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Thames Estuary - Photo Port of London Authority

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With thanks to all contributors.

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.

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Editorial ECSA 64

Science and Law

Post-modernism – the modernist crisis – is marked by the prodigality of the contemporary legal discourse and the production of numerous pieces of law to protect and manage the marine environment. Why is Law everywhere? In our daily work as marine scientists we can see that the debate is hot. The ancestral patrimonial way of conceiving power does not apply anymore but democracy, which has replaced it, shows certain signs of slowing down. Is it threatened because of an always-increasing interdependence of national economies based on an unprecedented increase in communication and in commercial exchanges? Is finance driving society as could show the recent Greek example? Is the complexity of human relationships, split between science, political power and law, manageable world wide?

Hyper-globalisation appears to be imminent but, to the ecologist, the notion of a 'global' environment is hollow, vague, and full of tensions. It does not fit with an ecosystemic approach, which is used by scientists to enrich and further a limited and simplistic pollution approach. In order to promote a new vision and a better understanding of what we call "Nature", we need to facilitate interactions between governmental agencies and the public (notably non-governmental organisations) and, at the same time, translate scientific studies into policies – and politics... So, a new vision is required, not just more regulations The role academic institutions, universities especially, will be crucial. ECSA has an important role to play in meeting the need to rethink and redefine national and international governance. *Polis*, *Logos* and *Physis* have to be reconsidered together in order to redefine sovereignty, rethink the international order, based on a remodelled notion of citizenship.

On the one hand, despite a lot of publicity about scientific research in the media, achievements in the pure sciences, according to some philosophers, have been limited. Physics, for example, is in disarray. Reconciling quantum physics with macro physics has not been achieved, regardless of huge sums of money spent on cyclotrons and other particle accelerators. In the biological sciences, despite increased knowledge in genetics (the genome in particular), cancer is not yet fully understood.

On the other hand, technology has benefited from huge developments. Information technology is just everywhere and medical research is focused on the production of cures, not the understanding of illness and patients. Because of the domination of technology, the word "technoculture" has been used by Baudrillard to name our 21st Century culture. But the 'ever new' proposed by the technological society prevents it from changing. It stays the same. Technology means profound immobility. It is just the routine production of marketable goods for a society of consumers but only for the sake of the system's survival.

Does technology leads to a dead-end then? Or is it its domination? How to escape such a domination of technology? Through philosophical scrutiny: the same as the rational metaphysical thought from which it derives. According to Heidegger, the essence of technology is not something technological. We must refute the tyranny of technology, its inescapable and unique reality, its cogency and necessity. As scientists, we must take part in the debate.

Technology, and the industrial structures, which go with it, make the natural habitat look like a problem. Baudrillard says that we live in a world of simulations. History has become some sort of waste to be recycled: it is a 'residue'. Baudrillard's concept of 'residue' extends to the natural world. Nature has become an encumbrance, which we cannot dispose of. Effectively, nature becomes a waste when it becomes recognised by law as having 'rights'. These rights are conferred by the law to give nature official recognition once it has disappeared.

Science is not the only element of the solution to the better management of marine ecosystems. Factual knowledge is not limited to science. History, languages, mathematics, law, ethics, logic are not part of science and do not have to be, but have their obvious role to play. Science is a fraction of the process of intellectualisation, maybe the most important fraction. For many years now, ECSA has promulgated interdisciplinarity, but progress has een slow.

Already, at the beginning of the Century, Max Weber viewed modernity as progress bought at a high price. It bought individual liberty, rational thought, and progress in material well-being, but, in exchange, for a 'disenchantment of the world', and 'an iron cage' of bureaucratic alienation. Is a scientific line of attack a way worth exploring and developing? As scientists, let's be open to globalisation but allow time for restricting it when necessary. Society should be open to change and accept being reorganised in view of the accepted changes. Finally, reaffirming one's difference might be of vital importance, even if it might seem negative. Overall, the reply lies in a vision leading to better regulations not to even more regulations. Only education can provide such a vision.

J-P Ducrotoy
Reader Emeritus IECS, the University of Hull

View from the chair

It seems like only yesterday that I assumed the Presidency of the Estuarine and Coastal Sciences Association, in May 2012, at the local meeting "Scottish Lochs and Adjacent Waters" organised by Professor Axel Miller at the Scottish Marine Institute in Oban. However, three years have rushed by and I will be stepping down after completing my term at our "local" meeting to be held in Le Havre, France, on 27-28 May. Then Dr Kate Spencer, President-Elect from Queen Mary University of London, will take the helm, most notably as the first female president since the Association's formation more than 40 years ago. The successes enjoyed by the Association, over many years, could not have been achieved without the support of the ECSA Council, all of whom give freely of their time. Each of the current Councillors is committed to carrying out her or his individual task geared to securing the long-term future of the Association. I have been very fortunate, as President, to be working with such an enthusiastic group of colleagues and I really appreciate their individual contributions to the continued success of ECSA. Thank you all. I am sure that this commitment, crucial to the sustainability of the Association, will continue under Kate's guidance. I encourage all ECSA members to give her their full support.

ECSA is one of the pre-eminent professional marine scientific organisations in Europe as it commands a committed international membership and holds its conferences across the world. It has been a great pleasure to be part of our international engagement at various European venues, in Venice, Shanghai and in soon in September 2015 in London. Our major conferences are held in partnership Elsevier and the Association is extremely grateful for their on-going support. In the near-term ECSA will hold its local meeting abroad for the first time. We are fortunate to have the commitment of our colleagues at the Grand Port Maritime Du Havre who are sponsoring the conference devoted to estuarine recovery, focussing on the Seine Estuary. I hope that members will respond positively to this initiative and register for the conference and attend the ECSA AGM. Full details of which can be found on the ECSA website (www.ecsa.org). With the expertise of ECSA's Conference Organiser, Dr Sally Little, Council will continue to augment its first-class portfolio of national and international conferences. This will ensure the Association delivers as big a boost as possible for fundamental estuarine research and will enhance ESCA's role as an important hub for the publication of scientific excellence. These ventures also give us great opportunities to promote the careers of post-graduate researchers and early-career academic staff.

However, I take this opportunity to mention the biggest disappointment during my tenure which was the difficulty encountered in putting on an international conference in Thailand in 2014 due to the political situation in that country. I hope that it will still remain an aspiration for the Association in the future because big changes are taking place throughout the ten ASEAN countries (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam) which have globally important estuaries and coastal seas. I am optimistic ways could be found for the Association to expand into south east Asia where the aquatic environment, and scientific infrastructure, offer significant opportunities to compare and contrast tropical and temperate estuaries. The need for estuarine research in these countries is exemplified by the major flooding that occurred in Malaysia in late 2014. **River Flooding in Malaysia 2014**

The wet season in Malaysia is governed by the North East Monsoon from November to March but in December 2014, and January 2015, the rainfall was 60% above average and on one occasion 255 mm (about 10 inches) fell in 24 hours. This resulted in flooding across wide areas of the country with more than 200,000 people displaced, 21 of whom were killed and loses of property amounting to $560M. The Malaysian Taman Negara (National Park) is located in the centre of the country, it hosts one of the world's finest rain forests and was seriously affected by the recent downpours.

View from the chair *continued*

On 23 December the Sungai (River) Tahan over-topped the river banks and exceeded the water level of 74 m above normal previously reported in 1971 (Image 1) in the Taman Negara. The intense river flow removed a significant amount of the river bank and most of the vegetation for many kilometres downstream. The National Park hosts the Mutiara Taman Negara Resort. Several of the Resort's cabins and function rooms were destroyed or seriously damaged. Unfortunately, the Resort was hosting dozens of foreign tourists who had to be airlifted to safety by helicopter.

Image 1: The Sungai Tahan with a view of the Taman Negara and in the foreground the floating restaurants anchored to the opposite bank.

On the opposite bank is the village of Kuala Tahan (Image 2) which was seriously flooded with many businesses, including floating restaurants, along the river bank completely destroyed. Even those on high ground were affected, including the

school. Electricity supplies were interrupted and food shortages soon set in.

Image 2: The Sungai Tahan flooding the village of Kuala Tahan (~~80 m above the normal level) on the bank opposite to the Taman Negara. The two white buildings in the centre are the local school which was inundated at the ground level.

Previous major flood events in the Sungai Tahan occurred in 1971 and before that in 1926, suggesting a return period of about 45 years. The point of mentioning this crucial matter is that, across the world, there appears to be insufficient research into aperiodic events of this magnitude, which still appear to be largely unpredictable. Clearly, development of an Early Warning System is vital to the people that live in remote communities, together with management strategies for evasive action. We can but hope that governments and scientists, alike, will take note of the need for coherent international research programmes into these events and their aftermaths.

Best wishes for your future

Geoff Millward

Emeritus Professor of Marine Chemistry, Plymouth University

Introducing the New President and New Secretary

Dr Kate Spencer

Kate trained as an Earth Scientist and then specialised in the aquatic environment taking first a MSc in Water Management and then her PhD in Environmental Geochemistry which she completed in 2000. In the early years of her career she spent time teaching across the earth and environmental sciences in both further and higher education. She joined Queen Mary University of London in 2003 where she is now a Reader in Environmental Geochemistry.

Kate works closely with oceanographers, geomorphologists, hydrologists and ecologists to provide the fundamental science to underpin effective management of fine and cohesive sediment. This work has focussed on understanding the source, distribution and behaviour of sediment-bound contaminants coupled with fine sediment dynamics and sediment structure. Kate is particularly interested in understanding the links between physical processes and biogeochemical cycling. A key goal is to understand how natural disturbance (e.g. climate change and erosion events), anthropogenic management (e.g. drainage and dredging) and restoration activities (e.g. managed realignment) impact contaminant behaviour in sediments.

Most of her work focuses on the estuarine environment, but projects have included lowland and upland river catchments, urban lowland rivers and engineered systems. She principally works in the UK, where low-lying coasts, a long history of industrial inputs to rivers and estuaries, and the threat of sea level rise provide plenty of opportunities for research. However, she has also worked in the USA, Canada, France and China. As well as leading a number of projects in the UK, Kate has also collaborated on large international consortia e.g. EU Interreg.

Kate has been a member of ECSA (on and off!) since 2004 and joined the council in 2010, before being elected as president-elect in 2012. She's spent time on our conference committee and has had a role to strengthen links with external organisations. As such, she also represents us as a co-opted member on the SedNet steering group. Kate also works with a lot of colleagues outside academia and has provided advice on sediment/ contamination issues to environmental consultancies, estuarine conservancy organisations, environmental campaign groups, environmental agencies and ports authorities.

Dr Gillian Glegg

Dr Gillian Glegg is currently an Associate Professor at Plymouth University where she leads the Centre for Marine and Coastal Policy Research (MarCoPol) and teaches on the BSc in Ocean Science and Marine Conservation and MScs in Applied Marine Science and Planning. Her first degree, from Edinburgh University, was in Environmental Chemistry and following this she went to Plymouth Polytechnic (as the University was then called) to undertake a PhD on the behaviour of trace metals in estuaries. Following this she went to work in the NGO sector, acting as a scientific advisor providing advice on water quality, industrial discharges, urban wastewater treatment, and marine and coastal management.
On returning to Plymouth her research focus had moved from the environmental analytical work to the links between science and policy in the management of human activities and their impacts on marine and coastal water quality and management. Her publications include specific studies on individual pollutant sources, development of tools for improved marine management and wider policy questions. Working with an interdisciplinary team in MarCoPol she has participated in a number of large EU funded research projects including recently VALMER and PEGASEAS, two INTERREG funded projects exploring improved management and planning of the English Channel/La Manche. More information about the research and associated courses in Plymouth (including a short course for continuing professional development on marine spatial planning) can be found in the following web address www.plymouth.ac.uk/research/marcopol.

Obituary

Mr RS Glover, FIBiol, FRSE, MemMBA

9th June 1922 – 22 November 2014

Ro Glover, who has died at the age of 92, made a major contribution to the development of marine science, especially in Plymouth. He was the first director of the NERC Institute for Marine Environmental Research (IMER), a post that he held for 13 years, until his retirement in 1983.

Ro Glover's career began in 1944 when he moved to University College Hull to join Alister Hardy, the inventor of the Continuous Plankton Recorder survey (now run in Plymouth by the Sir Alister Hardy Foundation for Ocean Science, SAHFOS). In 1950, the survey moved to Edinburgh to form the Oceanographic Laboratory of the Scottish Marine Biological Association, and Ro Glover led the group for 13 years until 1970. Under his leadership, the CPR survey extended sampling from the initial North Sea routes to include the North Atlantic. In 1970, NERC established a new institute in Plymouth (IMER), which incorporated the Edinburgh Oceanographic Laboratory with Ro Glover as Director. The remit of the new institute was to expand studies of variability to near-shore and estuarine environments by the integration of physical, chemical, biological and experimental studies.

IMER began life in a converted hotel in Plymouth. The staff complement grew rapidly, numbers doubling with the recruitment of new staff and transfer of other NERC units. It is striking how many of the young scientists recruited by Ro Glover went on to develop international reputations as marine scientists. He obtained the funding from NERC for a new building, which opened in 1977. Staff from Edinburgh, and from numerous temporary premises in Plymouth, were then able to come together for the first time in the same building. At that time, research at IMER was well funded and there was generous provision of capital equipment. Ro Glover was very successful in shielding his scientists from bureaucracy and the problems of fund-raising – to an extent that would be difficult to believe for later generations of scientists. Ro Glover retired as IMER Director in 1983, leaving a very vibrant research organisation. In 1988, following a House of Lords Select Committee report, IMER was merged with the scientific programmes of the MBA to form the Plymouth Marine Laboratory, with Brian Bayne as Director.

Ro Glover was a past President of ECSA; he served as a member of MBA Council, as well as the Councils of SMBA and the British Ecological Society, and contributed to the work of NERC, ICES and many other organisations. His legacy lives on strongly, with Plymouth acknowledged as an international centre of excellence for marine research through the work of the MBA, PML, SAHFOS and the University of Plymouth.

Ian Joint

Student Report

ECSA Travel Grant

DMSP and Related Compounds Symposium, Barcelona
26th-30th May 2014

Charlotte Cree

The DMSP and related compounds symposium (http://www.dmspsymposium.com/), held in Barcelona at the end of May, was an exciting opportunity to meet other scientists in my field, including both senior scientists and early career researchers like myself. Designed to be a multidisciplinary meeting there were a variety of scientists present from molecular biologists to analytical chemists and atmospheric modellers. It was a long week with full days of high quality talks followed by poster sessions and lively discussion sessions about the future of work in this field.

The symposium was an ideal venue to present the analytical developments that I have made during my PhD which have allowed us to analyse methylated amines in coastal seawaters. My work has focused on the quaternary amine glycine betaine and its degradation products the methylamines that are thought to be climatically active (Figure 1). I presented a talk on my work on the concentrations of the quaternary amine glycine betaine in English coastal waters alongside a poster on my newly developed solid phase microextraction method for analysing the methylamines in seawater. I received overwhelmingly positive feedback on the quality of my talk and a lot of interest in both my talk and poster topics as important and interesting areas for future work. As a result of my attendance at this symposium I have been invited to participate in the Plankton-derived Emissions of trace Gases and Aerosols in the Southern Ocean (PEGASO) cruise working in collaboration with the Institute of Marine Sciences in Barcelona. This is a very exciting chance to visit Antarctica and apply my newly developed methods to Antarctic marine science

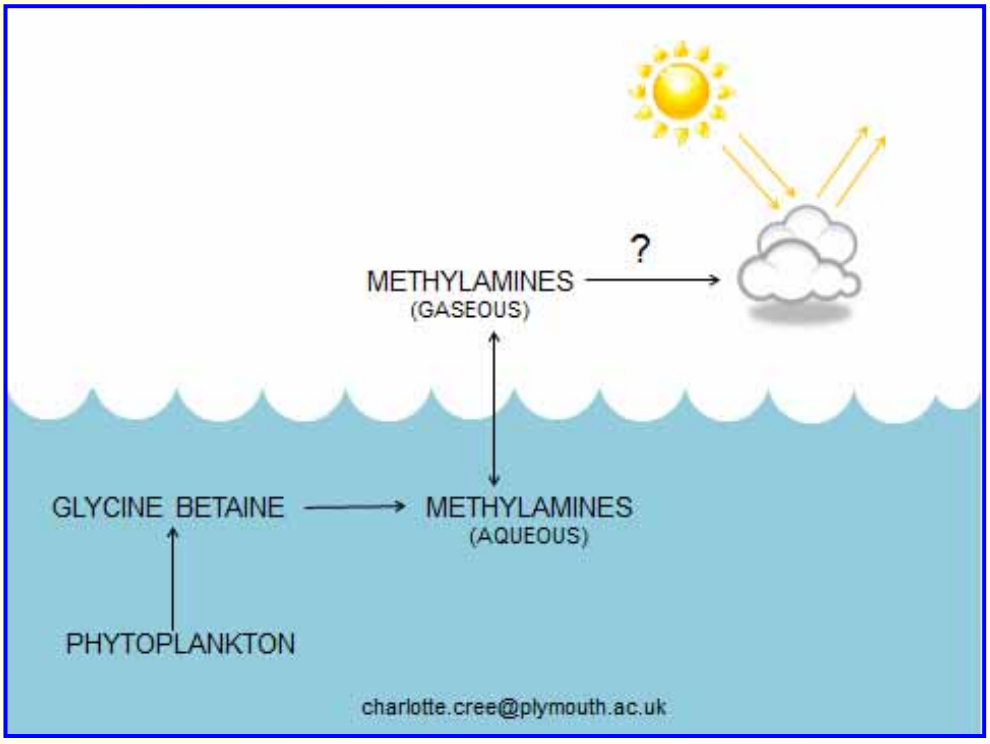

Figure 1: The cycling of methylated amines in marine systems

Report from the Annual General Assembly

Report on ECSA Council 45th Annual General Meeting

The Council met during the Port 2000 symposium in Le Havre a local ECSA meeting on the Seine Estuary in the Le Havre World Trade Center. The council expressed it s gratitude to Pascal Galichon from the Grand Port of Le Havre for his efforts and that of colleagues for a great conference. The Annual General Meeting was well attended (11 members of council and one ECSA member) and chaired by Professor Geoff Millward, the outgoing President of ECSA.
Following three years in the post Professor Millward had reached the end of his tenure as President

and sincere thanks were expressed to him for his hard work especially on promoting research student and early career academics during his tenure. The association intends to maintain its commitment to enhancing recruitment and diversity of its membership.

Dr Kate Spencer, the erstwhile President Elect, was then elected to the role of president and following the call for nominations earlier in the year Professor Axel Miller, from the Scottish Association for Marine Science, took on the role of President Elect. There was also a change this year when Dr Mark Fitzsimons stepped down as Honorary Secretary and Dr Gillian Glegg was elected at the EGM in July 2014. Thanks were expressed to Mark for his very orderly hand-over.

A number of reports were tabled and accepted at the meeting. Encouragingly, twenty-one new members were introduced from 8 different countries including 14 student members. It was noted that for ECSA 55 in London, an excellent 455 abstracts had been submitted demonstrating the relevance of the
conferences offered by ECSA to our field of science. Proposals for conferences in Antwerp next Spring and for ECSA 56 in Bremmen in September 2016 were agreed and we will work to ensure an equal level of impact and interest in these meetings.

Estuaries in Focus

The Thames Estuary: A Suitable Case for Treatment?

Francis O'Shea[1], Kate Spencer[1] and Geoff Millward[2]
[1]School of Geography, Queen Mary University of London, Mile End Road, London, UK
[2]Marine Institute, Plymouth University, Drake Circus, Plymouth, UK

Background

From its source near Cirencester, Gloucestershire, the River Thames bisects southern England as it flows over a distance of 346 km. It has a basin area of 14,000 km^2 of which about 40% is designated as an area of outstanding natural beauty (www.simple.m.wikipedia.org/wiki/River_Thames). The estuary courses over 110 km from the weir at Teddington, past the global megacity that is Greater London to Southend-on-Sea at its mouth (Fig. 1). The Thames river estuary supports the lives, both directly and indirectly, of more than 12 million people and the author Peter Ackroyd (2008) has described it as a *Sacred River*. Clearly, the Thames is one of the great rivers in the world which makes it a suitable case for discussion at

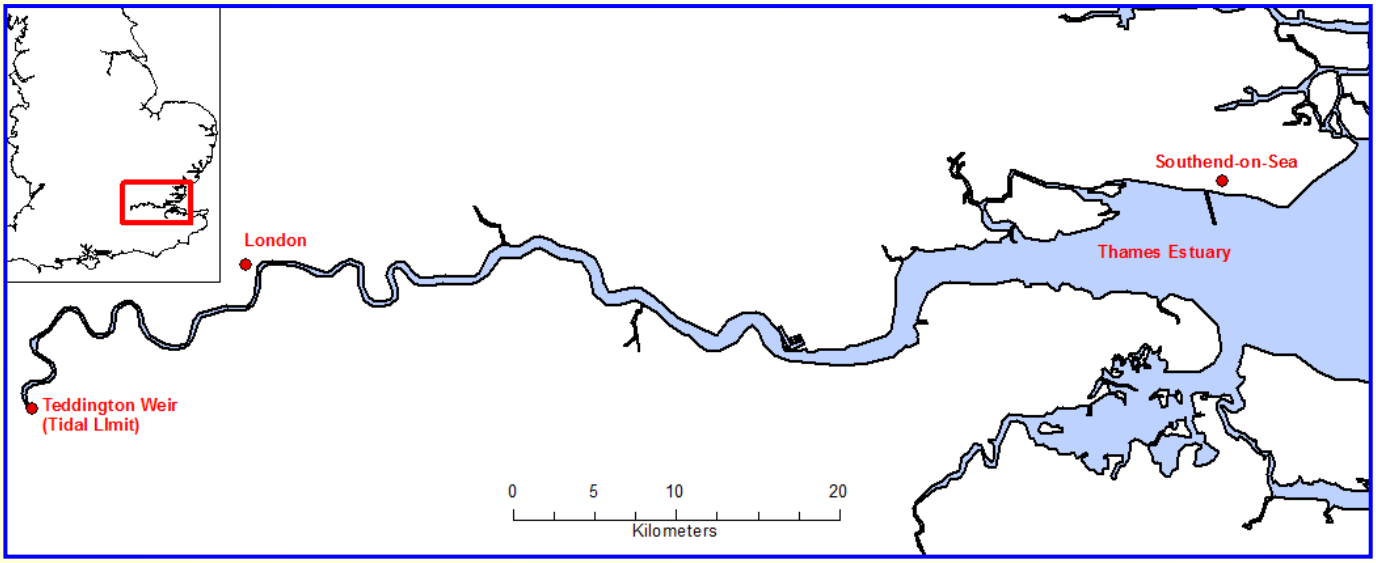

Figure 1: Thames Estuary in South East England.

ECSA-55 in London 6-9 September 2015 (www.ecsa.org).

Even though the estuary is macrotidal, with spring and neap tides of 6.6 m and 3.3 m respectively, it has had a troubled history in respect of pollution dispersal. Instances of the Thames being polluted are as early as the 14th Century, when the river received domestic discharges (Wheeler, 1969). As industry increased London's importance as a centre of commerce vastly expanded the city. In 19th Century, oxygen depleting human wastes and industrial effluents were routinely discharged, leading to severely degraded water quality, with 1858 being referred to as "The Year of the Great Stink" (Attrill, 1998).

In the 1950's the Thames Estuary was thought to be "dead" from the biological point of view. This criticism stirred the relevant authorities to begin a large-scale, coherent restoration project. This was largely managed by the Environment Agency for England and Wales and its antecedent the National Rivers Authority. After several decades of intense remedial work125 species of fish are now being found in the estuary, as well as migratory salmon, sea trout and otters, and the managers have successfully completed 393 habitat enhancement projects over 70 km of the estuary. In October 2010 the International River Foundation (www.riverfoundation.org.au) awarded the prestigious International Theiss River Prize to the River Thames, despite strong competition from the Yellow River in China and the Hattah Lakes in Australia. This extraordinary achievement was largely due to the efforts of the Environment Agency, and the prize money, £218,100, was donated to the Thames Rivers Restoration Trust (www.bbc.co.uk/news/uk-england-london-11527386).**On-going estuarine contamination issues.** Brickworks, steel manufacturers, battery recycling centres, gas works, sewage treatment plants and outfalls are located on, or near, the main channel.

Even though the use of PCB's and organochlorine pesticides have been banned for many years they are still being detected in sediments and eels (Jürgens *et al.*, 2015). However, the PCB levels in eels are relatively low and reflected a declining trend in concentrations. The river is also home to an abundance of physical plastic and sanitary contamination both on the surface and within bed sediments (Morritt *et al.*, 2014).
Nutrients are also of concern, for example the Water Framework Directive target for dissolved phosphorus is 0.12 mg L^{-1} whereas the measured values are ~0.19 mg L^{-1}. A significant diffuse source of phosphorus is wash-off from farmland and discharges from sewage treatment plants. To reduce phosphorus inputs, a 20% reduction in the use of agrochemicals is needed and water companies need to tighten their water treatment practices. Also, the river basin is about 60% permeable chalk and there are concerns about nitrate stored in its aquifers over the past 80 years which, if released to the estuary could enhance eutrophication (Whitehead et al., 2013).

Coastal erosion in the Thames and south east England

London was largely developed on low lying marshland, reclaimed and occupied for industrial, agricultural and domestic purposes (Lavery and Donovan, 2005). The Thames region is threatened by the twin effects of isostatic rebound from the Late Devensian Ice Sheet (Lambeck, 1991) and rising sea level and increased storm intensity (Lavery and Donovan, 2005). Experimental modelling suggests that in the future, areas of up to 1000 km^2 may be regularly flooded, costing up to £3,100 billion in damages (Dawson *et al.*, 2005). As a direct result of the devastating floods in 1953, tidal defences on the Thames have been improved, by constructing the Thames Barrier (Lavery and Donovan, 2005), however this does not provide any protection to sediments in the lower estuary (Figure 2).

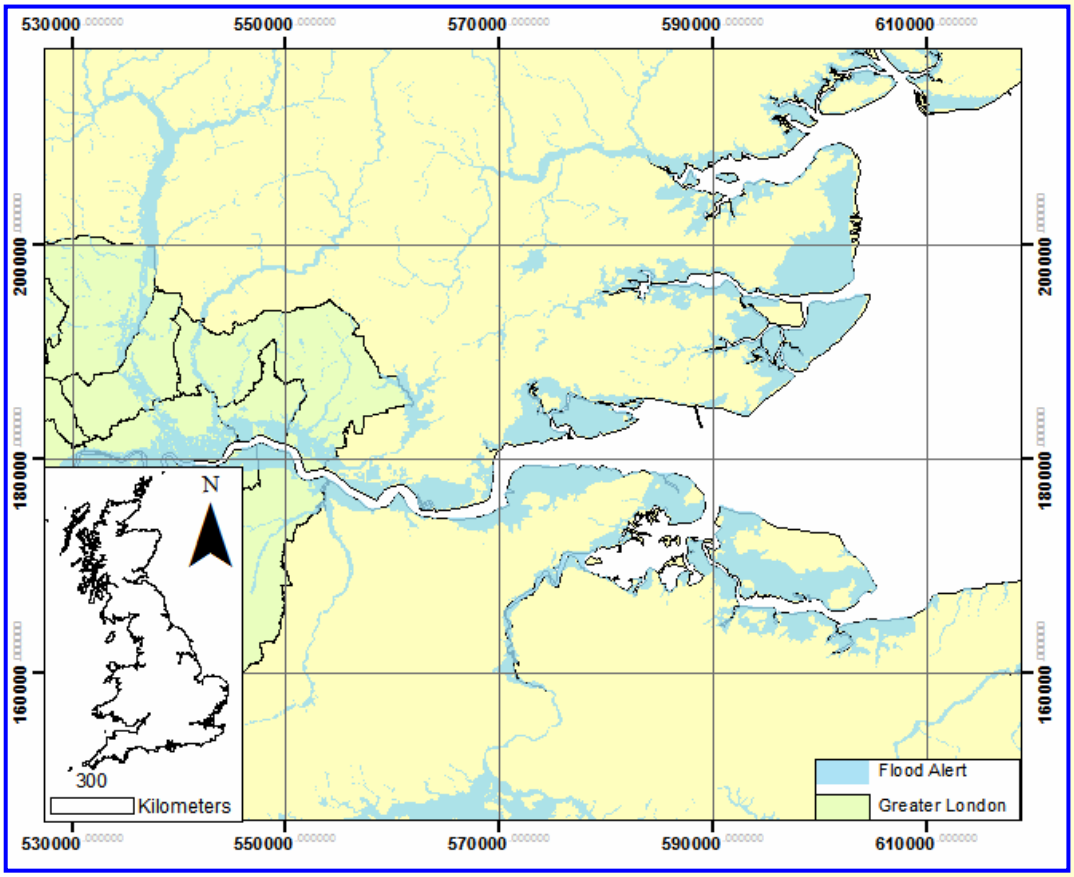

Figure 2: Extent of flooding risk within the South East and Thames area.

Estuaries in Focus *end*

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Photo Thames River Port Authority

On-going research

Relinking of a river to an estuarine World Heritage Site
A management experiment in environmental restoration

Alan Whitfield[1*]
[1]South African Institute for Aquatic Biodiversity (SAIAB), Private Bag 1015, Grahamstown 6140, South Africa
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Problems associated with the natural functioning of Lake St Lucia (Figure 1), South Africa, began in 1914 with the commencement of draining and canalisation of the Mfolozi Swamps to open up the river floodplain for sugar cane cultivation. The main canal, known as Warner's Drain (Photo 1), was completed in 1936 and the sediment filtering capabilities of the swamps in the Mfolozi River floodplain was effectively removed. Prior to this the Mfolozi swamps had acted as a huge filter – retaining sediment and allowing the processed water to pass through into the estuary. It was this sediment-free water that provided St Lucia with most of its freshwater during drought periods when the estuary mouth was closed. As a result of these constructed canals, however, exceptionally high sediment loads from the Mfolozi River started entering the St Lucia system directly and, by the 1940s, serious concerns were expressed about the rate of sedimentation in the combined St Lucia-Mfolozi mouth. In 1950 the whole estuary mouth area became choked up with sediment, completely blocking both systems from the sea. To save floodplain farms from being inundated by the backing-up Mfolozi water, a canal was dredged through to the sea to the south of St Lucia to 'release pressure'. This became the new Mfolozi mouth (Photo 2), an action that was maintained for more than half a century and deprived St Lucia of its single largest freshwater supply.

In addition to the loss of Mfolozi River water to St Lucia, increased human pressures on the remaining rivers that enter the lake (Figure 1) further reduced the runoff of rivers entering the system by about 20%. Droughts in the region occur about every ten years and can be prolonged. A particularly severe drought occurred from 1967 to 1972 when all the rivers entering St Lucia stopped flowing. Large mammals such as hippos had difficulty in finding drinking water and the crocodiles, dying from dehydration and lack of food, had to be airlifted by helicopter away from the worst-affected areas.

At the turn of the century St Lucia again experiencing a prolonged and severe drought which lasted for almost a decade. With the knowledge gained from the previous droughts, the mouth was allowed to close naturally in 2002. Between 2002 and 2010 there was no net gain of water into the St Lucia system due to limited river flow and large-scale evaporation. Indeed, in 2006 only about 10% of very shallow water was left in the lake (Photo 3) and the system was divided into several separate compartments. Major die-offs of fish and invertebrates occurred and the life cycles of most estuary-associated marine species were broken. It was calculated that the loss of St Lucia to the marine and prawn fisheries of the KwaZulu-Natal coastal zone during the drought amounted to at least 60 million UK pounds per annum.

The above drought crisis prompted a request by Ezemvelo KZN Wildlife to the South African Consortium of Estuarine Research & Management to convene a workshop to investigate the availability of information from the estuarine portion of the lower Mfolozi and Msunduzi rivers, thus providing management with the sort of data and ideas that could assist with forward planning, ultimately leading to the re-linkage of the Mfolozi and St Lucia systems. Sponsorship for the Mfolozi/ Msunduzi Indaba (workshop) was obtained from the Water Research Commission (WRC) and in May 2010 more than 20 scientists and conservationists gathered at St Lucia Village to present their research findings and debate future options.

Soon after the indaba, work started on collating the available information into a single report (Bate et al. 2011) which was structured around 14 major contributions from various disciplines, and emphasized that Mfolozi connectivity is of critical importance to the future of St Lucia. The contributions also highlighted the value of the St Lucia system on a national basis and the need for administrators and politicians to support bold management actions going forward.

In an experimental initiative during the winter months of 2008, the Mfolozi estuary mouth was closed and a channel, constructed in the 1960s, linking the Mfolozi to the St Lucia system was opened up, thus allowing relatively sediment-free river water to flow into the St Lucia estuary. In the absence of the river flooding (and associated high sediment loads) the Mfolozi link was retained for six months, resulting in about 15 million m^3 of fresh water entering St Lucia. When the river came down in flood during the start of the rainy season, however, the Mfolozi was breached directly to the sea, rendering the link ineffective to the St Lucia system. The management experiment was repeated in the winters of 2009, 2010 and 2011 but was not a solution to the St Lucia salinity problem, primarily because of the relatively small freshwater volumes delivered to the area during this low flow season.

On-going research *continued*

At Mfolozi/Msunduzi Indaba and in the subsequent report (see Bate et al. 20011 below) evidence was presented which showed beyond reasonable doubt that St Lucia will be unable to survive as a Ramsar and World Heritage Site unless it obtains annual Mfolozi River flow, especially during droughts. The report also showed that subsidence of the Mfolozi/Msunduzi floodplain provided considerable scope as a sediment trap and that active management of a joint Mfolozi/St Lucia mouth could yield considerable benefits for St Lucia at minimal overall risk of excessive sedimentation within the system. In July 2012 a more direct link between the Mfolozi River and the St Lucia Estuary was opened up (Photo 4) and it is hoped that a full restoration of a joint open mouth will be achieved during the summer of 2013/14.

At present, longer-term options for the management of the joint Mfolozi/St Lucia mouth are being investigated using funding from the Global Environment Facility (GEF) of the World Bank. These studies are investigating several restoration options, with the ideal solution being to re-establish parts of the Mfolozi floodplain area as a swamp in order to filter out the river-borne sediment before entering the St Lucia Estuary. Although this may necessitate the purchase of sugar cane farmland that is especially vulnerable to back-flooding, the benefits that would accrue to the St Lucia system as a whole would be enormous.

In conclusion, St Lucia is a resilient ecosystem, and if good freshwater flows can be restored then it can return to its full potential. Within the estuary there are a variety of habitats that will maintain founder stocks of plants and animals that will colonize the system once water levels and exchanges with the marine environment are fully restored. Even in its present recovery state, Lake St Lucia remains the most important estuary in South Africa – but the recent drought has shown us very clearly that this resilient system cannot survive in the long-term if the Mfolozi River is not permanently relinked to this World Heritage Site.

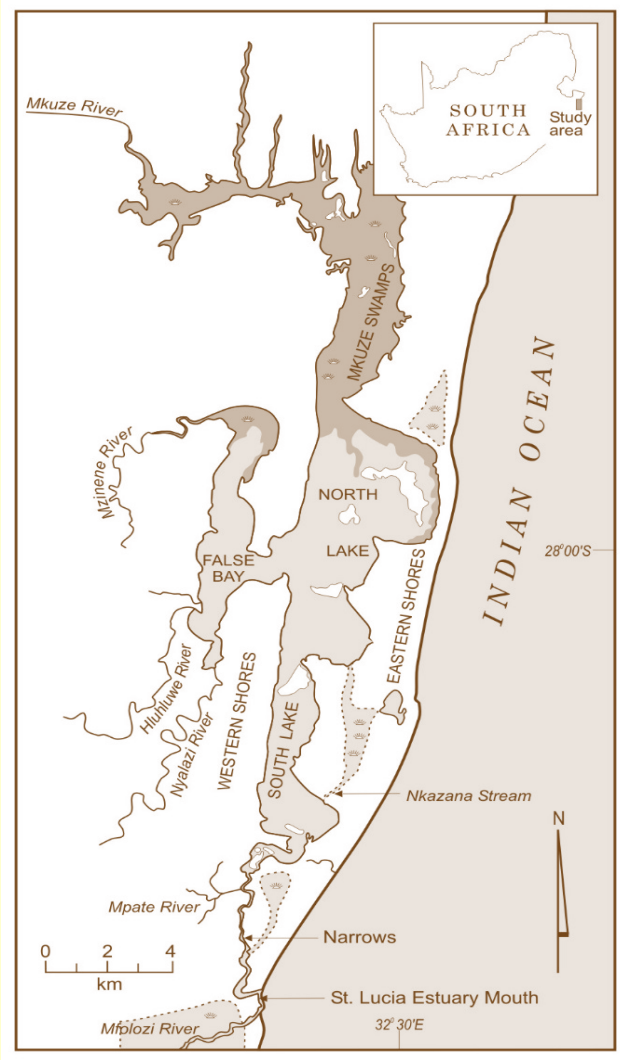

Figure 1. Map of the St Lucia system showing the rivers that flow directly into the lake. Since the early 1950s the Mfolozi River has been diverted to enter the sea just south of the St Lucia Estuary mouth

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On-going research *continued*

Photo 1. Aerial view of Warner's Drain which resulted in the transformation of the Mfolozi swamp into sugar cane fields and released high sediment loads into the St Lucia Estuary during river flooding (Photo: Ricky Taylor).

Photo 2. Aerial view of the closed St Lucia Estuary mouth (foreground) and open Mfolozi mouth (background) during the recent prolonged drought. The Mfolozi has since been relinked to St Lucia by the removal of the sand 'plug' in the centre of the picture (Photo: Ricky Taylor).

On-going research *end*

Photo 3. Ground view of a portion of South Lake during the recent drought. At one stage the water surface area of St Lucia had declined by more than 90%, primarily due to the absence of Mfolozi River water in the system (Photo: Ricky Taylor).

Photo 4. The artificial sand berm behind the primary beach dune was breached in July 2012 to allow Mfolozi River water to flow into the closed St Lucia Estuary mouth (Photo supplied by Nicolette Forbes and iSimangaliso Wetlands Authority).

Conference report

XI Congress of the Russian Hydrobiological Academic Society announced the Laureates of the Honorary Winberg Medal 2014

The Russian Hydrobiological Academic Society (RHAS) originated from the All-Union Hydrobiological Society which was established in 1947 to unite hydrobiologists, enhance the exchange of scientific knowledge and promote ecological education in the Soviet Union. Since 1993, the RHAS is hosted by the Zoological Institute of the Russian Academy of Sciences (Universitetskaya Embankment, 1, 199034 St. Petersburg, Russia; http://www.zin.ru/societies/gbo/). The Society is presently numbering more than 1000 individual members affiliated with 40 regional branches located all over Russian Federation. History of the RHAS and its activities are described in the selected publications listed below.

RHAS has good cooperation with ECSA. In particular, both societies co-organized the International Symposium ECSA-42 ‘‘Estuarine Ecosystems: Structure, Function and Management” on September 16–22, 2007 in the resort town Svetlogorsk (Kaliningrad Region, Russia). This was the Association’s first symposium in Russia. As such, and as shown by the papers in the special issue of Marine Pollution Bulletin (Vol. 61, 2010), this gave the opportunity to expose to a wider audience the vast amount of information and data previously gathered by Russian scientists which has not hitherto been presented in western literature. The Symposium ECSA-42 in Russia highlighted the research priorities aimed at the application of holistic approach to the evaluation and forecasting of ecosystem health and pointed out the necessity of further cooperation between RHAS and ECSA for the effective environmental management of estuaries and other transitional and coastal waters.

The international symposia and congresses organized by the RHAS are essential forums which provide relevant platform for presentation of new results and discussions of top issues in aquatic sciences. The XI Congress of the RHAS was held at the Siberian Federal University in Krasnoyarsk (Russian Federation) on September 22-26, 2014 (http://gbo.sfu-kras.ru/). The participants exceeded 150 society members representing all regional branches of RHAS: from Petropavlovsk-Kamchatsky and Vladivostok in the Far East to Kaliningrad, the western-most region of Russia. The Congress discussed top issues and frontiers of major research fields of the general and applied Aquatic Ecology: structure and functions of aquatic ecosystems of different types, biological resources of marine and inland water bodies, biodiversity and effects of invasive species, fish ecology, symbiotic relations and parasitism in aquatic communities, methods for the assessment of anthropogenic loads and water quality, application of molecular techniques in aquatic ecology, data bases and ecosystem modeling.

One of the central events of the Congress was the announcement of the Laureates of the Honorary Winberg Medal 2014. This award was established by RHAS to commemorate the eminent Russian limnologist, Professor G.G. Winberg (1905-1987), and to honor the outstanding scientists for the considerable contribution to the development of the Theoretical Aquatic Ecology and strengthening the international scientific cooperation in this realm. Since 2006, the Honorary Winberg Medal is awarded by the RHAS at every Congress to three prominent aquatic ecologists: from Russia, from the countries of the Former Soviet Union, and from other foreign countries.

The Laureates of the Honorary Winberg Medal 2014 are: Professor Victor V. Boullion (St. Petersburg, Russian Federation), Professor Vitaliy P. Semenchenko (Minsk, Byelorussia), and Professor Mike Elliott (Hull, UK; Figure 1).

The RHAS congratulates the Laureates of the Honorary Winberg Medal 2014 and acknowledges their outstanding achievements in the Theoretical Aquatic Ecology and remarkable contribution to the international scientific cooperation. Along with the Medal, the Laureates are awarded the title of the Honorary Member of the Russian Hydrobiological Academic Society.

Conference report *continued*

Selected publications on the history of the Russian Hydrobiological Academic Society and its activities:

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Figure 1. The Certificate (left) and the Honorary Winberg Medal 2014 (right) awarded by the Russian Hydrobiological Academic Society to ECSA Council member, Professor Mike Elliott (University of Hull, UK) to emphasize his remarkable contribution to the development of the Theoretical Aquatic Ecology and strengthening the international scientific cooperation.

Forthcoming events

Final programme now available

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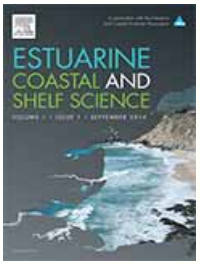

We are excited to announce that the final **programme** for **ECSA 55 - Unbounded boundaries and shifting baselines: Estuaries and coastal seas in a rapidly changing world** is now available to be viewed online.

We have prepared an exciting and stimulating **programme**, which also features 14 **Special Sessions** convened by leading experts from around the world.

Register now to hear from the following outstanding invited speakers:

Dr. Barbara Bischof, *National Oceanographic Partnership Program, USA*

Prof. Juliet Brodie, *Natural History Museum, UK*

Roland Cormier, *Human Dimensions in Coastal Areas, Germany*

Prof. Minhan Dai, *Xiamen University, China*

Prof. John W. Day Jr., *Louisiana State University, USA*

Prof. Salif Diop, *UNEP Senior Environmental Affairs Officer, Professor of Dakar University, Senegal*

Prof. Catherine Lovelock, *The University of Queensland, Australia*

Prof. Robert Nicholls, *University of Southampton, UK*

Dr Ursula Scharler, *University of KwaZulu-Natal, Durban, South Africa*

Prof. Charles A. ("Si") Simenstad, *University of Washington, USA*

Prof. Dr. Stijn Temmerman, *University of Antwerpen, Belgium*

Prof. Eric Wolanski, *James Cook University, Australia*

Prof. Mike Elliott, *Institute of Estuarine and Coastal Studies (IECS), The University of Hull, UK (Introductory Speaker)*

Conference Dinner

The Conference Dinner will take place on **Tuesday 8th September 2015** aboard the **P.S. Elizabethan**, a beautiful replica of a Mississippi stern-wheeled paddle steamer. For more information **click here >>**

Free Conference App – Coming Soon!

ECSA 55 will have its own Free App available on all Android and iOS devices. The App will include information on presentations, speakers, exhibitors and more. It will allow you to plan what presentations to attend, add notes to the program, make lists via the To Do feature and add custom tags to presentations and exhibitors.

Please visit the conference website prior to the event for links to the App and Google Play Stores.

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Dr Henk Schuttelaars
Delft University of Technology, The Netherlands


Thames Estuary - Photo Port of London Authority

Forthcoming events *continued*

2. ECSA Local Meeting:
Estuarine Restoration, July 2016 (date to be determined), University of Antwerp.
Meeting Chair: Prof Patrick Meire.
Major restoration works have taken place in the Schelde estuary over the past decade. New restoration techniques such as reduced tidal systems have been tested and implemented as well as a number of other projects from vegetation management to managed retreat. In total more than 4000 ha of natural habitat will be restored. The major project, Kruibeke Bazel Rupelmonde, in total some 700 ha becomes operational at the end 2015. To celebrate this event the University of Antwerp (together with other local partners, universities and institutes) are organising an ECSA Local Meeting (3-4 days) on estuarine restoration. The meeting will focus on:

the objectives of restoration;
- species oriented
- habitat oriented
- system oriented

the reasons for success or failure of restoration projects
- Sedimentation
- vegetation development
- fauna, including microbiota
- ecological functioning
- local impact versus impact on functioning of the whole estuary

the different types of restoration projects
the importance of the ecosystem services concept in restoration
the role of environmental legislation as a driver for restoration

Universiteit Antwerpen

The conference will bring together both scientists and practitioners and result in guidelines for further estuarine restoration projects. The projects along the Schelde will be the central element of the conference but the conference aims to discuss estuarine restoration in the wider context and will bring together delegates from all important European estuaries.

3. ECSA 56: Coastal systems in transition. Bremen, 4– 7 Sept 2016.
Conference Chair: Dr Tim Jennerjahn

Humans are drivers of and affected by global change. Human-induced global climate and regional environmental change dramatically modify the structures and functions of coastal systems driving them into a new system state. The altered resource potentials and ecosystem services then, in turn, significantly affect the livelihoods of the population. Distinguishing between natural and anthropogenic control factors and quantifying their impacts is a major challenge in the investigation of hydrodynamic, sedimentological, biogeochemical, ecological and socioeconomic processes in the coastal zone. Inter- and transdisciplinary efforts are required to gain a profound understanding of these "novel" systems, which provides the basis for a sustainable management. In this context three key questions arise:

How can we assess system states?

How can we distinguish between natural controls and anthropogenic impact?

How can we manage coastal systems sustainably?


Thames Estuary - Photo Port of London Authority

Forthcoming events *end*

Topics:

Changing physical settings and processes
Coastal morphodynamics affected by engineering structures and sea level rise
From measuring to modelling hydro- and sediment dynamics
Impact of extreme events on coastal systems
Monitoring with coastal ocean observing systems

Biogeochemical processes and fluxes at the land – sea interface
Role of aquaculture for the pollution of coastal waters
From catchment to coast: effects of land use change and hydrological regulations
Carbon and nitrogen cycling in benthic and pelagic ecosystems
Impact of ocean acidification on coastal systems
Blue carbon: assessing the role and carbon storage potential of coastal wetlands

Shifting ecosystem structures and functions
Biodiversity in coastal systems in low vs. high latitudes and "Old World vs. New World"
Role of functional and response diversity to changes for ecosystem resilience
Linkages between estuaries, mangroves, seagrass beds and coral reefs
Stress responses and resilience: from molecular to ecosystem level

The human dimension: impact, management, governance
Resource use patterns and management and implications for the environment
Participatory management approaches in coastal zone management
Marine and coastal spatial planning/Decision support
Valuing marine ecosystem services
Governing the commons: institutions for the sea/Marine Governance

4. ECSA Local Meeting:
Coasts and Estuaries of Southern England, 4-6 April 2017. Portland Building, University of Portsmouth.

University of Portsmouth

ECSA

Thames Estuary - Photo Port of London Authority

Work in Progress

Salt marsh plants key to reducing coastal erosion and flooding

The capability of intertidal vegetated environments such as salt marshes and mudflats in reducing wave energy under extreme storm conditions has recently been investigated by a team led by Iris Möller at the Cambridge Coastal Research Unit. Coastal margins are under increasing pressures from both environmental forcing, including sea-level rise and increased storminess as well human pressures such as increased population densities. Consequently, coastal risk and reduction methods are now being reviewed and many coastal landforms such as salt marshes have been recognised as potential barriers to wave and tidal flows. Over the past 20 years salt marshes had been shown to act as an effective natural buffer to incident wave energy however their performance in this capacity during extreme conditions had been poorly understood. Previous empirical studies of wave reduction over vegetated canopies had been limited to low water depths (<1 m) and wave heights (<0.3 m). For this experiment, over 200 m^2 of salt marsh was transported in more than 200 individual blocks from North Germany and re-assembled in a 300-m-long, 5-m-wide and 7-m-deep wave flume. The blocks were assembled in the flume to represent a mixed canopy typical of a mid to high southern North Sea marsh. Water depths up to 2m above the marsh surface with regular and irregular non-breaking waves in excess of 0.9m height were generated to replicate storm conditions. The results of the study found that the presence of vegetation caused significant wave attenuation, even when subjected to the highest waves and water depths. Observations of plant flexibility during the experiment suggest that more energetic waves were allowed to skim over the canopy rather than travel though the vegetation and thus the wave retained more energy. Overall however, the vegetation alone was found to account for around 60 % of observed wave attenuation as well as reducing erosion of the marsh bed. The effectiveness of storm wave dissipation and resilience of salt marsh highlights the important role these ecosystems can play as components of more sustainable and diverse forms of coastal defence.

The research was supported by the European Community's 7th Framework Programme and a grant from The Isaac Newton Trust, Trinity College, Cambridge.

See more at: http://www.cam.ac.uk/research/news/salt-marsh-plants-key-to-reducing-coastal-erosion-and-flooding#sthash.oaG14qDc.dpuf
This study was published
in *Nature Geoscience* **7**, 727-731 (2014).
Further information can be found at
thesaltmarshexperiment.wordpress.com and @UCamCoast

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.

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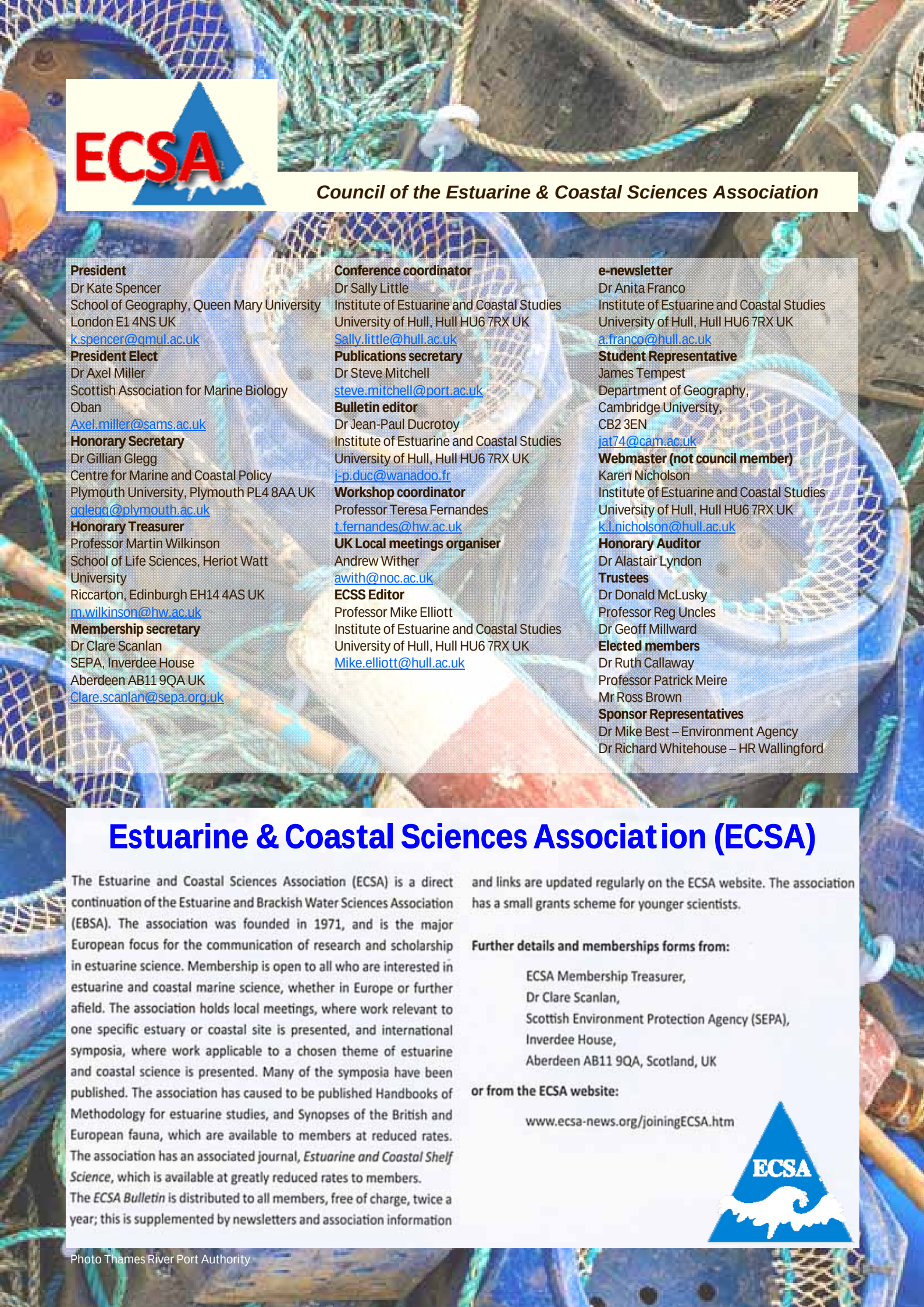

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The Estuarine and Coastal Sciences Association (ECSA) is a direct continuation of the Estuarine and Brackish Water Sciences Association (EBSA). The association was founded in 1971, and is the major European focus for the communication of research and 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:

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or from the ECSA website:

www.ecsa-news.org/joiningECSA.htm

Photo Thames River Port Authority