ECSA Bulletin No 63 Summer 2014

ECSA Bulletin

Bulletin of the Estuarine & Coastal Sciences Association

Le Hourdel, France 2012 - Photo J-P Ducrotoy

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

www.ecsa-news.org

ISSN: 1352-4615

Cover photograph: Jean-Paul Ducrotoy

This newsletter was edited by
Jean-Paul A. Ducrotoy
Institute of Estuarine and Coastal Studies
The University of Hull
Hull HU6 7RX, United KIngdom
T: +33 (0)322 238 074
E: jean-paul.ducrotoy@hull.ac.uk
with thanks to all contributors.

ECSA Bulletin

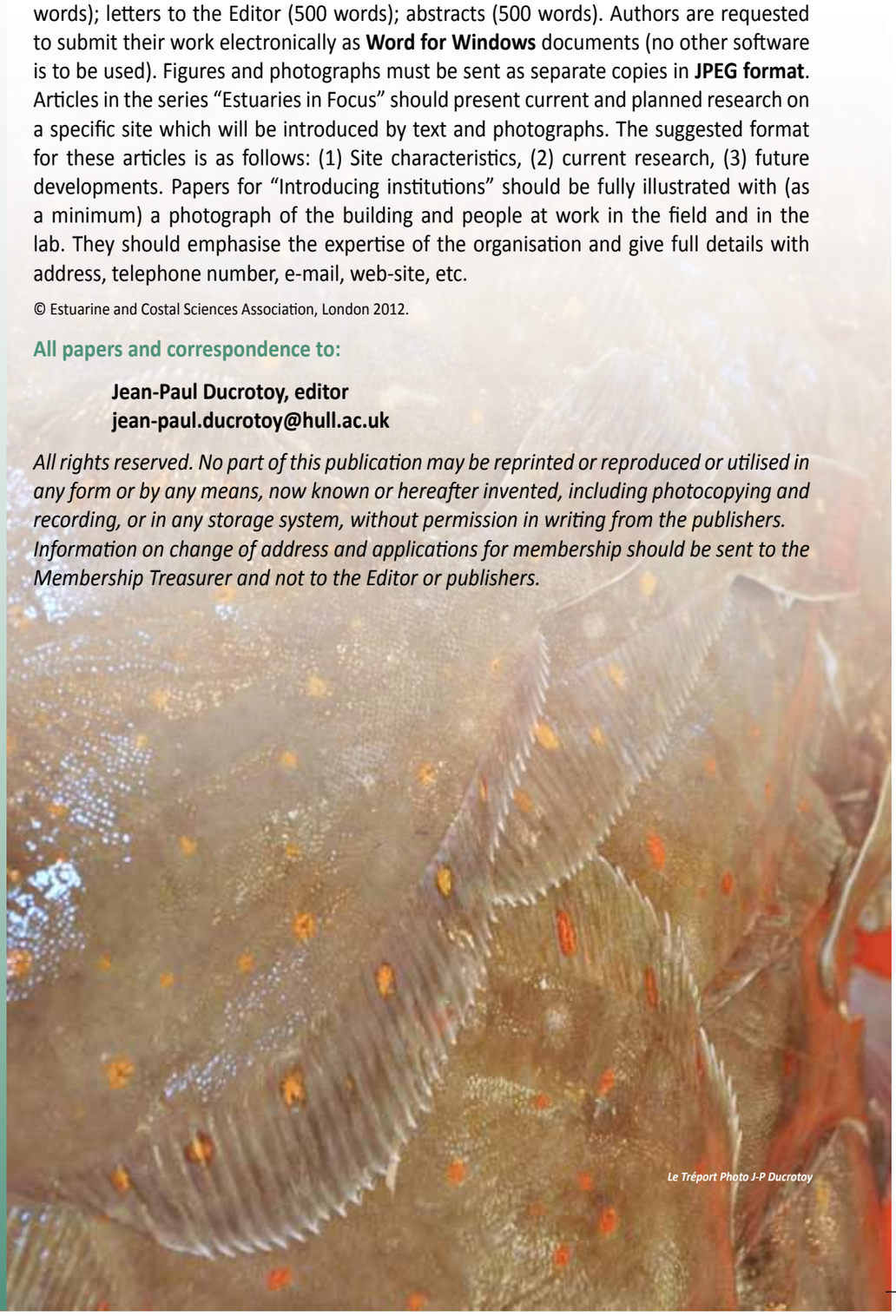
Instructions to authors

The ECSA Bulletin is issued in JANUARY and JULY. Articles, reviews, notices of forthcoming meetings, news of personal and joint research projects, etc. are invited and should be sent to the Editor. Closing dates for submission of copy (news, articles, notices, reports, etc.) for the relevant numbers are **15 November** and **15 May**. These dates will be strictly adhered to in order to expedite publication. Articles must be submitted at least ***5 weeks before*** these dates in order to be edited and revised in time for the next issue of the Bulletin; otherwise they may appear in a subsequent issue. Authors are encouraged to consult an earlier issue of the Bulletin and adhere to the style of the publication.

Suggested word limits are as follows: obituaries (1500 words); articles (3000/4000 words); reports on meetings (2000 words); reports on ECSA grants (1000 words); reviews (1500 words); letters to the Editor (500 words); abstracts (500 words). Authors are requested to submit their work electronically as **Word for Windows** documents (no other software is to be used). Figures and photographs must be sent as separate copies in **JPEG format**. Articles in the series "Estuaries in Focus" should present current and planned research on a specific site which will be introduced by text and photographs. The suggested format for these articles is as follows: (1) Site characteristics, (2) current research, (3) future developments. Papers for "Introducing institutions" should be fully illustrated with (as a minimum) a photograph of the building and people at work in the field and in the lab. They should emphasise the expertise of the organisation and give full details with address, telephone number, e-mail, web-site, etc.

All papers and correspondence to:

Jean-Paul Ducrotoy, editor
jean-paul.ducrotoy@hull.ac.uk



Le Tréport Photo J-P Ducrotoy

Editorial ECSA 63

Global change and estuaries

Estuaries are highly dynamic ecosystems and are affected by temporal and spatial pressures from anthropological origin, in particular the current climate change.

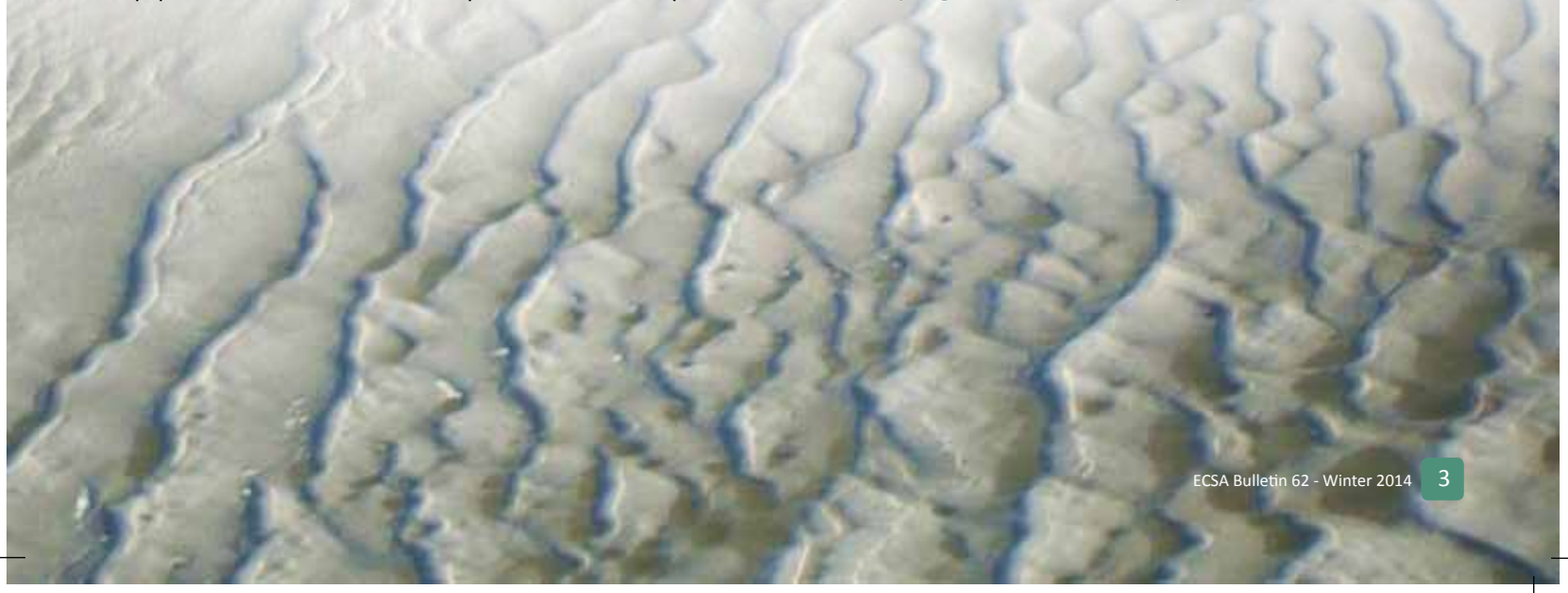
From an ecological and managerial point of view, estuaries cannot be assimilated to other coastal features because their biological attributes and functionalities are specific to them. Estuaries are dynamic links between the atmosphere, the mainland (including underground fresh and salt water) and the marine environment. Current knowledge must be confronted to rising sea levels and its influence on the regime of tides, waves and hydrodynamics. They are at the forefront of the coming changes. At European level, it is a vital importance to understand how estuaries are responding to geomorphological change in order to adapt measures to unexpected evolutionary trajectories. It is useful, in particular, to clarify and identify the elements which respond preferentially to new climatic conditions and their possible effects on the dynamic physical and biological characteristics of the ecosystems considered. Estuaries themselves differ by order of magnitudes in terms of size, yet they all have common properties and process.

Current changes in climate (e.g. temperature rise, increased risks of floods and droughts, precipitations, UV radiations alteration, water acidification, atmospheric gas balance...) are increasing the risk of abrupt and non-linear changes in estuarine ecosystems, which will affect their composition, function, biodiversity and productivity. Let us keep in mind that most estuaries are tidal. The effect of rainfall in intertidal area, for instance, is crucial to be understood on invertebrate and plant population dynamics. At local level, deflocculation/flocculation processes are an important factor governing the abundance and quality of sediments. An intensification in this phenomenon may lead to higher SPM values so tidal marsh would faster switch towards a “climax” vegetation state. Despite limited plant diversity such a move might enable tidal marshes to follow up the increase in MHWL which has to be considered favourable for coastal protection. However, elevated CO2 concentrations could become a problem for salt-mash plants triggering an unsustainable loss of water. In parallel, tougher solar radiations (UV-B) might inhibit photosynthesis.

Overall, when subjected to climate change, including changes in the frequency of extreme events, estuarine ecosystems may be disrupted as a consequence of differences in response times of species. At regional level, often, the emphasis is put on habitat change to the advantage of some invasive species (i.e. rotifers) which can benefit from new and more favourable conditions to move into temperate waters. This is to be understood in terms of displacement of species being at the origin of population redistribution. Shifts in spatial distribution of species and the success of some alien species relies on the current breakdown in geographical barriers. In any case, climate change will make “habitats of interest” more fragile and less resilient

All around the world, environmental legislation has been developed by states and international organisations such as the UN. Conventions and various agreements between countries exist in relation to pollution and the use of natural resources. Many challenges in implementing such a complex diversity of regulations and laws still need to be addressed. The general approach consists in determining current status, defining what should be the status under reference conditions, assessing if there is a difference and if so then indicating and implementing the measures to correct problematic situations. Unfortunately, climate change has made any going back to an illusory pristine past situation impossible. In order to clarify the sensitivity to contemporary global change, specific approaches are needed. Among the measures other than those provided by the current legislation (the WFD – Water Framework Directive - for instance in Europe), basic and cheap measures might work (so called ecological quality objectives), i.e.: quiet rest areas for mammals, feeding areas of intertidal habitat for birds at low tide, or the creation of nesting sites suitable for birds. The main challenge is to find an approach mutually beneficial and harmonizing objectives and measures of the various pieces of legislation from regional, national to European and international. To attain such a multiscale approach, research funded at local and regional level is to be developed. Managers should realise that each estuary is unique and needs special attention. There are no ready-made solutions, but only adaptations on a case by case basis will be fruitful.

Climate change is just one aspect of global change. Geo-politics changes are also accelerating. The media, often without discernment, keep telling us about political up-avails all around the world. Managing such radical changes need appropriate knowledge on the influence of climate change on reference conditions, pressure responses or the recovery of estuarine ecosystems - after the removal of pressures. As scientists, we need to focus on functioning at ecosystem level (goods and services) rather than on structure to promote local actions in harmony with the societal demand. Science fiction is required. Let us look ahead and shape an utopian vision of estuaries to 30 or 50 years. We need to be imaginative and take risks in our endeavours. Conservation and protection should not be mistaken for “fossilised” biotopes. One question is whether to concentrate on hot spots of biodiversity, or deal with “cold spots” where most of humans live. In estuaries, interactions are to be understood in terms of morphology, sedimentology and chemistry (silting, transportation, erosion, adsorption, hypoxia areas... – sinks and source of pollutants), but human activities need to be considered as fully belonging to the ecosystem. Social scientists and anthropologists are our unavoidable partners in this venture.



View from the Chair

Dear Colleagues,

A cornerstone of the Association is its desire to arrange meetings, conferences, symposia and workshops to promulgate the latest scientific developments in estuarine and coastal science, technology and management. This ambition would not be possible without the support and commitment of our scientific community across the world many of whom are keen to arrange various gatherings where the latest research findings can be discussed. To this end the Association was able to hold two meetings this year.

In April 2014, an excellent local meeting was held on "The Estuaries and Coasts of North Wales" at the University of Bangor. Local meetings are an important component of the portfolio of events supported by the Association but they all require substantial commitment in time and effort to be successful. On behalf of the ECSA Council I express our great appreciation of the work of Shelagh Malham and Suzanne Jackson from the School of Ocean Sciences, Bangor University who helped put the programme together and contributed significantly to the domestic arrangements. We are also grateful to Professor Colin Jago, Dean of the College of Natural Sciences, for his unflagging support for this initiative. Local meetings are largely successful because of the efforts of the ECSA Local Meetings Organiser, Andrew Wither, and the Association expresses its gratitude for his diligent work.

An international conference on "Coastal Systems under Change: Tuning Assessment and Management Tools" was held in Sesimbra, Portugal between 12 and 16 May 2014. The development of the conference was led by Professor Henrique Cabral from the Centro de Oceanografià, University of Lisboa, who was ably assisted by members of the Scientific Committee Lucia Guilhermino, João Carlos Marques, Mike Elliott and Victor de Jonge. There was a full scientific programme covering topics from hydrodynamics, geochemistry, biodiversity and ecosystem functioning, effects of global change, conservation management and management decision-making. Again the Association expresses its appreciation to the organising committee for their efforts to make the Conference an outstanding success.

The Council is now preparing for the 2015 conference season and members can be assured that we are developing initiatives for next year within the European arena. Our planned activities will be notified the ECSA Bulletin and via the ECSA website. While on the subject of the Bulletin our Editor, Jean-Paul Ducrotoy, welcomes contributions from members in particular for the sections "Estuaries in Focus" and "Introducing Institutions". These offer opportunities for members to broadcast their work to the international readership of the ECSA Bulletin. The Bulletin is produced twice a year and members wishing to submit articles can do so by sending them to Jean-Paul, j-p.duc@wanadoo.fr, by the beginning of May and November. Thanks for your support in providing articles of interest.

Best wishes,

Geoff Millward - President of ECSA

Le Hourdell - Photo J-P Ducrotoy

Lochinver - Photo J-P Ducrotoy

Professor Laurence David Mee: Obituary


Laurence Mee 2013

Born: Ipswich, 14 February 1951

Died: Inverness, 13 August 2014

Laurence Mee began his scientific career at the University of Liverpool where in 1974 he graduated with a BSc (Hons) in Chemical Oceanography. He pursued his interest in the subject by conducting a PhD research programme, in Liverpool, on the "Chemistry and Hydrography of Mexican Lagoons" under the direction of Mohamed Abdullah and the father of modern Chemical Oceanography, Professor John Riley. He obtained his PhD in 1977 and took up a research post at the National Autonomous University of Mexico where he was based for the next 10 years, initially in Mazatlán and later in Mexico City. During that time he was involved in the designing of the oceanographic research vessel El Puma. In 1987 he was appointed as Head of the Marine Environmental Studies, at the International Atomic Energy Agency laboratory in Monaco. From 1993 to 1998 he was a prime mover, and founding coordinator, in the Global Environmental Facility where he played an important role in formulating the Black Sea Programme, a major research initiative that occupied his attention for many years. In 1998 he was appointed as the Pew Fellow in Marine Conservation, an honour that he held until his death.

Subsequently, he became a Visiting Professor at the University of Plymouth, combining this role with his activities as a Senior Consultant at the International Centre for Water Studies in the Netherlands. From 2000 to 2008 he was Professor of Marine and Coastal Policy at the University of Plymouth and in 2005 became the first Director of the newly-formed Marine Institute at the University. He built the reputation of the Marine Institute through his ability to unite interdisciplinary scientific groups. In 2007 he was a Special Advisor to the House of Commons Select Committee on Science and Technology Inquiry on Investigating the Oceans. His work with MPs and government officials contributed to bringing the Marine Bill to the Statute Book. In 2008 he was offered the Directorship of the Scottish Association for Marine Science where he worked until his untimely death on 13 August 2014 following a stroke. Under his directorship SAMS significantly expanded its education provision and the 'Sheina Marshall Building' is a physical legacy of his leadership. He played an important role in the formation of the University of the Highlands and Islands where we worked towards growing research excellence.

Throughout his career Professor Mee has worked with nationally and internationally-renowned marine scientists because he was a superb catalyst for building research consortia. He produced many publications in journals and books and he was member of Scientific Committee for Land-Ocean Interactions in the Costal Zone (IGBP-LOICZ). He is best known for his research papers identifying the ecological crises in the Black and Caspian Seas, particularly for the UNEP. He was the leader of major European research projects, such as the €2.5 M project on "European Lifestyle and Marine Ecosystems (ELME)" and recently the €5.7 M EU-funded project on "Knowledge-based Management of Europe's Seas (KNOWSEAS)". Consequently, there is no doubt that Laurence Mee was a major intellectual force in the unification of socio-ecological systems for the marine environment.

Personally Laurence was an ideas person who focused on the big picture and characterised by endless enthusiasm and joie de vivre. He was one of the great characters in Marine Science, a huge supporter of the Estuarine and Coastal Sciences Association and he will be dearly missed by his many colleagues across the globe.

Professor Axel Miller
Acting Director of SAMS and member of ECSA Council


Laurence outside Sheila Marshall Building SAMS


Laurence diving


Laurence sailing - July 2014

Studying with the polar bears

27th April to 6th June 2014

About an hour after taking off from Oslo during spectacular sunset, I experienced my last sunrise for 6 weeks. Later, when I stepped out of the plane, just after midnight, it was still light but cold (about -10 °C) at the end of April. I had arrived in Longyearbyen on Svalbard to attend a PhD course at the University Centre in Svalbard (UNIS). Longyearbyen is the world's northernmost town, located at 78°N at the shore of Adventfjorden and has about 2,000 permanent residents. It was established in the early 20th century as coal mining town. Polar night lasts from end of October to mid-February, midnight sun from mid-April to late August. The average winter temperatures are around -15°C and in summer temperature rises to about +5°C. The town is covered in snow from late September to early June. UNIS is specialised on Arctic studies and offers short courses (4 weeks – 1 semester) on undergraduate and postgraduate level. During my stay in Svalbard I attended the 6 weeks course on 'Light climate and Primary Productivity in the Arctic'.

My PhD is about the development and improvement of methods and instruments to measure inherent optical properties (IOPs) of marine waters. IOPs, such as absorption, attenuation and backscattering, provide useful information on the concentration and distribution of natural constituents, e.g. minerals, dissolved organic materials and phytoplankton. The presence of these constituents strongly influences the light climate under water, i.e. how deep a certain wavelength penetrates the water. Phytoplankton and macroalgae can harvest light and utilize it for photosynthesis and growth. During the UNIS course I learnt how the physical properties of light affect the photo-biology of algae. The lectures included theory on different algal classes and pigment groups (taxonomy), ecology, adaptation and acclimation to changing light levels (physiology) as well as the effects of variation in key environmental parameters, such as nutrients, temperature etc. All topics were discussed on background of the specific characteristics of the ecosystem Arctic Ocean. The course coordinator, Prof. Geir Johnson (NTNU), emphasised that the light climate with its strong seasonal variation is by far the most extreme environmental variable in Svalbards' aquatic ecosystem.

The lab/field work of the course was conducted in Ny-Alesund, a research base located at Kongsfjorden. We got to spend a week in the former mining village that is now a centre for Arctic research for over 6 different nations. We set up our equipment in the facilities of the Marine Lab and were able to use the great local infrastructure to make the most of our week. Phytoplankton samples were collected with a plankton-net on board of RV Theissen. We collected macroalgae from the littoral zone of Ny London, Blomstrandoya, with a rake. Therefore we had to stand the bay with the cold water above our hips wearing bright orange floating suits. Samples from larger depths were collected by divers. We collected over 20

The Biology students enjoying an Arctic bath in Kongsfjorden just after midnight. Water temperature around +2°C.

On the flight from Longyearbyen to Ny-Alesund

microalgae and 21 macroalgae species in total. Furthermore we measured depth profiles of temperature, salinity, Chlorophyll a fluorescence and turbidity. Diurnal changes in these parameters (plus irradiance) were monitored with a mooring that was deployed at 3 m depth for 2 days. In the lab, we tried to identify different algae species using various microscopy methods, to distinguish between different pigment groups using pigment absorption spectra.

The main focus of the course and lab work was on the estimation of photosynthetic rates derived from different variable fluorescence measurements. I gained knowledge on the different techniques currently used in the field and understood in depth how the photosynthetic apparatus works. In addition, learnt how the physical parameters we measure back in Scotland are linked to algal physiology and how they can provide information about biological processes.

The course was an opportunity to not only gain valuable training in support of future fieldwork, but also a chance to establish links with other students interested in the interaction of light with the ocean and organisms within. The experience of living and working in such a remote and intriguing environment was (potentially) a once in a lifetime experience and I feel it was most valuable and gave me a few ideas where to take my PhD and future research.

My only disappointment with the trip? Not seeing a polar bear. Maybe next time!

Me sampling macroalgae in Blomstrandoya

After a hike up Sarkofagen in thawing conditions Longyearbyen and Adventfjorden in the background

ECSA53 experience – Faith Chan

First of all, I would like to express my appreciation to the board of ECSA, such as Prof. Geoff Millward, etc. I feel very thankful as they have invited me to apply the free registration scholarship competition for the ECSA53 conference (Estuaries and coastal areas in times of intense change conference 13-17 October, Shanghai, China). I am very pleased to be granted and provided me for presenting my latest research findings to many international scholars during the event and have had such a great experience. I also would like to take the chance to thank Prof. Martin Wilkinson, Dr. Mark Fitzsimons, Dr. Victor de Jonge and Dr. Clare Scanlan for their administrative assistance.

The rapid socio-economic growth and human-induced effects in China, extendable to the whole East Asian region are dramatically influencing the coastal environment. Intensive urbanization has brought emerging challenges from river catchments to estuaries, deltas and seas, the conflicts and impacts on natural coastal phenomenon are important to address. This conference was taken place at Shanghai, the mouth of Yangtze River Delta, which is the 3rd largest river in the world, and I have been experienced that this conference has given such a good location for some substantial in-depth discussions for a wide range of mega-scale impacts on coastal ecosystems. Such as, understanding the functions of estuarine and coastal areas, latest research findings on coastal geomorphological, physical and ecological dynamics, and finally for some fruitful foresights on management on future development tools, strategies and governance system to manage coasts.

The LOICZ East Asia session that was led by the Chinese Academy of Science, Yantai Institution of Coastal Zone Research, the LOICZ IPO office and East Asia node, the State Key Laboratory of Estuarine and Coastal Research (SKLEC) of East China Normal University (ECNU), was particularly impressed me. This special Yantai Node session provided delegates some special focus, prolific ideas, understandings and discussions from the Yellow River Delta (YRD) and Bohai Region. The YRD coastal environment is currently facing emerging challenges on numerous of problems, such as over-extraction of groundwater to enhance extensive land subsidence, equally the flood risk is increased as large scale of settlement has located on the coast, also with frequent cyclonic effects and climatic change effects on top with that. Fast developments also cause water pollutions in the catchment and pollutants accumulation on estuarine and bay areas. As a result, this session was a very good case to indicate some common effects on many deltaic and coastal regions in the world. More importantly, it merged with all rest sessions in the conference and voiced out the necessity for managing the river mouths and coastal region in a sustainable way from now on.

Furthermore, I did learn a lot from all inspirational key-noted speeches, some of them specifically hooked up with my interests. For example, Prof. de Groot on the latest conceptual theories on using eco-system services to give some answers on social-economic effects on coastal development. Prof. de Jonge's findings also reminded me the importance on integration of governance to handle such complex problems in the changing marine environment. The speech from Prof. Ding to highlight the environmental evolution of Chinese largest river deltas of Yangzte, Yellow and Pearl were fantastically given all delegates for such drastic changes of the estuarine environment, such as saltwater intrusion, sediment flux, and frequency of red tides and eutrophication. I am interested on sustainable coastal management in the East Asian Deltas, all of these latest findings and insights did help me to understand the bigger picture on how to manage our coasts.

Lastly, I would like to appreciate the board also invited me to chair a session with Dr. Mark Baird for a session, I am grateful to meet and connect with Mark. In fact, I had to give my presentation on the chaired session, but also had other commitments that left him to chair the rest of session, but he was very generous to help me, really thankful to him and the board of ECSA53. Of course, all valuable comments to my research findings, all networks and friendships that has established, will definitely remain the most cherished additions to my experience through the ESCA 53 conference. I hope to further engage with the ECSA and sustain my footpath to join the upcoming ESCA c onferences in the nearly future.

Faith Chan
Assistant Professor in Physical Geography,
Department of Geographical Sciences, University of Nottingham,
Ningbo Campus
Email: faith.chan@nottingham.edu.cn

Report from the 10th International Temperate Reef Symposium

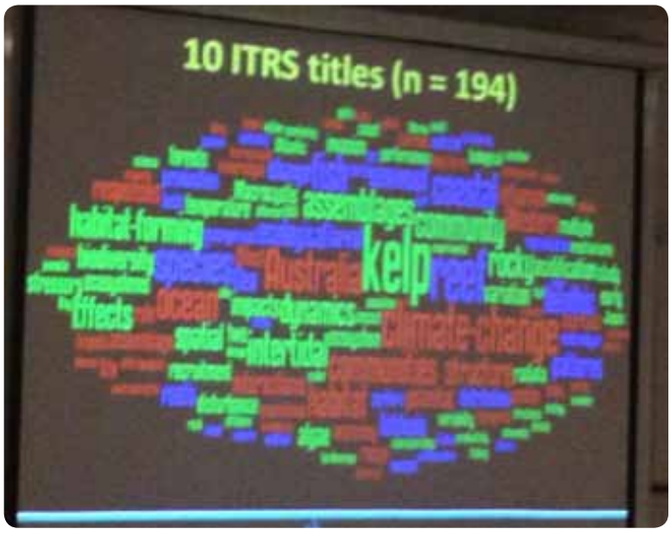
The International Temperate Reef Symposium is the premier conference for marine scientists whose research focuses on temperate hard-bottom habitats. The meeting has a broad scope and welcomes research on natural rocky reefs, man-made structures and biogenic surfaces from a wide variety of disciplines.

This year the meeting was held at the University of Western Australia in Perth from the 12th-17th of January. The meeting included over 250 oral and poster presentations, as well as a series of plenary sessions. The research presented ranged from intertidal ecology to citizen science, within the overarching theme of 'Ecological Transitions'. The global scope of the conference was evident from the 24 countries represented by delegates. Two 'casual plenary' sessions gave senior reef ecologists a platform to share their personal perspective on trends and changes in temperate reef ecology over the last three decades, while the audience sampled the hand-crafted beer, brewed especially to celebrate the 10th ITRS. The meeting prides itself on its excellence provision for students and first-time attendees and this year's meeting was no exception, with students making up 45% of the delegates.

At the conference, I presented the results of experiments on understanding drivers of benthic productivity on artificial structures that form part of my PhD project. The presentation was part of the 'Human Impacts' session, which included other talks particularly pertinent to my research. The presentation was very useful in facilitating my engagement with other researchers working on artificial substrates, both in the UK and Australia. This was the first time that I had presented the results of my work and the feedback and input from other reef ecologists was very valuable in planning the next steps of my PhD.

I also presented a poster on a continuing project to develop an artificial grass sediment trap to measure food supply to organisms that live in benthic boundary layers. The poster was well received and it led to some interesting discussions on other potential applications of the sediment traps. After the conference I was lucky enough to join a diving trip to Rottnest Island, just off the coast of Perth. This was a great opportunity to see the local temperate reef habitats and species that I had heard so much about at the conference. Overall, I found the conference to be a very beneficial experience. I enjoyed meeting students and researchers from my field and sharing my work with an international audience.

I would like to thank to the Estuarine and Coastal Science Association for awarding me a Charles Boyden Small Grant, which enabled my attendance 10th ITRS.



Word cloud of titles presented at the 10th ITRS

Presenting the ressults of my experiments on benthic productivity on artificial structures

ECSA Local Meeting University of Bangor, April 2014

In April 2014 the ECSA United Kingdom local meeting was held at the University of Bangor University in North Wales. The scientific content followed an established pattern for such meetings that became an annual feature soon after the formation of ECSA more than 40 years ago. Local meetings were conceived to bring together scientists from universities, research institutes, environmental consultancies, marine planners and staff of statutory regulating organisations for co-ordinated discussions of the problems and perspectives concerning the preservation and future management of estuarine and coastal areas.

At Bangor meeting the area under scrutiny was the coast of North Wales and its estuaries, particularly the Dee, Dovey and Conwy. There were many excellent scientific presentations including from the School of Ocean Sciences who spoke on their current research and from the newly-formed statutory body, Natural Resources Wales, which combines pollution control and fishery functions of the former Environment Agency Wales and the conservation functions of the Countryside Council for Wales. Colleagues from Natural Resources Wales demonstrated the success and breadth of their approach, particularly the use of high quality scientific information to support their management activities. Following the exceptional weather which the North Wales coast had suffered in the winter 2013-2014 delegates heard much about flooding and the damage to the coast of Wales and how this was being protected, taking many environmental considerations into account.

The meeting was rounded off by a lively afternoon workshop, led by Professor Mike Elliott, which brought together the different disciplines and organisations at the meeting to answer the question “How do we know at what point estuaries and seas are healthy?”

The Association is indebted to Drs Shelagh Malham and Suzanne Jackson from the School of Ocean Sciences, Bangor University who worked tirelessly to put the programme together and ably assisted with the domestic arrangements. We are also grateful to Colin Jago, Dean of the College of Natural Sciences, for his constant support. The meeting was conceived by Andrew Wither, ECSA Councillor and the Local Meetings Organiser, and the Association greatly appreciates Andrew’s efforts in bringing the meeting to fruition.

Professor Martin Wilkinson
Heriot Watt University, May 2014

Honfleur 2013 - Photo J-P Ducrotoy

Forthcoming Events

We are very pleased to announce that ECSA 55 will be held in London on the 6-9th September 2015. Entitled 'Unbounded boundaries and shifting baselines', ECSA 55 brings together a global multi-disciplinary community of researchers and professionals to discuss and address issues of outstanding scientific importance in the science and management of estuaries and coastal seas in this rapidly changing world.

ECSA 55 will focus on learning lessons from the past, discussing the current and forecasting for the future, spanning environmental, anthropogenic and climatic impacts on estuaries and coastal seas across the globe.

ECSA 55 will be held at the ExCeL London Exhibition and Conference Centre on the banks of the Thames Estuary, a heavily modified, industrial megacity estuary. As with all megacity estuaries, the Thames is a valuable resource which faces competing, and often conflicting socio-economic and environmental demands. The need to balance these demands in a complex environment, whilst confronting the consequences of climate change, requires innovative multi-sectoral management approaches based on excellent and fit-for-purpose science.

Conference streams:

- **People and coasts through time.**
- **Biology and ecology of coastal and estuarine systems: evolution, adaptation and shifting baselines.**
- **Physical and chemical processes in estuaries and coasts: geochemical, sedimentary, hydrodynamic and geomorphological change.**
- **Interactions between biological, geochemical and physical processes: fluxes and functions.**
- **Valuing estuaries and coasts: Shifting social, economic and cultural perspectives.**
- **Managing challenges: Working towards resilient and sustainable coasts and estuaries.**
- **Estuaries and coasts in the future: Prediction and adaptation.**
- **The challenges of heavily modified, industrialised megacity estuaries.**

Propose a special session

We are inviting delegates to propose and convene special organised sessions for ECSA 55. Selection of session proposals will be highly competitive and priority will be given to sessions which address the overall ECSA 55 theme, fit within the conference streams and are at the cutting-edge of current estuarine and coastal science.

We encourage innovative sessions and formats including, but not restricted, to oral presentations, posters, workshops, practitioner forums, panels and discussions. Session timeslots can be flexible to accommodate alternative formats.

Sessions may be sponsored by relevant institutes, organisations and research groups (see sponsorship section), however sessions do not need to be sponsored in order to appear in the programme. Special session organisers will participate (along with the ECSA 55 Scientific Committee) in soliciting and selecting session contributions.

Completed session proposals should include details of the conveners, a session title and a brief description of the session content (in no more than 200 words). This description must highlight how the session addresses the overall conference theme and why the session is of critical importance to the estuarine and coastal scientific community.

The deadline for proposing a session for ECSA 55 is **Monday 3 November 2014.**

Please send your completed session proposal to the ECSA conference coordinator at **Sally.Little@hull.ac.uk.** If you have any questions about proposing a session for conference, please contact the same address.

***Please note that the cost of convener and speaker/presenter attendance in accepted special sessions will not be covered by ECSA 55.**

Sponsorship

ECSA welcomes symposia sponsorship by relevant institutes, organisations and research groups. Sponsorship normally consists of branding the whole symposia, a session, award and/or prize. Notable examples from previous symposia include best student oral and poster presentations in selected sessions.

If you are interested in sponsoring ECSA 55, please visit the conference website (www.estuarinecoastalconference.com) for more information.

We look forward to seeing you next year in London for ECSA 55!

For more information, please visit: www.estuarinecoastalconference.com

Conference Chair

Dr Sally Little, ECSA Conference Coordinator, Institute of Estuarine and Coastal Sciences, University of Hull, UK

Scientific Committee

Dr Sally Little, ECSA Conference Coordinator, Institute of Estuarine and Coastal Sciences, University of Hull, UK.

Prof Victor de Jonge, Editor-in-Chief Ocean & Coastal Management, Institute of Estuarine and Coastal Sciences, University of Hull, UK.

Dr Kate Spencer, ECSA President-Elect, School of Geography, Queen Mary, University of London, UK.

Prof Mike Elliott, Editor-in-Chief Estuarine, Coastal and Shelf Science, Institute of Estuarine and Coastal Sciences, University of Hull, UK

SYMPOSIUM

Restoration of estuarine environments, the example of the Seine estuary

Reconciling environmental issues and development challenges

27 & 28 May 2015

Date and place

Wednesday May 27 and Thursday, May 28, 2015 in Le Havre, France

Co-organisers

Grands Ports Maritimes du Havre et de Rouen. The Grands Ports Maritimes (GPM) of Le Havre and Rouen are located in the Seine Estuary, Normandy, France. They were established according to a national redeployment of ports launched by the French government in early 2008. Within the limits of their districts the Great Seaports are responsible for the following main tasks:

- **Construction, operation and maintenance of maritime access and development and management of industrial and logistics areas related to port activity;**
- **Police, safety and security;**
- **Land management and development of owned or assigned properties and management and conservation of public natural areas under their jurisdiction;**
- **Construction and maintenance of port infrastructure;**
- **Promotion of the provision of rail and river routes in cooperation with operators concerned.**

ECSA, the Estuarine and Coastal Sciences Association. ECSA is an international organisation dedicated to the promotion of multidisciplinary research in estuarine and coastal areas, particularly science and technology for environmental management. The association organizes many international seminars and conferences to disseminate results of ongoing research.

Convened by GPMH with the support of GPMR, the symposium falls in the series of ECSA "local meetings". The technical and scientific experience of the association will ensure the scientific quality of debates.

Context

The Seine estuary is one of the three largest estuaries in France with the Loire and the Gironde. This vast wetland of nearly 10 000 hectares includes a set of typical estuarine habitats, all protected as outstanding at European level: subtidal areas, mudflats, salt marshes, ponds, reed beds, wet meadows, at the interface between the atmosphere, land and sea These natural areas are developing into a major migration route for birds.
In support to this ecological potential, several protection policies are in place at European level and regional level:

- **Natura 2000 and its Special Protection Area for Birds;**
- **The Nature Reserve of the Seine Estuary, one of the largest reserves of France;**
- **The Regional Natural Park "les Boucles de la Seine".**

The Port of Le Havre is located in this rich and diverse estuarine environment and the balance between the development of industrial and port activities and the preservation of a both rich and fragile ecosystem needs to be looked after on a permanent basis.

With more than 50 million € dedicated to environmental measures, Port 2000 is part of a genuine policy of sustainable development in the Seine Estuary. Defined in close consultation with all stakeholders in the area and implemented from 2000, these environmental measures are at the origin of a process of environmental rehabilitation of the estuary of the Seine. It is now time to share such innovative environmental actions in order to help enhancing the knowledge gained on estuarine restoration. The meeting will be an opportunity for those working around the Seine to learn from workers elsewhere and vice versa.

Conference Objectives and target audience

The purpose of this symposium "Restoring estuarine environments, the example of the Seine estuary" is, firstly, to review Port 2000 environmental measures, and to introduce other ecological restoration measures which have followed for almost 15 years. Feedback from stakeholders will contribute to sharing scientific and technical information gained through the implementation of these actions. Secondly, the symposium will open onto discussing broader issues such as restoring estuarine ecosystems relying on prospective studies in the context of global change and sustainable management methods pertaining to estuaries of international importance.

Target audience:

- **Scientists working on estuaries (geomorphology, sedimentology, ecology, socio-economics, anthropology...) at regional, national and international level;**
- **Local communities - managers, associations, administrations...**
- **Educators and facilitators**

Themes

- **Estuarine restoration**
- **Estuaries and Climate Change**
- **Sustainable management of estuaries of international importance: reconciling environmental issues with developmental issues.**

- Nacima Baron-Yelles, Chair of the Program Advisory Board LITEAU

The Scientific Committee is responsible for selecting presentations and elaborating the final program following the call for communications.

Technical considerations

Languages

The official languages of the conference are French and English. Simultaneous translation will be provided.

Call for papers

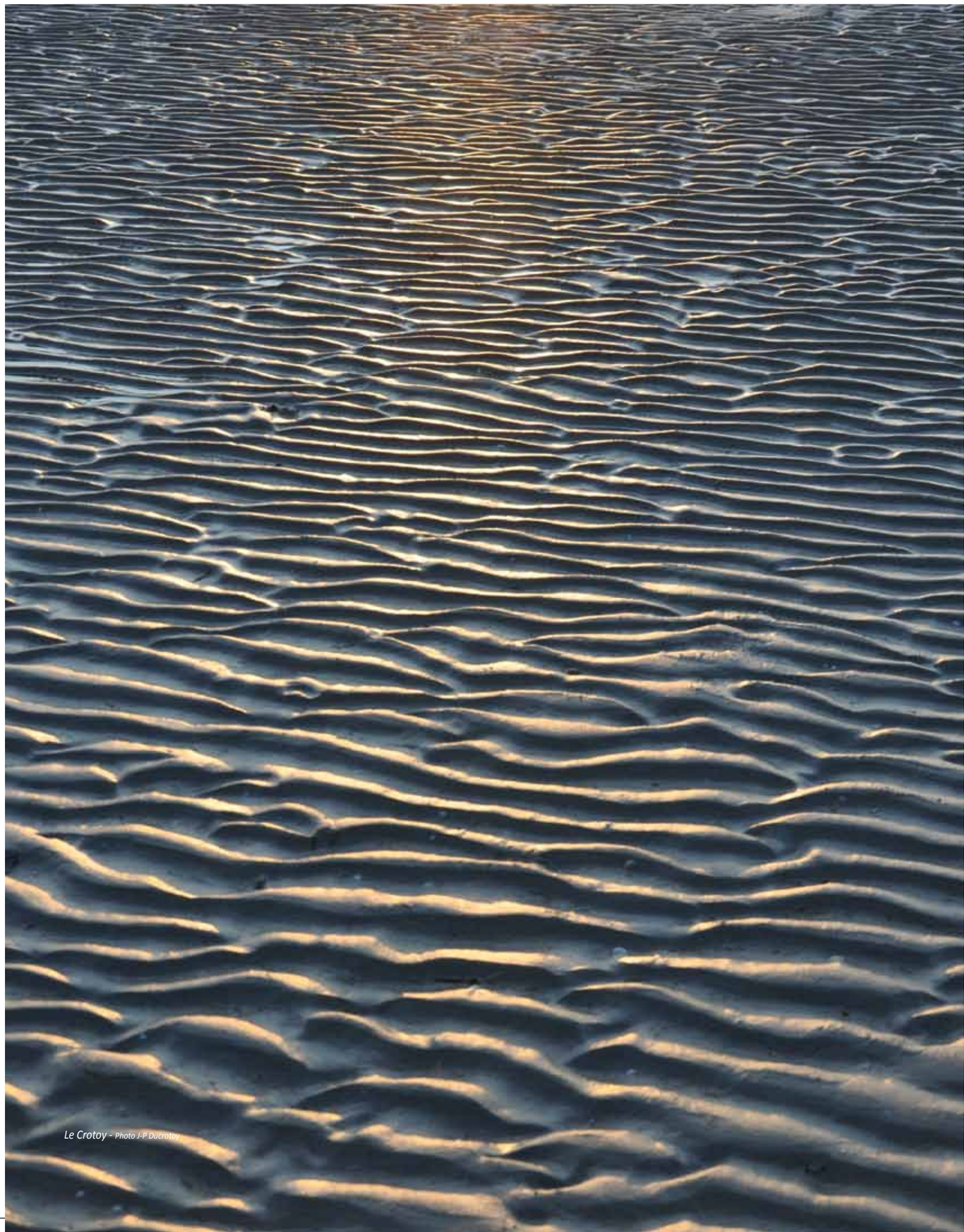
The conference will be designed according to:

- **Invited presentations proposed by the Scientific Committee;**
- **Oral presentations selected by the Scientific Committee on the basis of applications submitted in response to the call for communications and posters.**

The deadline for submission is **15 January 2015.**

Response to the call for papers will include:

- **A clear and informative title**
- **A choice between oral presentation and poster**
- **The chosen theme**
- **The names and affiliations of contributors identifying the names of speakers**
- **A summary of 400 words**



Le Crotoy - Photo J-P Ducrotoy

THE PANAMA CANAL

Geoff Millward

Marine Institute, Plymouth University,
Plymouth, United Kingdom PL4 8AA

ECSA members might like to know that this year marks the 100th anniversary of the inauguration of the Panama Canal on 08 August 1914. The Canal was the inspiration of the French architect and engineer Ferdinand de Lesseps. I had the pleasure of passing through the Canal on board the container ship "Matisse" courtesy of the French Line, Compagnie Générale Maritime (CMA-CGM). Stretching from the Caribbean Sea to the Pacific Ocean, the Canal is approximately 80 km long (Figure 1) and the transit time is of the order 15-20 hours, depending if sometime is required at anchor to allow ships from the south and north directions to pass each other. In any case, pre-authorised ships arriving at the Caribbean terminal, and requiring a daylight transit, must contact the Cristobal signal station in Limon Lake before 02:00 to be allowed to progress. Typically, the cost of a transit for a merchant vessel is in the range $100,000 to $300,000 US. While the price and the transit time might appear rather onerous they are both considerably less than a 27 day passage around Cape Horn!

FIGURE 1: The Panama Canal and Madden Lake Reservoir (Source BBC News).

The word "canal" may not accurately define the structure because the main part comprises the Gatun, a vast, artificial freshwater lake. The annual rainfall in Panama City is 1,906 mm so the Lake is continuously refreshed, particularly during the rainy season from May to December. The Gatun is about 30 m above sea level requiring locks to raise vessels from the sea to the Lake before transit and returning them to sea level afterwards. In order to pass through the three separate lock systems each ship requires an average of 200,000 m^3 of freshwater provided from Gatun Lake, and its supporting reservoirs, such as Madden Lake (Figure 1). Depending on its loading, the draft of a ship can increase up to 25 cm between Caribbean seawater (density~1023 kg m^{-3}) and tropical freshwater (density~995 kg m^{-3}) making vessel management in the relatively shallow Lake an important priority for the pilots. However, during rare occasions of drought, when the maximum allowable draft is reduced, some ships might be required to wait several days offshore until rainfall occurs and the water level in the Lake rises. Water management is made even more complex by the fact that in the Caribbean Sea the tides are microtidal, with a maximum range 0.3 m, whereas they are macrotidal on the Pacific side with a mean high water springs of 4.9 m. Also, variations of a few centimetres in seawater height are introduced by the differences in density between coastal waters of the Caribbean Sea, ~1023 kg m^{-3}, and the coastal Pacific Ocean, ~1019 kg m^{-3}.

Image 1

Currently, the Canal can accommodate a variety of ships, boats and, interestingly, nuclear submarines, provided they have a length <294 m, a beam <32 m and a draft <12m. These dimensions cater adequately for many of the present generation of merchant vessels, such as the "Matisse" which houses a maximum of 2,262 containers. Image 1 shows the two Gatun Locks, arranged side by side, at the Caribbean entrance to the Canal. The "Matisse" is in the right hand channel, while on the left is the cruise liner "Coral Princess", which has a very snug fit, leaving barely any "wriggle" room. In the locks, ships are not under their own power, rather they are moved by heavy-duty Mitsubishi electric locomotives, generally four forward and two aft (Image 1 shows the two aft locomotives moving the "Coral Princess" forward). The tightly-fitting cruise liner illustrates quite well the major problem currently faced by the Canal authorities. The locks are now too small to accommodate the new generation of ships, for example modern container vessels are much larger than the "Matisse" and can hold between 10,000 and 16,000 units. A public referendum was held in Panama during 2006 and 78% of Panamanians voted for the expansion of the Canal, hardy a surprising result given the massive revenue it generates. Now, new sections of

Image 2

Image 3

Canal near the Gatun, Pedro Miguel and Miraflores Locks are being constructed to accommodate vessels of length 366 m, with a beam of 49 m and a draft of 15 m. Image 2 shows four large doors to be fitted to the new locks at the Caribbean entrance to the Canal and in the distance the work on the new "cut" is evident (www.pancanal.com/eng/photo/camera-java.html).

On the transit south, after passing through the wide navigation channels of Gatun Lake, the route becomes more canalised (Figure 1). However, there is generally sufficient room for ships going south and north to pass each other comfortably. Finally, at the Miraflores Lock the freshwater meets Pacific sea water. Image 3 shows the "Matisse" being towed forward in the left hand lock at Miraflores, while the container ship "Ever Neptune" has passed through the right hand lock and into Pacific seawater. Here there is considerable development of the new canal. Image 4 shows a section of the new basin where construction work is continuing in the bottom of the basin and the far wall of the new canal is visible. The immediate hinterland has been cleared of lush tropical vegetation and terraced, thereby stabilising the landscape and minimising the amount of terrestrial debris likely washed into the basin from the land during the intense rainy season. The authorities are predicting that the new Canal should be functioning at the end of 2015 but it may be too little too late as the dimensions of some vessels currently under construction will exceed even the enlarged Panama Canal.

After 17 hours in transit through the Canal, and now free of the region of freshwater influence, the "Matisse" passes the bright lights of Panama City and steams into the open Pacific Ocean. Soon permission will be required from the Ecuadorian authorities to enter the pristine territorial waters of the Galapagos Islands on the way to Tahiti, Fiji, New Caledonia and beyond.

Image 4

The Hidden Threat of Historical Landfills on Eroding and Low-lying Coasts

Kate Spencer and Francis T. O'Shea
School of Geography, Queen Mary University of London

Historical Landfills

Historically we have always used our estuaries and coasts to dispose of waste. Estuarine waters offered efficient removal and dilution of our sewage and industrial effluents, whilst low-lying coastal land was often prone to tidal flooding with low economic and agricultural value providing suitable locations for waste disposal. Hence, there is a legacy of industrial contamination in our estuarine sediments and there are tens of thousands of historical landfills and other contaminated sites along our coastlines. The term 'historical landfill' is used to identify those sites that were developed prior to current waste management or pollution prevention legislation such as the EU Groundwater Directive or EU Landfill Directive. As a result, these sites are usually un-lined, with incomplete or non-existent records of the waste that was disposed within them and with no legal requirements for their management or monitoring. A recent report by CIRIA (Construction Industry Research and Information Association) (Cooper et al. 2012) suggests that there are at least 20000 of these sites in England and Wales alone, and this number is likely to be an under-estimate due to incomplete records and a large number of un-recorded illegal sites.

When these sites were developed, often in the early 20th Century, this seemed like a sensible option. For example, domestic waste could be easily and cheaply transported out of London on River Thames barges. It could then be disposed in pits left behind by the extraction of Thames Gravel, or on low-lying marshland, where fine-grained sediments with poor hydraulic conductivity would provide natural attenuation of any leachate, protecting the adjacent Thames Estuary. However, all this happened in an era not only when we had far less understanding of the impacts of pollution on our aquatic environment and little pollution prevention legislation, but also before we had the vaguest inkling that anthropogenic climate change may have real and significant impacts on our coastlines.

Threats to the coastal zone

Climate change is likely to have wide-ranging impacts on our coasts and projections state that precipitation, surface runoff, sea level, sea temperature, salinity, storm frequency and storm magnitude are to increase within the next 50 years (Soloman et al. 2007). The most significant consequences for historical coastal landfills are likely to come from tidal flooding and/or erosion. Of the 20000 historical landfill sites recorded in England and Wales, 25% are within the Environment Agency's flood alert area, being at risk of a 1 in 100 year return period flood event (Environment Agency, 2012). For example, in south east England on the lower Thames Estuary there are > 50 landfills that are considered at risk of flooding and/or erosion (Figure 1) (Environment Agency, 2012). In many instances, rainwater and surface run-off will have already percolated through these waste materials for many decades, however inundating the sites with saline waters may have additional and un-quantified impacts on contaminant release. Of

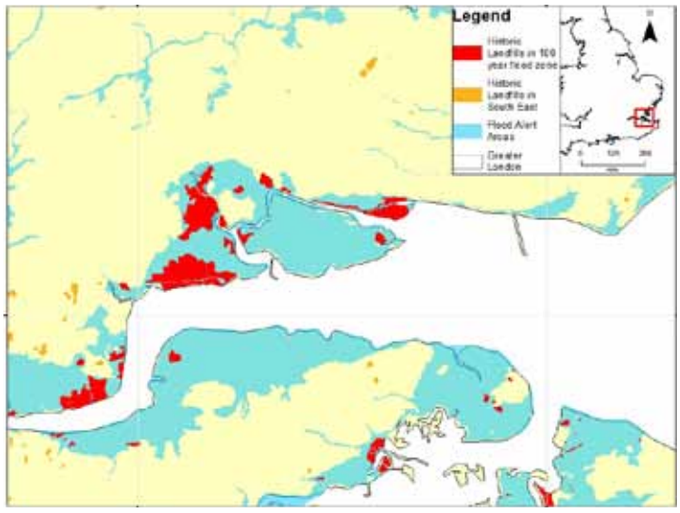


Figure 1: Vulnerable coastal landfills within the Environment Agency flood alert area in the Thames Estuary.

perhaps more significant consequence is the impact of erosion. Many of these sites are on vulnerable coastlines which are already actively eroding and there have been some well-publicised examples of waste material being released to the coastal environment during landslips and coastal erosion (BBC 2012). This presents a very clear visual pollutant and may also have impacts for local water quality, sediment quality and the invertebrate community that inhabits these environments. In addition, this is a long-term, un-quantified, diffuse input of contaminants to the coastal zone. Figure 2 provides an example of material collected from the foreshore at the eroding margin of an estuarine landfill in SE England operational from c. 1930s to 1950s, as well as material excavated from a seawall constructed from waste in the 1980s. The objects can be clearly dated to the 1940s and include glass and ceramics, food cans and ash from domestic coal fires. There is also the potential for the large-scale physical redistribution of waste from these sites as the result of a major storm surge or failure of an existing defence, this is of particular concern where waste materials have been used to backfill or infill sea defences.

There is also the real possibility that sediments surrounding these sites have been contaminated by landfill leachate. Figure 3 shows a conceptual model of the potential pathways by which contaminants can be

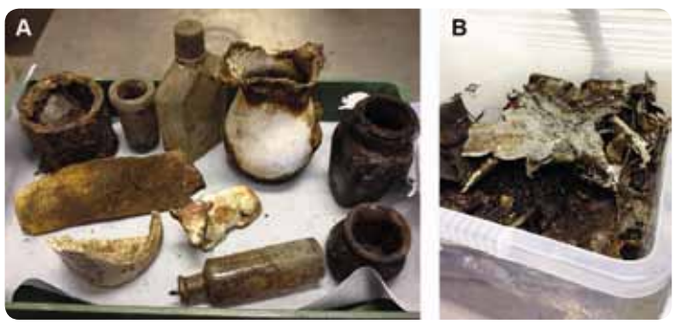


Figure 2: a) Material collected from the estuary foreshore from the eroding edge of a 1940s landfill, the material is predominantly glass or ceramic food and cosmetic containers including medicine bottles, haircare products, animal bones and a solitary tin can; and - b) Material excavated from a waste-filled coastal defence that was constructed in the 1980s and includes large amounts of paper and plastic waste.

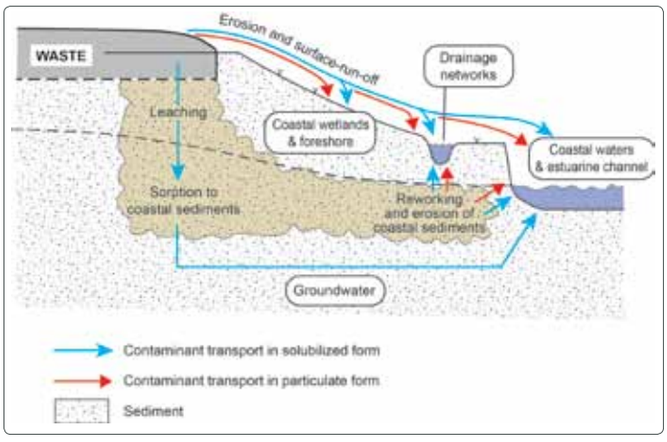


Figure 3: A conceptual model for sources, pathways and fate of contaminants in vulnerable coastal landfills.

transported from the waste body to the surrounding environment. Many of these sites were engineered without basal or side wall liners, and they relied on the natural attenuation capacity of surrounding fine-grained sediments to sorb contaminants before the leachates interacted with saline groundwater or surface waters. Therefore, surrounding sediments may be contaminated and the spatial extent of this contamination will depend on the flux and chemical behaviour of the contaminants released, physico-chemical characteristics of the sediment and local hydrological conditions. Whilst efforts might be made to defend the waste body itself from erosion using hard engineering, re-working of these surrounding sediments could contribute a secondary and diffuse source of contamination to estuarine and coastal waters.

What to do next?

The historic landfill sites situated on actively eroding and low-lying coasts clearly present a significant risk and the potential for diffuse discharge of pollutants to estuarine and coastal waters has not been quantified and is poorly understood. Those currently responsible for managing these sites have a duty of care towards the adjacent aquatic environment. Yet, currently there are few tools for assessing the risks associated with climate change and the erosion/inundation of these sites. Research is needed to understand; 1) the extent and magnitude of diffuse pollution from landfills; 2) the likelihood for failure and/or erosion of contaminated foreshore sediments and 3) the impacts on water quality and ecosystem health.

CIRIA's current guidelines (Cooper, 2012) adopt a 'source-pathway-receptor' approach and recommend removing the pathways identified within the site's conceptual model, effectively intercepting the contamination and preventing it from reaching vulnerable, sensitive receptors. This can include regular cleaning up of material visible at the surface and constructing cut-off walls and coastal defences providing a physical barrier between waste and the surrounding environment. These options are all site and cost dependant.

For more information on our current projects working with the Environment Agency, Essex County Council and Arcadis to assess diffuse pollution from coastal landfill sites see http://www.geog.qmul.ac.uk/staff/spencerk.html.
For further information email: k.spencer@qmul.ac.uk

References

BBC 2012. Northam Burrows coastal erosion exposes 1940s rubbish. http://www.bbc.co.uk/news/uk-england-devon-20066264. Accessed February 27 2014.

Cooper, N., Bower, G., Tyson, R., Flikweert, J., Rayner, S., Hallas, A., 2012. *Guidance on the Management of Landfill Sites and Land Contamination on Eroding or Low-Lying Coastlines* (C718). London, CIRIA. .

Environment Agency 2012. Whats in your Backyard? [Online] URL available at: http://www.environment-agency.gov.uk/homeandleisure/37793.aspx. Accessed 20th October 2013.

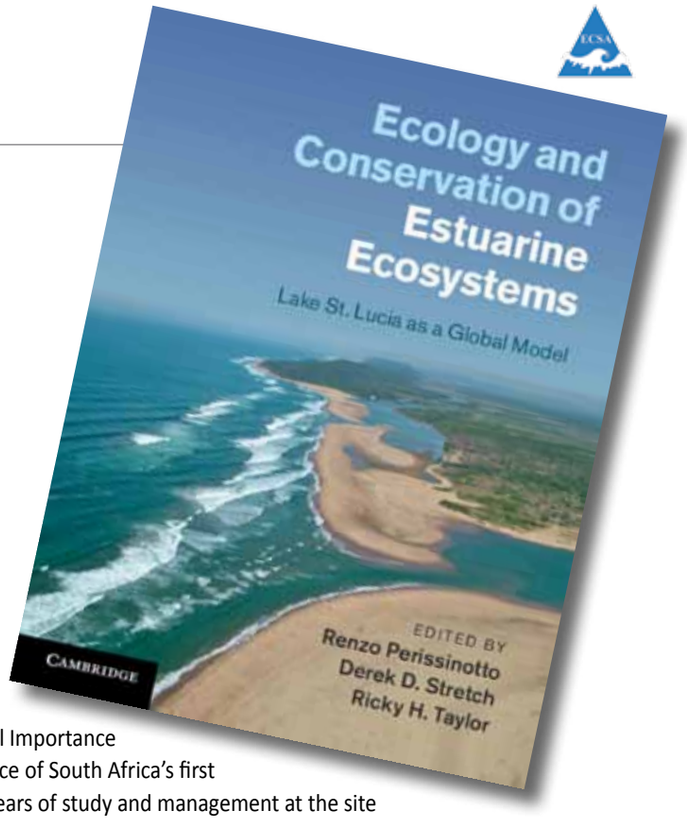
Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, & M. Tignor, H. L. M. (eds.) 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press.

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.
ECSA e-news is fostered by the contribution of all members and can be also a good way to spread ideas to the ECSA community. Members are warmly invited to submit news by sending an email to the e-news editor, Anita Franco, **a.franco@hull.ac.uk.** The subject of the e-mail will be used as title of the announcement in the e-news, hence members are invited to keep it short and explicative. No attachments are allowed.
ECSA e-news is e-mailed to members three times yearly. If you are an ECSA member and you never received the e-news, you should make sure that we have your correct e-mail address by contacting our Membership Treasurer, Clare Scanlan, **clare.scanlan@sepa.org.uk.**

Book Review

Ecology and Conservation of EstuarineEcosystems: Lake St Lucia as a Global Model



Edited by Renzo Perissinotto, Derek D. Stretch & Ricky H. Taylor

Cambridge University Press
ISBBN: 978-1-107-01975-1
486 pp.
£75, $120, 95€
45 contributors
21 chapters

St Lucia is known for being the world's oldest protected estuary (in 1895) and was the first in the world to be declared a Ramsar Wetland of international Importance in 1986. It is also Africa's largest estuarine system. It has become the centrepiece of South Africa's first UNESCO World Heritage Site, the Simangaliso Wetland Park, built on over 60 years of study and management at the site supported by more than 200 peer-reviewed scientific articles and reports to date. So, it is not surprising that the estuary has benefited from an integrated approach, combining knowledge of ecosystem structure and functioning with management problems. Indeed the book edited by Renzo Perissinotto, Derek D. Stretch & Ricky H. Taylor covers biodiversity, geological origins, hydrology, and hydrodynamics. Past management of Lake Saint Lucia is unique in the world and the preface by Prof Alan Whitfield emphasises that it is to be considered as a "jewel in the estuarine crown". Such a jewel, for sure, deserved a special book. The 486 pages are nicely laid out and look very attractive. Chapter contents are shown on a full page with a photograph illustrating the main topic of the chapter. It is of note that half of the iconography is in colour. Together with the clearly displayed text, the book is very nice reading while (and this is disappointing), some figures have small captions which are difficult to read. References are all assembled at the end of the book making it difficult to consult one chapter independently from the others.

The structure of the volume reflects the long history of progress towards an opening to contemporary sciences including climate change studies:

1. **South Africa's first World Heritage - Site Roger N. Porter**
2. **Management history - Ricky H. Taylor**
3. **Geological history - Greg A. Botha, Sylvi Haldorsen and Naomi Porat**
4. **The marine environment - Allan D. Connell and Sean N. Porter**
5. **Catchment hydrology - Derek D. Stretch and Andrew Z. Maro**
6. **The Wetlands - William N. Ellery, Suzanne E. Grenfell, Michael C. Grenfell, Marc S. Humphries and Kirsten B. Barnes**
7. **Estuary and lake hydrodynamics - Derek D. Stretch, Clint P. Chrystal, Robynne A. Chrystal, Christopher Maine and Justin J. Pringle**
8. **Groundwater hydrology Bruce E. Kelbe, Ricky H. Taylor and Sylvi Haldorsen**
9. **Physico-chemical environment Renzo Perissinotto, Nicola K. Carrasco and Ricky H. Taylor**
10. **Microalgae Renzo Perissinotto, Guy C. Bate and David G. Muir**
11. **Macrophytes Janine B. Adams, Sibulele Nondoda and Ricky H. Taylor**
12. **Benthic invertebrates Deena Pillay, Sarah J. Bownes and Holly A. Nel**
13. **Zooplankton Nicola K. Carrasco, Renzo Perissinotto and Hendrik L. Jerling**
14. **Penaeid prawns Anthony T. Forbes and Nicolette T. Forbes**
15. **Fish and fisheries Digby Cyrus**
16. **Birds Jane Turpie, Ricky H. Taylor, Meyrick Bowker and Caroline Fox**
17. **Crocodiles Xander Combrink, Jonathan Warner and Colleen T. Downs**
18. **Hippopotamuses - Ricky H. Taylor**
19. **Alien and invasive species - Nelson A. F. Miranda and Janine B. Adams**
20. **Food webs and ecosystem functioning - Ursula M. Scharler and Fiona C. MacKay**
21. **Climate change impacts - Andrew A. Mather, Derek D. Stretch and Andrew Z. Maro**

For a long time, I have dreamt of long-term data sets which would allow to detect trends in the ecology of estuaries. In Chapter 20, Scharler and MacKay have been able to compare food webs in Lake St Lucia in 1948-1951 and after 2002. Climate' change comes out strongly as a factor producing changes in the evolution of the estuary. They show that that during closed phases of the estuary, biomass was lower in the lake and higher in the narrows. Given that the inlet was closed for ten years, prawns were unable to recruit to Lake St Lucia. They are not considered to be part of the food web anymore. Extreme states and suppression of prawns have been followed by the disappearance of their predators: humans, crocodiles, fish. But invasions have taken place, for instance by the Asian gastropod *Tarebia granifera*, affecting the overall functioning of the ecosystem.

Despite the historical background of the ecosystem, the impact of global change, not surprisingly, stands out as the biggest challenge for future conservation and management of the St Lucia system. Recently a project in support of its rehabilitation and long-term sustainability has been initiated. Adapting to climate change, obviously, is the key to any future action. Regrettably, the focus of the book is limited to sea level rise and fresh water flow into the estuary, although some other aspects are quickly sketched out.

Overall, the book stands out as rich information is presented to cover all aspects of ecology. It will serve as a valuable model for other estuaries around the world. However, there is no overall conclusion and the book lacks a closing chapter. It would have been nice to have a final paper opening onto global perspectives and socio-economics.

Jean-Paul Ducrotoy
Institute of Estuarine and Coastal Studies

ECSA Bulletin

The ECSA Bulletin is produced twice a year. Material for the Bulletin must be submitted to the Editors by December 1 or June 1, for issues appearing in January and July respectively. We would be pleased to receive short articles and notices of publications and meetings. Information on change of address, and applications for membership should be sent to the Membership Treasurer and not the Editors, correspondents or publishers.

Bulletin Editor
Jean-Paul Ducrotoy
Institute of Estuarine & Coastal Studies
University of Hull, Hull, HU6 7RX (UK)
Tel: +33 0322 238 074
Mobile: +33 0633 874 524
e-mail: jean-paul.ducrotoy@hull.ac.uk

Membership Treasurer
Dr Clare Scanlan
Senior Marine Ecologist
SEPA
Inverdee House, Baxter Street
Torry, Aberdeen AB11 9QA (UK)
e-mail: clare.scanlan@sepa.org.uk

ECSA Web Master
Karen L. Nicholson
Institute of Estuarine & Coastal Studies
University of Hull, Hull, HU6 7RX (UK)
e-mail: k.l.nicholson@hull.ac.uk
Tel: (+44) 1482 463167

e-newsletter Editor
Dr Anita Franco
Institute of Estuarine & Coastal Studies
University of Hull, Hull, HU6 7RX (UK)
e-mail: a.franco@hull.ac.uk

Workshop Organiser
Teresa F. Fernandes
Napier University, Edinburgh EH10 5DT (UK)
e-mail: tfernandes@napier.ac.uk

Association's *Editor of Estuarine, Coastal & Shelf Science*
Mike Elliott
Institute of Estuarine & Coastal Studies
University of Hull, Hull, HU6 7RX (UK)
e-mail: mike.elliott@hull.ac.uk

Designed, printed and distributed by:
Blackfriars Contract Division,
Manor House, 1 - 5 Manor Street,
Stonehouse, Plymouth PL1 1TL
Tel: 01752 220451 • www.netprinter.co.uk

Coasts and Estuaries of North and mid-Wales

Booking Form: **Bangor University, Wales, UK, 8-10 April 2014**

Please use a separate form for each delegate

Name: .....

Organisation: .....

E-Mail: .....

Address: .....

.....

.....

Are you an ECSA member Yes/No

Are you a registered student? Yes/No

Please give details of special dietary or other requirements:

.....

.....

Conference fee @ £45 / £50 / £60 / £65

Optional field trip on 8 April @ £11 Yes/No

Optional conference dinner on 9th April @ £25 Yes/No

Are you interested in attending the workshop on 10th April (free)? Yes/No

Total: **£**

Please return with payment to:
awith@noc.ac.uk
or by post to: ***Andrew Wither, National Oceanography Centre, 6 Brownlow St., Liverpool L3 5DA. UK.***

Council of the Estuarine & Coastal Sciences Association

Registered Charity 264006

Officers

President
Professor Geoff Millward
Marine Institute
University of Plymouth
Plymouth PL4 8AA, UK
e-mail: G.Millward@plymouth.ac.uk"

President-elect
Dr Kate Spencer
School of Geography, Queen Mary University
London E1 4NS, UK
e-mail: k.spencer@qmul.ac.uk

Honorary Secretary
Dr Mark Fitzsimons
Biogeochemistry Research Centre SoGEES
University of Plymouth
Plymouth, Devon, PL4 8AA
e-mail: mfitzsimons@plymouth.ac.uk

Honorary Treasurer
Professor Martin Wilkinson
School of Life Sciences, Heriot-Watt University
Riccarton, Edinburgh EH14 4AS Scotland
m.wilkinson@hw.ac.uk

Membership Secretary (Co-opted)*
Dr Clare Scanlan
SEPA
Inverdee House, Aberdeen AB11 9QA, UK
e-mail: clare.scanlan@sepa.org.uk

Conference Coordinator
Professor Victor de Jonge
Institute of Estuarine & Coastal Studies
University of Hull, Hull, HU6 7RX UK
v.n.de.jonge@planet.nl

Publications Secretary
Dr Steve Mitchell

Bulletin Editor
Dr Jean-Paul Ducrotoy

Workshop Coordinator
Professor Teresa Fernandes

UK Local Meetings Organiser
Andrew Wither

ECSS Editor (Co-opted)
Professor Mike Elliott

e-newsletter
Dr Anita Franco

Early Career Liaison Officer
Sally Little

WebMaster
Karen Nicholson

Honorary Auditor
Dr Alistair Lyndon

Trustees
Dr Donald McLusky
Dr Nev Jones
Professor Reg Uncles

Elected members
Dr Sergia-Costa-Dias
Professor Axel Miller
Dr Ruth Callaway
Professor Patrick Meire
Dr Mike Best
Mr Ross Brown
Dr Richard Whitehouse

Sponsors
Astra Zeneca
Environment Agency
HR Wallingford Ltd
Scottish Association for Marine Science
Scottish Environment Protection Agency

**To whom changes of address should be sent Scottish Environment Protection Agency*

Estuarine and Coastal Sciences Association (ECSA)

The Estuarine and Coastal Sciences Association (ECSA) is a direct continuation of the Estuarine and Brackish Water Sciences Association (EBSA). The association was founded in 1971, and is the major European focus for the communication of research and scholarship in estuarine science. Membership is open to all who are interested in estuarine and coastal marine science, whether in Europe or further afield. The association holds local meetings, where work relevant to one specific estuary or coastal site is presented, and international symposia, where work applicable to a chosen theme of estuarine and coastal science is presented. Many of the symposia have been published. The association has caused to be published Handbooks of Methodology for estuarine studies, and Synopses of the British and European fauna, which are available to members at reduced rates. The association has an associated journal, *Estuarine and Coastal Shelf Science*, which is available at greatly reduced rates to members.
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:

ECSA Membership Treasurer,
Dr Clare Scanlan,
Scottish Environment Protection Agency (SEPA),
Inverdee House,
Aberdeen AB11 9QA, Scotland, UK

or from the ECSA website:

www.ecsa-news.org/joiningECSA.htm