ECSA now has members in 27 countries spread across the globe, from Sweden to Chile and Russia to Australia. As older members retire and some relinquish their membership, we need to keep recruiting new members to enable us to carry on with the work of the Association.

The top two aims in ECSA's constitution are:

i) The promotion of the production and dissemination of scientific knowledge and understanding concerning estuaries and other coastal and brackish waters in order to assist in the prevention of environmental deterioration and the encouragement of resource management for the public benefit.

ii) The holding of meetings, symposia, conferences or other gatherings on subjects relating to estuaries and other brackish and coastal waters.

I hope you'll agree that ECSA achieves these aims, but we are always striving to do more and do better. This is where your membership subscriptions go – in enabling Council members and others to achieve the Association's objectives.

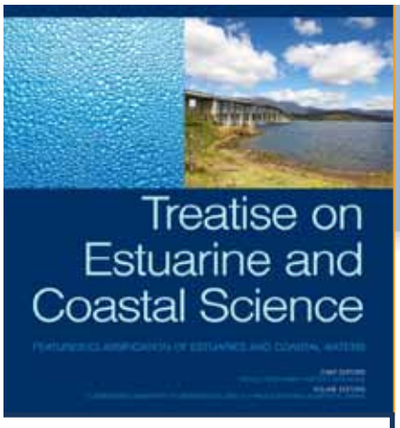
Paypal has been introduced this year to make subscription payment easier for members. Feedback from members on this has been appreciated.

Can I remind you to let me know of any change of mailing address, to ensure that you carry on receiving your copy of the ECSA Bulletin? This also applies to email addresses. If this isn't updated, you will miss out on the e-newsletter. I still don't have email addresses for all members, so if you're not sure, please contact me at clare.scanlan@sepa.org.uk or at the address given on the website and in this Bulletin.

Clare Scanlan
Membership Treasurer

Photo: J-P Ducrotoy

Sydney, Australia



Volume 1
Classification of Estuarine and Nearshore Coastal Ecosystems
Edited by C Simenstad and T Yanagi
Volume 2
Water and Fine Sediment Circulation
Edited by RJ Uncles and SG Monismith
Volume 3
Estuarine and Coastal Geology and Geomorphology
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Volume 4
Geochemistry of Estuaries and Coasts
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Volume 11
Management of Estuaries and Coasts
Edited by H Kremer and J Pinckney
Volume 12
Ecological Economics of Estuaries and Coasts
Edited by M van den Belt and R Costanza

Treatise on Estuarine and Coastal Science
Twelve-Volume Set

Edited by:
***Eric Wolanski*, James Cook University & Australian Institute of Marine Science, Townsville, Queensland, Australia**
***Donald McLusky*, University of Stirling, Scotland, UK**

The study of estuaries and coasts has seen enormous growth in recent years, since changes in these areas have a large effect on the food chain, as well as on the physics and chemistry of the ocean. As the coasts and river banks around the world become more densely populated, the pressure on these ecosystems intensifies, putting a new focus on environmental, socio-economic and policy issues.

Written by a team of international expert scientists, under the guidance of Editors-in-Chief Eric Wolanski and Donald McClusky, the ***Treatise on Estuarine and Coastal Science*** examines topics in depth, and aims to provide a comprehensive scientific resource for all professionals and students in the area of estuarine and coastal science.

The ***Treatise on Estuarine and Coastal Science*** is unprecedented in its coverage and it is an invaluable resource for researchers, students, engineers, and professionals managing rivers, estuaries, and coastal seas. In accord with its intent to provide a comprehensive, state-of-the-art description of estuarine and coastal science, the level of discussion is appropriate for researchers and practitioners at the cutting edge. Nevertheless, topics are discussed in sufficient detail that it will be useful for advanced undergraduate and graduate students and researchers requiring an introductory discussion of a subject.

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ECSA50 – Elsevier, Mestre/ Venice (Italy) 2 – 8 June 2012, Impressions, Images and Information

Victor N. de Jonge
(ECSA Conference Co-ordinator)

The ECSA-50 Symposium, in Venice, celebrated the 50th international meeting of the Estuarine and Coastal Sciences Association (ECSA) and its 40th anniversary, since its foundation in 1971. The Symposium was a joint project between ECSA and Elsevier, the Publishing House, which proved to be an opportunity to boost ECSA's membership and its international exposure. It also enabled the partners to advertise the journal *Estuarine Coastal and Shelf Science* (ECSS) for which one of the main editors is Professor Mike Elliott, from Hull University (UK), who represents a strong historical link between Elsevier's ECSS and ECSA Council. The Symposium was also the occasion for the official launch of the *Treatise on Estuarine and Coastal Science* published by Elsevier, for which the Editors-in-Chief were Eric Wolanski and Donald McLusky. Significantly, the first prestigious ECSA Lifetime Achievement Award was presented to Professor Eric Wolanski (Townsville, Australia) because of his outstanding contribution to coastal sciences. The citation was read out by myself and Geoff Millward (ECSA President) presented the award (see the ECSA Council Citation in this Bulletin and Fig. 1).

The first call for papers saw a total of 853 abstracts submitted and, based on this huge response, a draft programme was developed covering over 500 talks (divided over 6 parallel sessions) and more than 300 posters. The response was more than twice that I had predicted and arrangements had to be made for 3 additional rooms for presentations, in order to satisfy our fundamental principle which was "as many delegates as possible should be able to give an oral presentation". In the end it turned out that we were able to accommodate everybody. The final scientific programme covered most estuarine and coastal topics which offered delegates a wide variety of stimulating research presentations that are recorded elsewhere in this Bulletin.

The total number of delegates who collected their badges was 533, not including the Elsevier staff. This is the largest number of scientists we have ever had at an ECSA Symposium since our foundation. Altogether, these delegates represented 55 countries (Fig. 2) with delegate numbers varying from 1 to 61. The countries with over 10 delegates were Belgium (11), China (13), Netherlands (13), Germany (14), Republic of Korea (15), Mexico (15), Spain (18), United Kingdom (24), United States (24), South Africa (26), Brazil (27), Japan (29), Portugal (37), Australia (43), France (53) and Italy (61). This list may be helpful to help us select countries for our international symposia after 2013. Selection will not only be based on numbers of delegates but certainly also areas and countries with high future potential as illustrated by extent of their coastal areas.

The venue was selected and reserved by Elsevier's Conference Department (NH Hoteles, NH Laguna Palace) and it was a terrific choice with more than enough space to relax inside as well as outside. There was ample space for the registration desk which was situated in a large lobby. The three main lecture theatres easily accommodated the international audience (Fig. 7), although the additional rooms had a lower capacity. One of the additional rooms was too small but delegates understood the unforeseen problems we had to cope with because of the huge response from the international scientific community.

The Symposium dinner took place in Hotel Villa Condulmer (Fig. 8) which was selected by Elsevier. This turned out to be a beautiful place, we ate outside on a warm Venetian evening and we were entertained by live music. This was the perfect location to announce that Professor Eric Wolanski was unanimously selected by the ECSA Council as the recipient for the prestigious ECSA Lifetime Achievement Award 2012 (Fig. 8). We also presented the prizes for the best student poster presentation and the best student oral presentation. The prizes went to Marco Fusi for the best student presentation (Fig. 9) and to Andrew Olds for the best oral presentation. Professor Eric Wolanski presented comparable student prizes on

Photos: Victor N. de Jonge

ECSA50 main theatre

ECSA50 dinner under summer conditions at Villa Condulmer

The winner of the best student poster Marco Fusi receives the certificate and envelope with content from Prof. Mike Elliott and Prof. Victor de Jonge

behalf of Environmental Management of Enclosed Coastal Seas (EMECS). Tomoya Kataoka was awarded the EMECS prize and certificate for the best oral presentation and James Tempest won the EMECS prize for the best student poster.

I take this opportunity to express my gratitude to Dr. Christiane Barranguet (Elsevier's Executive Publisher for ECSS) for all her hard work within Elsevier and with ECSA, in bringing the Symposium to fruition. Christiane: please accept my sincere thanks (on behalf of everybody) for fostering our joint initiative. We need to continue to drink coffee together! Special thanks and appreciation also go to Janet Seabrook, Laura Copeland and Jun You whose professional assistance to all the delegates, in large measure, made the Symposium such a resounding success.

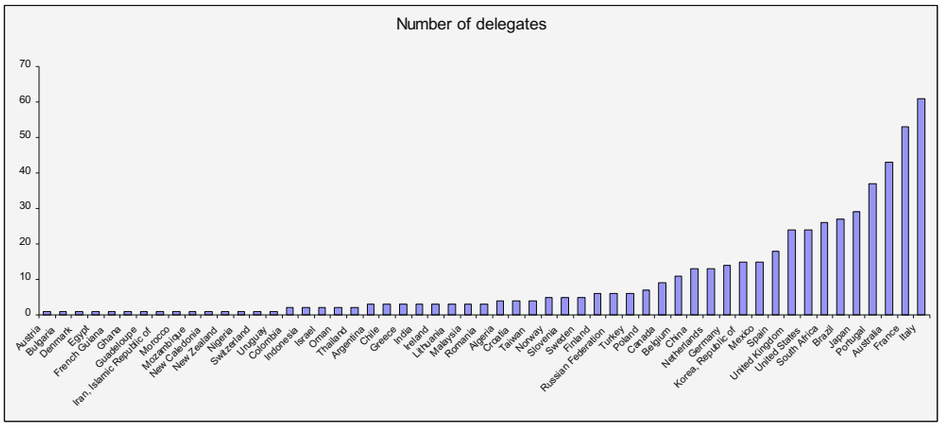
Tomoya Kataoka, Toyohashi University of Technology, Japan, being presented with the EMECS prize for the best oral presentation at ECSA 50 by prof Eric Wolanski of EMECS.

The significant indication of the quality of this Symposium was the large number of delegates. Verbal and e-mail feedback strongly suggests this co-operative venture has been highly successful, so successful, in fact, we have decided to continue with it in the future. Examples of the technical aspects that were most highly appreciated by the participants were:

1. The talks were of a very high standard;
2. Student delegates reported "a great experience";
3. The 10 minutes synchronisation breaks between lectures;
4. Grouping the plenary lectures at the beginning and the end of the Symposium;
5. Presenting the certificates from EMECS and ECSA for the best student presentations (posters and oral talks) at the end of the meeting.

Finally, we want to emphasize that it is our genuine wish that from now on Elsevier and ECSA continue to work in partnership on future projects of mutual interest. ECSA and Elsevier are now already working on the ECSA53 meeting in Shanghai (China). However in between now and ECSA53 there are 2 other international meetings in Lithuania (ECSA 51 23-27 September 2012) and The Netherlands (ECSA 52 21-23 November 2012).

Therefore, on behalf of ECSA Council and Elsevier I thank all delegates for their individual contributions a successful Symposium. Thanks very much for all your support and we hope to meet you at the next ECSA Symposium!



Number of participants per country.

ECSA 50

EMECS Prize for students

Congratulations to students who were presented with the EMECs prizes for the best poster and oral presentation at ECSA

POSTER PRESENTATION

James Tempest

Queen Mary University of London, UK

Sediment characteristics of de-embanked saltmarshes – Implications for hydrologic functioning

ORAL PRESENTATION

Tomoya Kataoka

Toyohashi University of Technology, Japan

Numerical estimation of floating macro-debris inflow flux into Tokyo Bay

A student at ECSA-50

Sofia Koukina

The 50th international symposium of Estuarine & Coastal Sciences Association (ECSA) became an exciting and successful scientific and social event. The symposium bridged across disciplines and particularly linked the natural and social sciences to management. I'm grateful to ECSA for the grant that made my attendance and presentation at ECSA-50 possible (see enclosed certificates of attendance and presentation).

The study entitled "Environmental study of separating basins of Kandalaksha Bay (White Sea, Russian Arctic)" authored by S.E. Koukina, A.A. Vetrov and A.N. Belyaev was presented by Sofia Koukina on 4th of June at session "Anthropogenic change", session chair Dr. Jonathan Atkins, presenting author index 03.7.

In the work presented, the environmental characterization of unique ecosystems being Arctic separating basins using comprehensive biogeochemical approach was made. The most specific features of the basins studied are contrast oxidizing conditions within the water column with anoxia zones occurrence in the bottom depressions that may spread on to the whole water body in winters. The found TOC and n-alkanes distribution showed that sediments from the basins tend to be terrigenous with major input of organic matter from terrestrial plant remains, while the found minor presence of autochthonous microbial sources may indicate the microbial community extension. In the basins studied no significant contamination by trace heavy metals (Pb, Cu, Zn and Cr, in particular) was detected. However, the found amounts of labile and organically bound metal forms exceeded the respective values for the open small bays of the Karelian shore. Hence, in separating basins the relative part of labile bioavailable metals is enhanced in relation to the neighboring open coastal sea and this might be due to the spread of anoxic conditions in sediments and waters. The separating basins studied are essential for the prognosis of anoxia occurrences in Arctic coastal environments.

- **The complex of environmental changes occurring under separation, of which the anoxia and its consequences are of most hazarding, often leads to the disturbance within the ecosystem**

With the help of the symposium, I have linked the Arctic separating basins to other marine, coastal and transitional systems. I've learned more about new techniques of pollutants bioavailability study in different ecosystems. I joined an international interdisciplinary research group – and, in particular, I have registered within LOICZ in order to affiliate the research activities to LOICZ global network.

During the symposium, I've listened to world class speakers and leading researchers on all aspects of estuarine and marine sciences with special attention to Dr. M Meybeck, Dr. E Wolanski, Pr. NN Rabalais, Dr. GE Millward whose fundamental works are always referenced in my studies.

The outstanding poster session caught up on leading-edge techniques and the constraints of the science and management. Thus, the progressive studies of MA Wetzel et al (P94) and AP Mucha et al (P77, P219) support my future studies providing the necessary links between sediment pollution and its effect at different trophic levels.

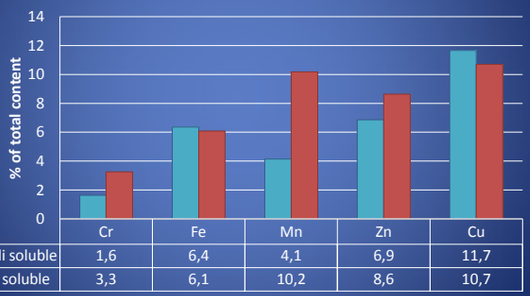
The special benefit from the symposium became for me the meeting with colleagues and friends. Thus, I was glad to meet my international PhD work supervisor Dr. Pr. Herman Hummel and listen to the presentation of Dr. Pr. Antonio Calafat (by presenting author M. Higueras, 06.1).

The symposium also gave me a chance to see the major and exciting new work produced by Elsevier – The Treatise on Estuarine and Coastal Science edited by Eric Wolanski and Donald McLusky.

Potential metal bioavailability in separating basins sediments

Increasing sequence:

Cr<Fe<Mn<Zn<Cu



	Cr	Fe	Mn	Zn	Cu
alkali soluble	1,6	6,4	4,1	6,9	11,7
acid soluble	3,3	6,1	10,2	8,6	10,7

Acknowledgments:

- the study was supported by Russian Foundation of Basic Research (RFBR, Grant 09-05-00011)
- the conference attendance and presentation was supported by Estuarine & Coastal Science Association (ECSA, Small Grant)

Student Report

Nils Krück, School of Biological Sciences , The University of Queensland , Brisbane, Australia

My participation in the 50th international ECSA meeting in Venice was a great success in many respects. First and foremost, I was able to present and receive valuable feedback on my PhD research. My PhD research is focused primarily on the identification of spatial units for management and conservation of non-model fisheries species using a study approach that integrates modern population genetics (also referred to as population genomics), spatially explicit biophysical models, and multivariate statistical analyses. In a novel way, this integrated study approach allows for linking population genetic data to population demography – a link that is notoriously difficult to establish using traditional methods. A common problem when introducing my study approach to fellow students and researchers (non-geneticists in particular) is that it generally appears more complex than it actually is. My presentation and various interesting conversations at the ECSA meeting in Venice increased my confidence to improve and effectively communicate my research. The diagram attached to this report represents a first attempt to capture the basic principles of the presented paper in one illustrative flow chart – I trust it appears more complex than it actually is.

Further to the 50th ECSA meeting, I am glad to say that I've met both students and researchers from around the globe happily joining in discussions about mine as well as their own projects, not only in an official context, but also informally. In my opinion, the latter in particular was what made this conference special, and what may have facilitated new ideas and research directions of many

participants. I hope that some of the contacts I was able to make during this meeting will hold and result in collaborations, perhaps friendship, in the future. My personal highlights at this conference also involved being able to attend the presentations and to talk in person to some of the invited speakers whose papers I have been reading ever since I started focusing on fish population dynamics and fisheries science.

I would like to end this short report by expressing my appreciation of the enormous amount of work associated with organizing an international conference of this magnitude. I am grateful for the opportunity to participate, and I would like to thank the ECSA very much for this!

Email n.krueck@uq.edu.au

Student Report

Noémie Wouters, Oceanographic Centre, Lisbon, Portugal

The 50th ECSA conference, however the first international congress where I was presenting results of my ongoing research! I'm a PhD student of the Oceanographic Centre in Lisbon and my research is funded by a FCT grant (reference: BD/BD/48402/2008) and my supervisors are Prof. Dr. H.N. Cabral and Dr. P.J. Valayer.

The list of participants was impressive, to say the least. Mike & Victor, through their international reputation, no doubt managed to bring together a highly qualified and broad spectrum of scientists from every continent. The organizing team surely also knew how to choose a stylish venue and with the support of the local technical team, the practical aspect of the conference went flawless.

On top of that I, among other young scientists, were given the opportunity to chair a session! Luckily Mike and Victor prepared short notes on the responsibilities of a chairman and personally assured me(us) that it would be ok. When asked, Mike could not even remember his first chairing experience, which meant that no huge incident occurred.

Most speakers introduced themselves spontaneously before the start of the session. Before hand, I made sure to check the pronunciation of the speaker's names and in case of doubt, I simply asked them.

As a chairperson, the most important task was to manage the time correctly.I was anxious that people coming out of a parallel session could still get in and hear the talk they had selected. This meant that in case of short talks with few questions, we sometimes had to wait for just a few minutes!

The subjects of the talks of my session – systems analysis - ranged from the problematic of antifouling to the detection of rare toxic substances in aquatic environments, bivalve shell analyses and toxicology, to finally a comprehensive overview of a regime shift in the Black sea due to eutrophication. What struck me, in this sometimes problematic detection is the potential of the tools presented. When the last speaker of the day still spoke enthusiastically about chemical and microbial contaminationin Canada, I knew that the session was a success.

I attended some presentations of which the subjects were new to me, yet most intriguing. To give one example: in the area of Ecological Economy where values of ecological goods and serviced were expressed in monetary way. Also methods of enquiring how much people are willing to pay for ecological goods were presented. Attendance of such broad based, while detailed conference is worth at least as much as intense university classes. It broadened general scientific knowledge by listening to scientists with a different background presenting their state of the art, with an opportunity to get it from the horses' mouth!

As for my own talk on early warning signal methodologies to the prediction of regime shifts, lags in responses to stressors and cycle analyses despite being early in the day, people showed up! I focused on early warning signals on french national oyster production and also presented a case on the solent oyster showing a drastic decline over time. The questions raised some valuable insights, one scientist raised the issue of 'scale' when assessing the resilience of a system. Indeed I could not have agreed more: on a short time frame one might percieve a system as unstable, but when a larger timeseries are analysed underlying sinewaves could be present as was the case in the french national oysterproduction data.

Finally my ECSA experience most definitely boosted my future research, especially through the numerous discussion with scientists. I found that my methodologies could be applied to a variety of results other speakers presented. I thus surely hope some concrete co-operation will follow, so those results can be presented... at the next ECSA event of course!

See you there!

Citation for the First ECSA Lifetime Achievement Award

ECSA-50 Conference, Venice 2012

Professor Eric Wolanski PhD, DSc (Hon. Causa), FTSE, FIE Aust

Professor Eric Wolanski began his professional career in 1972 as a hydrologist and coastal oceanographer and he is currently Adjunct Professor at James Cook University, Townsville Australia. Over four decades, he has contributed approximately 360 publications to the peer-reviewed, international scientific literature. To do justice to his huge publication record, this citation will refer to key representative publications, for example, he has a total of 19 books of which six have been published since 2000 (Wolanski, 2001a; 2001b; 2006; 2007; Mazda et al., 2007; Perillo et al., 2009). Recently, as a Chief Editor, he saw the completion of Elsevier's major Treatise on Estuarine and Coastal Science (Wolanski and McLusky, 2011), involving 12 volumes containing contributions from scientists across the globe.

His research interests encompass diverse topics from physical oceanography to the modelling and visualisation of oceanographic and fisheries data for science and management. He has conducted fieldwork and modelling in estuaries, mangroves, saltmarshes and coral reefs, with a special focus on the Great Barrier Reef. Professor Wolanski has been the leader of major projects in coastal oceanography, sediment transport, water quality and hydrology. He has also made significant contributions in sustainable coastal development and environmental impacts arising from oil exploration, production, transportation and spills. His interests extend to investigating the fate of mine tailings, erosion and siltation involving dredge spoil, foreshore and hydropower development, agriculture and aquaculture, and the influence of global change on estuarine and coastal waters.

Professor Wolanski has made a remarkable contribution to monitoring and modelling of marine hydrodynamics (Andutta et al., 2011; Lambrechts et al., 2008), fine sediment transport (Wolanski et al., 2008; Lambrechts et al., 2010) and the fate of turtle hatchings (Harmann et al., 2011) in estuaries and coastal waters. His pioneering research has resulted in novel tools involving 3-dimensional modelling and visualisation and, in 2000, he was a Guest Editor for a special volume of *Estuarine Coastal and Shelf Science* on the topic of "Visualization in Marine Science". His contributions included the visualization of water transport (Wolanski and Spagnol, 2000), the dispersion of contaminated waters (Wolanski et al., 2000) and larvae recruitment in tropical coastal waters (Andutta et al., 2012). The visualisation approach is proving to be a crucial decision-support tool in assisting coastal managers of mangroves, and coral reefs to better evaluate complex biological and physical data sets, thereby allowing assessment of the impacts of various management decisions on water transport and its quality (Wolanski, 2002).

Recently, Professor Wolanski has diversified his research to the study of the effects of climate change on coastal wetlands (Gedan et al., 2011) and the impacts of global change on the Great Barrier Reef (Bohensky et al., 2011). He has also contributed to the upsurge of research in ecosystem services as related to coastal protection (Koch et al., 2009) and ecosystem-based management (Granek et al., 2010).

The Council of the Estuarine and Coastal Sciences Association judged that Professor Wolanski has shown outstanding merit in his research output and his long-term commitment to the international profiling of the Elsevier journal *Estuarine Coastal and Shelf Science* for which he is now senior Editor-in-Chief. Because of his outstanding contribution to our subject, our Association and to our established link with Elsevier journals, the Council of ECSA unanimously agreed to give the first Lifetime Achievement Award to Professor Eric Wolanski. The Council of the Estuarine and Coastal Sciences Association warmly congratulate Professor Wolanski on his Lifetime Achievement.

Citation submitted by The Council of the Estuarine and Coastal Sciences Association.

Prof Eric Wolanski being presented the First ECSA Lifetime Achievement Award by ECSA President Geoff Millward

Prof Eric Wolanski at the Conference dinner in Mestre (Italy)

Selected Publications since 2000

Books Published

Mazda, Y., Wolanski, E., Ridd, P.V., 2007. The role of physical processes in mangrove environments: A manual for the preservation and conservation of mangrove systems. Terrapub, Tokyo, 593 pp.

Perillo, G.M.E., Wolanski, E., Cahoon, D., Brinson, M., 2009. Coastal Wetlands. An integrated ecosystem approach. Elsevier, Amsterdam, 941 pp.

Wolanski, E., 2001a. Mangroven – Lebensraume zwischen Land und Meer. Filander Press, Furth, Germany, 205 pp.

Wolanski, E., 2001b. Oceanographic processes of coral reefs: Physical and Biological Links in the Great Barrier Reef. CRC Press, Boca Raton, Florida, 356 pp.

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Invited Speaker Abstracts

Terrestrial and marine forcings on coastal ecosystems

Ivan Valiela
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Coastal ecosystems are subject to terrestrial effects driven by watershed land use, geology, and topography, and marine effects related to frequency of upwelling, bottom relief, and tidal forcings. Varied site-specific mechanisms underlie land-sea couplings, and control the degree to which estuarine systems—including marshes, mangrove forests, and near-shore waters—respond and modify the couplings. Anthropogenic influences on global-scale mechanisms, and on local spatial scales are increasing world-wide, and are modifying long-term links between coastal watersheds, estuarine wetlands, and near-shore environments. The contrasting complex and diverse terrestrial- and marine-derived effects of such global and local changes are manifest by comparisons of two well-documented case histories of coupled watershed-estuary systems in temperate New England and the tropical Pacific coast of Panama. In New England, where humans are more common, watershed land uses, particularly urbanization, dominate couplings and their dynamics, and force changes on estuaries. In coastal Pacific Panama, watershed deforestation and coastal upwelling take turns influencing estuaries; mangroves act as transformers that decouple land from sea as well as themselves export materials to the adjoining sea. In New England and Pacific Panama, within-estuary biogeochemical transformations therefore play essential roles, and in turn are influenced by global-scale changes such as increased temperature and precipitation and sea level rise.

Connecting continents and people to oceans: global rivers, from the Holocene to the Anthropocene

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In Earth System analysis, rivers are essential links between continents and oceans, delivering water, sediments and dissolved materials to the coastal zone. Rivers have also been used as a principal water resource and a waste conveyor by humans. Their global evolution from the Holocene to the Anthropocene reflects this duality.

In the Holocene, river basins were greatly exposed to climate variations, sea level rise and glaciations, features that have affected their river networks, their water balance (arheism, endorheism, exorheism) and their related fluxes. At the global scale, rivers can be aggregated and described as a giant 150 piece puzzle (Coastal Catchments) within which present fluxes of riverine materials can be determined. They show natural variations, covering 2 to 3 orders of magnitude, for concentrations and yields, i.e. there is no "average" river. Hot spots of global river fluxes to the coast are different for each type of riverborne material (e.g. sediment, silica, carbon).This heterogeneity is even larger for river inputs, per unit marine area or volume, to regional seas and open oceans. In the present Anthropocene era, rivers have already been markedly modified by Humans, resulting generally in increased concentrations of nutrients, ions and metals. River fluxes to the coast have therefore increased in many basins, sometimes by more than an order of magnitude; in others the growing occurrence of water abstraction, for irrigation, and of dams and reservoirs, lead to a marked decrease of water, sediment and nutrient fluxes. Other anthropogenic control factors of river evolution, revealed by long-term studies and/or sedimentary archives, include economic development, material flows within the anthroposphere, evolutions of analytical capacities and scientific knowledge, societal awareness and reactivity (e.g. heavy metals).Therefore there are many trajectories of river evolution. Some success stories can be found in rivers under large-scale human pressure, as in Western Europe. The complex human dimension, lack of field chemistry data and future runoff prediction are the major limiting factors influencing the global picture of river futures. Local to regional models combining Earth System science, the human dimension and global change scenarios should be first validated. Their extrapolation at the global scale depends on our capacity to bridge the very large data gap between the well-surveyed regions (North America and W. Europe), in which long- term records are also available, and the least surveyed ones, particularly in Africa. In addition to the expected climate change impacts on rivers, hydro-structures (dams, irrigation schemes, channel regulations), deforestation and other land-use changes, contamination heritage (polluted soils, mining sites, waste dumps and slow-renewing aquifers) will result in the permanent alteration of rivers at the global scale.

Monitoring needs for managing complex lagoons: the case of Venice

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"You can't manage what you don't measure", an old management adage says, and actually huge efforts have been spent by the industrial sector to associate figures not only to the steps of production chain, but even to immaterial values, like education, culture, people's skills. A similar phenomenon also occurred in the environmental sector where the availability of new instruments (both totally new ones such as satellite-borne equipment and the new generations of electronic instruments) opened a completely new perspective for describing the natural world. Today, from micro to macro, we can measure chemical elements sub-traces up to one part in a trillion, as well as we can describe a hurricane's path across the globe. This large measurement capability, however, must be "right-sized" when considering the long-term monitoring needs of complex environments: the risk is to spend more efforts in acquiring huge amounts of data than in understanding the key elements for supporting the environmental management choices. In addition, the problem of data management and of process knowledge is often under-valued, also from the economic point of view, leading to the huge amount of data unavailable and unexploited. The simple truth that the information total cost is sometimes more than the data acquisition cost seems to be unknown in many Public Administrations' budgets. Finally, in complex systems with several public and private stakeholders, often many monitoring programmes overlap and many data duplication occur, but rarely is the data quality assessed and compared. Furthermore, data-sharing systems do not exist, nor are information holes are identified.

Lagoons are very complex systems, being transitional ecosystems and

with large anthropogenic pressures and diverse uses. The measurement needs are therefore very large, involving all the environmental matrices, as well as some key human-related activities, such as transport and fisheries. An independent survey in 2007 [1] made an extensive list of existing monitoring programmes in the Venice Lagoon, run by Public Administrations involved in safeguarding Venice: it indicated a very relevant amount of money, identified some overlaps and expressed a huge coordination need. Five years later, few positive harmonization examples can be reported, while some programmes were terminated just for budget restrictions and as some relevant data are not now acquired by anybody. The present framework of scarce public economic resources and new management needs (above all the MOSE operation and the other climate adaptation measures), requires a very careful examination about the critical long-term monitoring needs of the Venice Lagoon, to face the management challenge. If one of the "seven deadly diseases of management is running a company on visible figures alone" [2], the same can be told for some precious ecosystems, but what are the essential measurements we need, also possibly to improve our processes' knowledge? Here I compare and discuss the Venice 2012 situation compared to the 2007 snapshot and comment on existing coordination examples as well as proposing general criteria for assessing the lagoons' monitoring needs.

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Decline and recovery of coastal biodiversity and ecosystem services

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Coastal ecosystems are among the most biodiverse and productive on the planet, and play an important role for human development, as they support diverse activities including shipping, fishing, aquaculture, settlement, and recreation. Here I illustrate how those usages are linked to a suite of ecosystem functions and services, and in which ways those are dependent on coastal biodiversity. I then trace the history of costal biodiversity loss in the wake of increasing human population density and industrialization of coastlines around the world. I identify resource exploitation and habitat destruction as key drivers, and discuss the effectiveness of different strategies to mitigate these impacts, and to halt and reverse current trends of biodiversity loss. A number of case studies illustrate well the trajectory of biodiversity decline and recovery, given targeted management actions. Importantly, the decline and recovery of ecosystem services can be shown to correlate tightly with the trajectory of biodiversity. Trade-offs between coastal development and biodiversity loss are examined. I present some theory and empirical data that illustrate these trade-offs and ways to optimize them giving conflicting societal objectives, using fishing, shrimp farming, and costal protection as case studies. In conclusion, I take a broad, global perspective on the current states and possible futures of coastal ecosystems, highlighting hotspots of biodiversity and conservation need, that occur often in areas of limited data availability. I argue that geographic research priorities need to be gradually re-aligned with pressing conservation concerns in the developing world.

Biodiversity in lagoon ecosystems: Observations on a biogeographical scale

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Conflicting paradigms have been proposed to describe and explain biodiversity in estuaries and lagoons. They have been described both as species poor and species rich ecosystems, attributing most of the difference to the scale of observation.

Here, we have approached a description of biodiversity in lagoon ecosystem on a biogeographical scale focusing on three geographical areas, i.e, along the Mediterranean, Portuguese Atlantic and Australian coasts. At one of the areas, the Mediterranean, the description was downscaled at the landscape level focusing on the different benthic habitat types. We searched for common patterns in biodiversity within and among scales and for bottom up (species trait based) vs. top-down (ecosystem property based) explanations.

Rarity, redundancy and singularity are key properties of benthic macroinvertebrate guilds at every geographical area, affecting b and g diversity. At every area an high regional biodiversity is determined by a large number of rare species and a high dissimilarity among lagoons; however, dissimilarity was higher in both Mediterranean and Australian than in Portuguese lagoons. Life cycle traits and the behaviour of larval stages, at the species level, as well as lagoon openness and vigour, at the ecosystem level, seem to have a major role to explain the difference in patterns of biodiversity between study areas at a biogeographical scale. The same species and ecosystem level properties, together with spatial patchiness, seem also to be key factors downscaling biodiversity analysis at the landscape level.

The analysis performed support the scaling of biodiversity in lagoon ecosystems, which results from cumulative integrations of rare species with narrow ranges across spatial and temporal scales. The analysis also suggests that ecosystem properties, as openness and vigour, determining connectivity and overall niche space, have a major role to explain biodiversity at the different scale considered.

Sediment delivery and ecosytem health of mega-estuaries: Comparing the Yangtze and the Nile

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Comparing the evolution of the Yangtze and the Nile estuaries, and the human impact, may seem counterintuitive because of so different physical settings. Nevertheless it is interesting to see the estuarine eco-consequences in response to the extremes of human forcing. The monsoon (for the Yangtze) and the arid climate (for the Nile) settings have made the hydrology and sediment delivery of the river-estuary system quite different. However, both these estuaries have experienced a dramatic reduction of riverine sediment input and ecological degradation due to dam construction in the past half century. At present nearly zero riverine suspended sediment inflow into the Nile estuary contrasts with its high turbidity setting (SSC ~ 0.3 kg m-3 on average) before damming when the river delivered ~150 Mt a-1 of sediment to coast. The Yangtze riverine sediment inflow into the estuary has also been measurably reduced from 470 to170 Mt a-1 and SSC decreasing from 0.6 to 0.3 kg m-3 on average, although the monsoon-driven resuspension sustains a

higher SSC in winter season. A most noticeable phenomenon is the SSC-related DSi reduction by dams in both estuaries (~1/3 off for the both cases), while riverine N and P inputs to the estuaries are increasingly yearly mainly due to fertilizer application in the watersheds. At present, the Yangtze estuary receives ~7 times more N-fertilizer (~7000 x106 kg a-1) than the Nile (~1000 x106 kg a-1), while riverine P-fertilizer loading is almost the same in both systems. This results in an altered stochiometric ratio of nutrients for generating blooms of not-silicated algae species that are increasingly replacing silicated ones over the last 20 years. While Harmful Algae Blooms are reported in both the Nile and the Yangtze estuaries, surprisingly little attention has been given to the resulting acidification of these two estuaries. Long term monitoring data show that the pH has decreased obviously in both the estuaries, especially markedly in the Yangtze in the past decades from 8.2 to 7.8 on average. Decreasing pH demonstrates estuarine acidification, the effects of which on the ecosystem health remain little understood.

Oxygen decline: Causes and consequences in coastal and shelf waters

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Oxygen deficient water, sometimes referred to as hypoxia, originates from natural processes alone or a combination of natural and anthropogenic processes. The natural processes are carbon production via photosynthesis and carbon degradation through microbial respiration and when combined with isolation of the bottom water from surface waters often lead to hypoxia. Hypoxia is more likely to occur where the water residence time is longer, water exchange and ventilation are minimal, stratification occurs, and carbon production and export to the bottom are high. Hypoxia has existed through geologic time and naturally occurs in oxygen minimum zones, deep basins, eastern boundary upwelling systems, and fjords. Hypoxia development in many areas of the world's coastal ocean is accelerated by human activities, primarily increased nutrient loads that have set in motion a cascading chain of events related to eutrophication. The rate of oxygen decline in waters with adequate time series is more severe near the coast than in the open ocean. Also the frequency of occurrence of negative oxygen trends in time series data is greater in coastal than open marine waters. Oceanic oxygen declines are related to increasing temperatures (an ultimate human cause), which may also be affecting coastal waters. The coastal trends, however, are related to more direct human influences on watersheds and receiving waters. With an ever increasing population, the inputs of nutrients to coastal systems will continue to escalate, especially in developing countries, as the application of nutrients for growth of crops to sustain human needs and the burning of fossil fuels in response to industrialization, will continue. In developed countries the additional expansion of croplands and fertilizer use is currently high in response to generating biomass for ethanol production. Oxygen deficiency, especially in coastal and shelf waters, will be more widespread and frequent than is presently the situation.

Physics-biology feedbacks in estuarine fine sediment dynamics

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An increase in human activities in river catchments is resulting in increased muddiness of estuaries in many regions of the world. This increased muddiness has management implications, such as increased turbidity and decreased quality of life for the human population, storing pollutants (e.g. heavy metals) for decades to centuries and then reliberating them if the mud is eroded or dredged, changing some coasts from sandy to muddy, which is a significant and usually permanent environmental change modifying the net nutrient budgets of estuaries transferring seaward the occurrence of Harmful Algae Blooms if the light regime becomes the limiting factor in the estuary.

In recent decades, much of the knowledge of fine sediment (mud) dynamics, and its modelling, came from the engineering community. Modelling mud dynamics by engineers seemed so 'simple', the belief was that mud was just a messy fluid and that its behaviour could be modelled by adding a few equations for erosion and deposition to models calibrated in laboratory experiments with the belief that the models could then easily be 'fine-tuned' against some field data for the collection of which ingenious probes were designed.

Experience has shown that these engineering models are unable to reproduce much of the field observations for muddy estuaries. A reason for this failure is that these models largely neglect the biology and chemistry, which has a major influence in controlling:

- the settling of mud flocs
- the resuspension of settled mud
- the dewatering (consolidation)
- the patchiness
- the nutrient dynamics
- the fluidization of mud by waves
- the dynamics of tidal creeks

Pollutants in turn can modify these biological feedback processes and lead to another trajectory for the ecosystem health of estuaries.

We quantify, using the LOICZ estuarine nutrient budget model modified for mud, the role of mud in the nutrient dynamics.

Mud and muddy waters must be studied as a living body, not just a messy fluid as originally seen by engineers. This highlights research priorities to advance the knowledge of mud dynamics by quantifying the physics-biology links.

Features of and threats to the biodiversity of sandy beaches

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I provide a synopsis of the physical and ecological attributes of sandy beach ecosystems and review the main anthropogenic pressures acting on the world's single largest type of open shoreline. Exposed ocean beaches are controlled by waves, tides, and sediment type. Physical and biological factors operating over several spatial scales govern macrofauna biodiversity patterns on sandy beaches. Global patterns can be reliably predicted on the basis of physical features of the beach environment. Biological interactions may become more important regulatory agents in benign dissipative beaches, which harbor high species richness and abundance of organisms. At the mesoscale, longshore and across-shore distributions tend to be unimodal, bell-shaped within a beach, with abundance varying from the central region to range boundaries. Zonation is highly dynamic and not sharply defined, because of short (hourly, daily) or medium (seasonal) term reactions to environmental conditions. At the microscale (individual neighbourhood), behavioural factors and intra/interspecific interactions become more important as density increases. Sandy beaches and their biodiversity are threatened by a range of stressors that span a spectrum of impact scales. Press disturbances are becoming increasingly common. Sea-level rise and other effects of global warming are intensifying other anthropogenic pressures, and

causing unprecedented ecological impacts. I provide compelling long-term evidences of the concurrent effect of fishing, market price and climate variability on exploited beach clams at a continental scale. New perspectives for rational management of sandy beaches require also incentives for effective governance and sharing of management roles between government and local stakeholders.

Fishes and fisheries in tropical estuaries: The last 10 years

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There has been an increase in knowledge of many aspects of the biology and ecology of tropical estuarine fishes since 2002, as well as significant changes to many estuarine fisheries. Analyses of literature databases (2002- 2012) show that: of the c. 500 relevant papers, 52% are primarily related to ecology, 11% to conservation, 11% to anthropogenic and pollution effects on fishes, 9% to fisheries, 7% to aquaculture, 4% to study techniques, and 1% each to fish larvae, effects of fishing, taxonomy, climate change, evolution and genetics. In terms of geographic spread 17% are from North America, 15% from south Asia, 14% from the Caribbean, 13% from Australasia, 12% from Africa and 9% each from South America and SE Asia. Research papers came from 50 countries of which the dominant were USA (15%), India (12%), Australia (11%) and Brazil (7%). Increasing numbers of studies in West Africa, SE and South Asia and South America have increased basic knowledge of the ecology of estuarine fish faunas. Increases in understanding relate to: roles of salinity, turbidity and habitat diversity; connectivity between habitats; water flow; ecological drivers of spatial variability; scale dependent variation; thermal tolerances; movement patterns; food webs; larval adaptations; and the viability of areas heavily impacted by human activities. New reviews both challenge and support different aspects of the estuarine dependence paradigm – still perhaps one of the main research issues – and the protective function of estuaries and mangroves for juvenile fishes has received attention in relation to e.g. predation risks and fisheries. There have also been significant advances in the use of guilds and biodiversity models. Fishing pressures have continued unabated in most tropical estuaries and are summarised and management issues discussed. Understanding of the relationships between fisheries production and mangroves has advanced and significant differences have emerged between Indo-West Pacific and Atlantic systems. The effects of fishing itself have also received attention and research is often related to conservation studies. The effects of anthropogenic activities are reviewed and important advances in mitigation are discussed. Restoration of estuarine habitats, such as mangroves, previously taking place mainly in countries such as Australia and USA, is now occurring in more countries. The design of reserves and the use of protected areas as management tools are gaining credence. Finally, the evidence for actual and potential effects of climate change is discussed.

Is the science for integrated estuarine and marine managemeng fit-for-pirpose?-paradigms of what we do know and problems because of what we don't know!

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Wetlands and estuarine/lagoonal, coastal and marine areas have long been degraded by many uses and users, especially causing habitat loss which may be temporary (e.g. water quality problems) or permanent (e.g. land claim). There are impacts on the areas from outside influences (exogenic unmanaged pressures) and internal influences (endogenic managed pressures). Similarly, the understanding and management of problems and solutions relies on a typology of hazards and risks and hence management responses are required to increase the ability of an area to accommodate such natural or anthropogenic hazards such as sea-level rise and storm-surges while at the same time deliver benefits for society. Unless these pressures are managed then ecosystem structure and functioning are impaired and ecological and socio-economic carrying capacity will be reduced. The societal benefits stem from the ability of these habitats to fulfil an economic role such as the production of food, sequestration of carbon, nutrient cycling, providing recreation, absorbing flooding, etc. Hence their degradation ultimately affects human and ecological health and societal wealth generation. Thus habitat recreation, restoration and management have to balance the maintenance of ecosystem services and the protection of biodiversity while at the same time delivering socio-economic benefits such as supporting ports. This paper describes the science and management, our present and required understanding, and management initiatives and governance required to achieve these aims using examples from various parts of the world. These examples include habitat restoration relating to port development, infrastructure creation, and sediment and water degradation from pollution. We thus need the ability to fulfil 'The Ecosystem Approach' sensu stricto but within a nested-DPSIR/DPSEEAC approach which links activities, pressures, impacts and responses not only within estuaries/lagoons/coastal areas but also outside them and with both existing and required information/data/evidence. It presents a science and management framework which illustrates the habitat needs for the main organisms and communities, the conservation goals and management indicators and objectives, the problems of sectoral science and management and the need for holistic approaches. It also indicates that any successful and sustainable management of these areas has to fulfil the 10 tenets: that actions have to be environmentally/ecologically sustainable, economically viable, technologically feasible, socially desirable/tolerable, ethically defensible (morally correct), culturally inclusive, legally permissible, administratively achievable, effectively communicable and politically expedient.

Valuing ecosystem services and assets: the key to unlocking the power of market forces to conserve coasts and estuaries

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The field of environmental valuation is more than 50 years old. With each decade has come more sophisticated methodologies that add precision and more credibility to these efforts. As with almost any good, when it is in short supply its value increases. Some important natural resources have become scarce in recent decades and hence their value, whether or not traded in the market place has become higher. Once thought to be abundant without any need for conservation or preservation, the disappearance of many natural assets, particularly those along the shore, such as beaches and estuaries, have now become valuable assets with services that have been demonstrated to power local and regional economies. Estuaries were filled over many decades, for residential and commercial developments, and beaches were allowed to erode from overdevelopment too close to shorelines, and diversion of watersheds. Now that their links to the market economy have become clearer, large sums are being spent restoring estuaries, stabilizing beaches, and focusing attention on preserving those that are healthy. The growing importance of coastal and estuarine losses stands out as growing global populations put pressure on them, extreme events destroy or disturb them, pollution

runoff threatens their functions and uses. And, the final blow will be an exacerbation of all of these in years to come from impacts of climate change. Ecosystems and their services need values attributed to them so they become integral to cost/benefit analyses and development decisions. Otherwise market failures from ignoring these values will lead to inefficient and unintended outcomes that will harm societies.

This Paper discusses:

1. The difficulties connecting the values of products and services traded in the market place with natural capital and services that don't have market prices and often remain hidden.
2. Reasons why valuing ecosystems and services are essential for society.
3. Current trends and efforts that include and connect natural values with market values in decision making, e.g. marine spatial planning and ocean zoning, payment for environmental services (PES), institutional acceptance of green accounting and natural accounts.
4. Brief case summaries of 1) successful applications of ecosystem values (premium real estate values along the coast and estuaries; beach values contributing to tourist revenues; estuarine restoration encouraging developments with revenues many times the cost of restoration; and 2) lessons learned when undervalued ecosystems are lost, such as mangroves and wetlands.

[K13] Integrating ecological, economic and social aspects to generate useful management information under the EU directives' 'ecosystem approach'

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If we as scientists cannot decide upon what research, monitoring and technical tools should be used as a basis for policy making and management, then the politicians and other decision makers will continue to follow the line of 'weak' sustainability (applying monetary substitution rules to natural capital) instead of 'strong' sustainability (applying alternative rules like the precautionary principle). Suitable integral indicators or indices covering ecological as well as socio-economic aspects are thus required. There is, however, a clear friction between what can be delivered in terms of useful '(integral) indicators' and what decision makers require us to deliver in terms of 'simple, cheap, easy to understand' while the real situation is extremely complex. This social, economic and ecological complexity has been an important impediment to the required technical co-operation between the decision makers and the natural and social scientists since the publication of the Brundtland report. Given the panarchic character of natural systems realistic base environmental indicators should be anchored to a thorough examination of the functioning and the structure of ecosystems and related integrated indicators instead of the use of dynamical models deficient in reducing the uncertainty as to future system behaviour, or selecting for 'cute and cuddling' icons of any ecosystem without knowing what they ecologically represent. The connection of the social and the ecological aspects in an integrated approach is thus pivotal to make sustainability as starting point a 'reality'. To arrive at the required integration we propose that decision makers should stop asking for 'simple' environmental indicators and accept the complex reality that is our environment. To achieve this we propose that they should buttress to make the Odum food web ideas functional by the application of ecological network analysis (ENA) and following the DPSIR approach at a scale where socio-economic and ecological information can be integrated, which is the 'habitat' level.

Photo: J-P Ducrotoy

Saint-Quentin-en-Tourmont

The Gironde Estuary in brief

Mario Lepage
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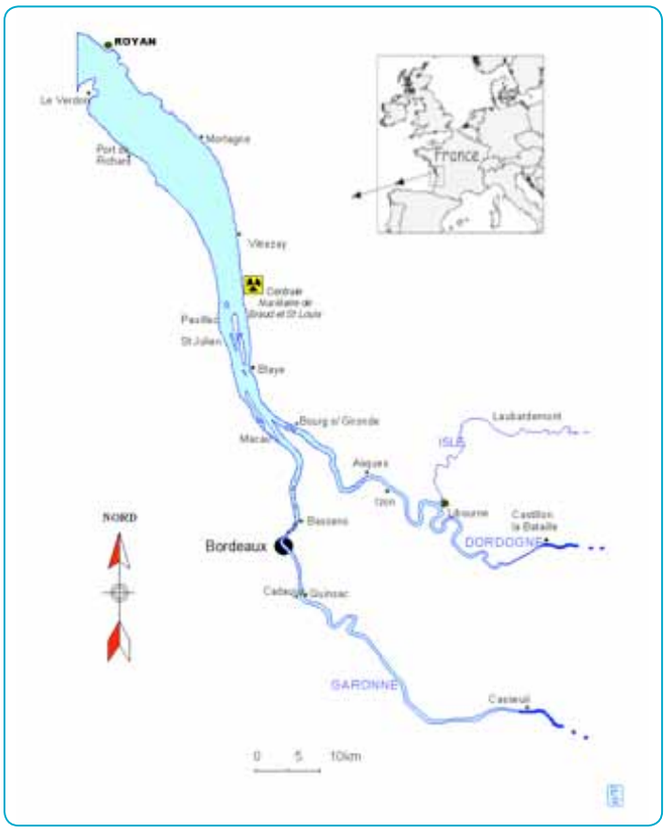


The Gironde estuary is located in the southwest of France (Fig. 1). This estuary is the widest in Europe with 635 km^2 of surface at high tide in the marine estuary. It drains 81,000 km^2 and the mean flow use to be 1,000 m^{3}s^{-1} (Allen, 1972) 40 years ago. Today, the mean annual flow is reduced by 290 m^{3}s^{-1} , leading to a progressive marinisation of the estuary. The largest part of the estuary is 11 km wide. Mean depth is about 8m at mid-tide but at the entrance, the depth can reach 30m. There are two navigation channels, a natural one on the right side, with depths ranging from 4 to 20 meters and an artificial one on the left side, with a depth ranging from 7 to 30 meters. Several islands lay between these channels, in the upper part and on sandy-muddy banks in the lower part.

The bottom of the estuary is mainly a mixture of sand and mud with the sandiest part in the lower estuary and the muddiest part in the upper estuary except for an area nearby Blaye where a large sand bank still occur. There are two ebb and two flood tides each day, lasting about 6.2 hours. The tidal range is approximately 5 meters at the entrance and can reach 6.4 m in Bordeaux. The salinity follows a gradient according to the strength of the tide and the river flow, it varies from 0 to 30 from where the Garonne and Dordogne rivers meet to the mouth of the estuary. During the low water period, the salinity can reach Bordeaux and even upper.

In the muddiest part of the estuary, the turbidity can be as high as 1 gl^{-1} near the surface and up to 50 gl^{-1} over the bottom in the maximum turbidity area (Latouche et and Jouanneau, 1994). This area, changing with the tide, can spread on 20 to 60 km, depending on the river outflow and the neap or spring tide (Sottolichio, 1999). The water temperature in the estuary ranges between 6 °C in January to 26 °C in July (Maurice, 1994).

NAVIGATIONAL FEATURES AND UNDERWATER MINING ACTIVITIES

Since the end of the 19th century, several navigational features (embankments, rockfill, groynes) have been built in the Gironde in order to facilitate the navigation between the entrance and Bordeaux. Although it supports little industry, (mainly harbour and a nuclear power plant), the estuary has been constantly disturbed by the dredging of the navigation channel since it was first created in 1875. Today, regular dredging is still carried out for its maintenance and represents 8 millions tons of dredged material per year. In addition to intensive agricultural practices that influence the availability of sediment, all these operations, from the past and present, have contributed the enrichment of the maximum turbidity zone, which moves with the tide between the river and the estuary. The dumping of dredged material, as well as the "natural" maximum turbidity itself, can cause, especially during the summer, a sharp decline in dissolved oxygen or even localised total anoxia due to organic matter degradation and poor photosynthesis (Romaña and Thouvenin, 1990), especially in the upper part of the estuary nearby Bordeaux.

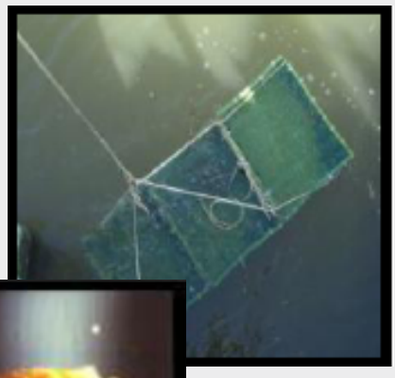
Research activities

Due to the presence of a nuclear power plant, the Gironde estuary is one of the most studied estuaries in France and long time series are available on biological compartments. Several research units (Bordeaux University, IRSTEA, IFREMER, BRGM) are involved in regional, national and European research project dealing with the Gironde estuary. It has lead to interdisciplinary project between, marine biologist, economist and sociologist about saltmarshes governance and restoration projects. Studies about heavy metals contamination in sediment and living resources as well as emerging pollutant (medicinal molecules) are developed in all media (water, sediment and biota).

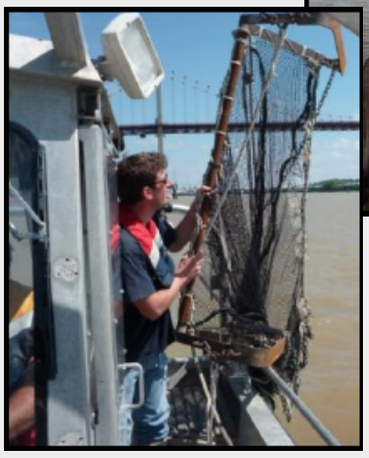
A new project in partnership between nearly 30 scientists, industrial (Lyonnaise des eaux) and public parties (Bordeaux urban community, Adour Garonne Water Agency) was developed as to understand the effect of urban sewage around Bordeaux and upstream input during the low water period and to propose solution to avoid in the future the hypoxia phenomenon that are observed in recent years. This project is called "Integrated study of the effect of upstream and local contributions to the functioning of the Garonne River" Acronym in French is Projet ETIAGE. More information can be found on the website.
http://www.etiage.fr

POCIS use to sample medicinal molecules

Caging of bivalve (Corbicula fluminea)



Fish sampling with beam trawl and fyke net



Sampling device within the sewage treatment plant

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Institute of Estuarine and Coastal Studies

The Institute of Estuarine and Coastal Studies (IECS), based at the University of Hull, has been undertaking multidisciplinary, pure and applied research and consultancy in the marine ecosystem on a worldwide basis since 1982.

Our activities range from the biological and physical environments (bathymetry, hydrodynamics, benthic & pelagic fauna, and ornithology) to coastal planning, environmental quality, marine governance, socio-economics and Environmental Impact Assessment (EIA).

We have a staff of over 20 full-time qualified marine scientists, and can draw on further expertise from Associates in a range of fields including environmental law, policy & economics and geomorphology. In addition, IECS has many postgraduate research students, intern students and also hosts visiting scientific researchers.

We link to the University of Hull's Departments of Biological Sciences, Geography and Politics as well as the Law School, the environmental economists in the Business School and our sister institute, the University's International Fisheries Institute (HIFI) with its complementary freshwater expertise (see www.hull.ac.uk/hifi).

Our many projects are funded by research councils, the European Union, statutory bodies, government departments, industries, NGOs and environmental consultancies. IECS is a successful member of the National Marine Biological Analytical Quality Control (NMBAQC) scheme with staff also holding membership of professional bodies such as the Society of Biology and the Institute of Ecology and Environmental Management.

EXPERTISE

Environmental Impact Assessment

Full EIA have been undertaken for many coastal activities including flood defence works, oil and gas exploration, marine aggregate extraction, power generation and port developments. Expert input into the aquatic ecological impact components of the EIA is provided, e.g. for individual Environmental Statement (ES) chapters.

Intertidal and Subtidal Ecology

Our large amount of subtidal and intertidal benthic/seabed research using field surveys, taxonomic identification and multivariate analysis includes various grab sampling techniques, underwater video, acoustic mapping, sedimentology and plankton surveys.

Fieldwork in the Thames

Fieldwork - infauna coring Lincolnshire beaches

Fish and Fisheries Studies

Our estuarine and marine fish research examines migratory, nursery and feeding ecology as well as the scientific and socio-economic impacts on fish and fisheries, including stock assessment, fish impingement studies and fish trawl surveys.

Ornithology and Marine Mammal Study

The relationships between birds and marine mammals, human activities and the marine environment are studied by our ornithologists and Marine Mammal Observers. Estuarine and coastal bird populations are studied from land-based locations, whilst marine surveys for birds and mammals occur from boat and aircraft based survey platforms. Several staff are ESAS trained & accredited.

Marine Planning, Governance and Socio-economics

We study integrated coastal zone management, the implementation and implications of national/European governance, ecosystem services and societal benefits, and natural resource economics.

Fieldwork - Setting fyke nets

Research & Publications

Our research is submitted by the university for the UK Research Excellence Framework. In 2008 it helped secure an internationally excellent profile for the university in UoA32 (Geography and Environmental Studies). In addition to many project reports, the Institute has produced many books, book chapters and scientific papers in international peer-reviewed journals.

SERVICES TO INDUSTRY AND STATUTORY BODIES

IECS works with many industrial sectors, providing expert advice and research into potential impacts to the marine system, methods to minimise impacts and assistance with the consenting process for new developments. Impact assessment work includes both the physical (hydrodynamics, sediment transport and water quality), and biological (benthic invertebrates, fish and birds) systems.

Recent commissions have included work on solute mining gas storage projects, port developments, power plants, offshore wind farms and other renewable energy projects. In addition, we have provided advice to statutory and governmental bodies throughout Europe, e.g. on the implementation of EU Directives and the UK Marine and Coastal Access Act.

Work for statutory conservation bodies includes mapping of subtidal and intertidal biotope communities, characterisation (and modelling) of seabed habitats, establishing management strategies for priority and/or important conservation species, and deriving robust survey strategies for habitat monitoring.

In essence we offer expertise in:

- **Intertidal and subtidal benthic surveys**
- **Fish and fisheries studies**
- **Marine and estuarine ornithology**
- **Coastal topography and sediment studies**
- **Effluent toxicity bioassay, discharge monitoring and modelling**
- **Environmental Impact Assessment**
- **Coastal planning, environmental economics and marine legislation**
- **Pan-European environmental research**

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UoH - Central Campus

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For further details on the full range of services offered by the Institute of Estuarine and Coastal Studies, please contact:

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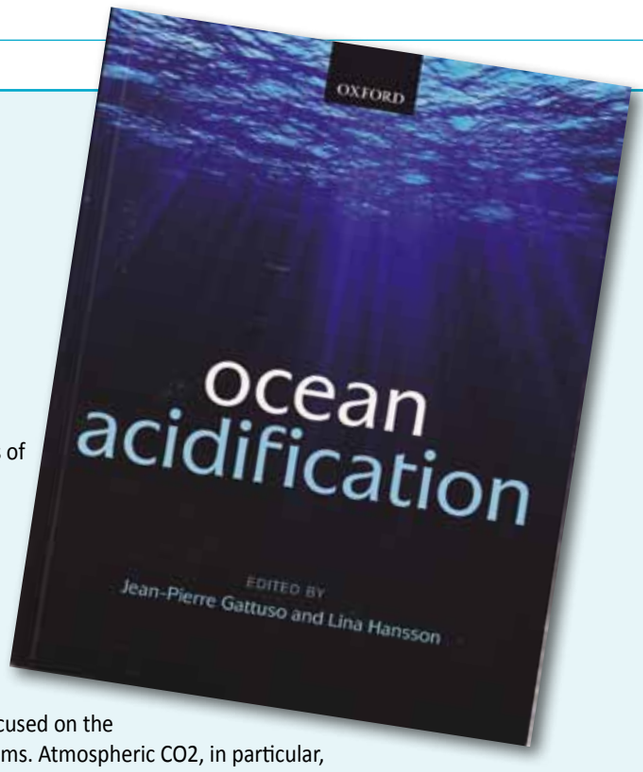
ECSA 51th International Symposium

Klaipeda, Lithuania, September 23–27, 2012

This ECSA (Estuarine & Coastal Sciences Association) international symposium will be co-organized by the Coastal Research & Planning Institute of the Klaipėda University (CORPI), Baltic Lagoon research Network (BALLOON), Lagoons Federation/Euro-Mediterranean Lagoon Federation (EUROMEDLAG)

Ocean acidification



Edited by Jean-Pierre Gattuso and Lina Hansson

Oxford University Press (2011)
326pp

Review by J.-P. A. Ducrotoy

Changes in climate (e.g. temperature rise, sea-level rise, increased risks of floods and droughts) may increase the risk of abrupt and non-linear changes in many ecosystems, which would affect their composition, function, biodiversity and productivity. When subjected to climate change, including changes in the frequency of extreme events, ecosystems may be disrupted as a consequence of differences in response times of species. In recent years, there has been an upsurge of interest in climate change impacts in marine systems, but most of the literature has focused on the effect of temperature and most work is conducted at the level of individual organisms. A few studies have focused on the impact of greenhouse (effect) gases directly on organisms and ecosystems. Atmospheric CO2, in particular, is generally considered the most important greenhouse gas. However, most of anthropogenic CO2 will enter the ocean, where it normally reacts with carbonates and borates. Carbonates play an essential role in the biology of marine organisms as they are found in the tests of microorganisms, exoskeleton of invertebrates and endoskeleton of vertebrates.

The book "Ocean acidification" is edited by Jean-Pierre Gattuso and Lina Hansson, both from the French CNRS (Centre National de la Recherche Scientifique, Villefranche-sur-Mer). The book covers much more than just the ocean carbonate chemistry which is treated in three of the 15 chapters of the book, each written by different authors from research organisations from all around the world: USA, Canada, UK, France, Germany, Switzerland, Japan, Vietnam, etc. The value of bringing together specialists from such a variety of institutions means that all aspects of ocean acidification could be covered. However, as often in this kind of collection of articles, there is some heterogeneity in style and quality of text.

The 16 papers are organised in a sequence, starting with the recent history of changes in environmental CO2 chemistry. Looking at the background situation in the pre-industrial age up to present through an historical approach, the introductory chapter hints at the role of chemistry and its possible effects on biological and ecological processes. Useful definitions are given alongside a bibliometric analysis and considerations for policy implications. The three next chapters are devoted to chemistry, linking oceanic water quality to organisms with skeletons. Then, the potential biological effects are presented on benthic, pelagic and nektonic animals and plants. The authors explore how organismal responses to perturbations of the carbonate system could scale up to affect ecosystem structure and functioning, including biodiversity and marine resources. Putting together this information leads to an analysis of the biogeochemical consequences for the earth system. The last three chapters bring in socio-economics and focus on risks for humanity, notably in places where acidification acts synergistically with other stressors. In addition to climate change, coastal ecosystems such as polar seas, coral reefs and deep sea environments are naturally subjected to a variety of anthropogenic stressors which can damage the health and fitness of the resident organisms. In estuaries, multiple stressors include pollutants, excess of nutrients (e.g. eutrophication), altered habitat and hydrological regimes as well as floods and droughts. These can impact resources through single, cumulative or synergistic processes, lowering the overall system stability.

Anthropogenically induced global climate change has profound implications for marine ecosystems and the economic and social systems that depend upon them. The book shows that both abiotic changes and biological responses in the ocean will be substantially more complex than previously thought. Responses of biota to environmental stressors are the integrated result of both direct and indirect processes which can be manifested as changes in abundance, diversity and fitness of individuals, populations and communities.
The iconography of the book is of unequal quality and one may regret that all diagrams were not reproduced in colour. The ones which use colour are really crisp and will probably become classics for teaching. The same remark applies to boxes which summarise important topics in some chapters. They ease greatly the reading of complex texts. Unfortunately, some chapters did not benefit from the same treatment and they are less accessible.

Overall the book has great value in giving an up-to-date overview of scientific research on acidification and will be useful to most colleagues working in oceanic and coastal ecology. Students and managers who wish to get to the core of the matter will find there a robust and well-documented compilation of articles covering a whole range of approaches. In brief, this is indispensable reading for anyone interested in marine ecology.

Stay connected ECSA e-news

ECSA electronic newsletter (e-news) is a service dedicated to ECSA members. It is an easy and rapid way to spread information to the ECSA community, advertising for any events, courses, fellowships/job positions, etc. in the field of estuarine and coastal sciences.
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Photo: J-P Ducrotoy

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The *ECSA Bulletin* is distributed to all members, free of charge, twice a year; this is supplemented by newsletters and association information and links are updated regularly on the ECSA website. The association has a small grants scheme for younger scientists.

Further details and memberships forms from:

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