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The 13th International Estuarine Biogeochemistry Symposium: 'Estuaries and bays under anthropogenic pressure: past-present-future'

The 13th International Estuarine Biogeochemistry Symposium (IEBS 13) held in Bordeaux, France from 7th to 10th June 2015, attracted 97 participants and contributions from five continents. This symposium was entitled 'Estuaries and bays under anthropogenic pressure: past-present-future' addressing estuaries and coastal regions from all climatic zones.

An historical overview of the meeting series held over the past three decades was presented by Thomas M. Church in the presence of Bjorn Sundby, both founding members of the International Scientific Committee of IEBS (Table 1). This retrospective insight, together with contemporary keynotes by Michael Depledge and Andrew Cundy, afforded an understanding and evaluation of the progress of the study of biogeochemistry in estuarine and coastal regions. Complementing this perspective, the current symposium also posed interesting and challenging scientific questions for the present and future, which are of particular relevance to many participating early-stage researchers. The range and significance of the scientific contributions in this long symposium series are captured in regular Special Issues of *Marine Chemistry* (Table 1).

Table 1
History of the International Estuarine Biogeochemistry Symposium series (based on an oral presentation by Thomas M. Church at the 13th IEBS, Bordeaux 2015).

	Location	Date	Topic/Theme	Reference
"Prehistory": *International Symposium on the Chemistry of the Mediterranean* (ISCM): Residence time, conceptual models, speciation controls of micro constituents, and heterogeneous processes in coastal waters.				
	Primosten, Yugoslavia	May 1984		MAR CHEM 18, 1986
	Rovinj, Croatia	May 1992		not published
Transition to *The International Symposium on the Biogeochemistry of Model Estuaries* (ISBME)				
1st	Primoten, Yugoslavia	May 1989	Physical, chemical and biological processes in stratified estuaries	MAR CHEM 32, 1989
2nd	Jekyll Island, GA, USA	April 1991	Estuarine processes in global change	MAR CHEM 43, 1993
3rd	Svetlogorsk, Russia	April 1993	Fate of chemical elements and compounds in aerotidal (Arctic) estuaries	MAR CHEM 53, 1996
4th	Nantes, France	April 1995	Fate of organic compounds and trace metals in macrotidal estuaries	MAR CHEM 58, 1997
5th	Rimouski, Canada	May 1997	New approaches to estuarine chemistry	MAR CHEM 65, 1999
6th	Ispra, Italy	July 2000	Large deltas and their impact on coastal zones: processes beyond the estuary boundaries influenced by river discharge	MAR CHEM79, 2002
7th	Grimstad, Norway	May 2002	Biogeochemical processes in high latitude and subtropical estuaries	MAR CHEM 83, 2003
Transition to *The International Estuarine Biogeochemistry Symposium* (IEBS)				
8th	Solomons, Maryland, USA	May 2004	Tracing interface processes, mixing dynamics, and new techniques	MAR CHEM 102, 2006
9th	Warnemünde, Germany	May 2006	Estuaries and enclosed seas under changing environmental conditions	MAR CHEM 107, 2007
10th	Xiamen, China	May 2008	Estuaries in a changing world	MAR CHEM 117, 2009
11th	Chapel Hill, North Carolina, USA	May 2011	Crossing boundaries: Examining sources and sinks within and through estuarine systems	not published
12th	Plymouth, UK	June 2013	An integrated approach to estuarine biogeochemistry	MAR CHEM 167, 2013
13th	Bordeaux, France	June 2015	Estuaries under anthropogenic pressure	MAR CHEM, this issue
14th	Rimouski, Canada	June 2017	Theme: to be decided	

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This Special Issue in Marine Chemistry contains papers illustrating the range of estuarine and coastal research fields of interest in the past, present and near future. Apart from contributions relating to ongoing scientific questions in many diverse fields, particular thematic highlights of IEBS 13 that clearly pointed towards future research trends were:

1) A special session dedicated to **high resolution environmental monitoring** strategies, technologies and modeling (e.g. Caetano el al., this issue). This session was co-organized by the consortium of the European Research project 'Integrated in Situ Chemical Mapping probes' (SCHeMA; EU-FP7 OCEAN; http://www.schema-ocean.eu) whose aim is to develop new remote-control online sensing systems for the in situ surveillance of coastal water quality.
2) **Coastal and estuarine acidification**, related to anthropogenically-modified nutrient and carbon cycles, and their effects on water quality and ecosystem health were the focus of both experimental (e.g. Anschutz et al., this issue) and modelling (Wild-Allen et al., this issue) studies; several presentations suggested irreversible trends that require urgent attention.
3) Contributions on **emerging inorganic contaminants**, such as platinum group elements or the rare earth elements, reinforced one of the key themes raised at the previous IEBS in Plymouth (e.g. Abdou et al., Almecija et al., both this issue). With a growing relevance of such technology-critical elements (TCEs) there are needs for a better understanding of their environmental roles, effects and fates (www.costnotice.net).
4) **Artificial radionuclides** of some trace elements (e.g. Cs, Sb, Te, Sn) may be produced and released into the marine environment; large-scale, acute accidental releases in particular (e.g. Fukushima) capture the concerns of the global public. As many of these radioactive elements are short-lived and our knowledge of their biogeochemical cycling in coastal waters extremely limited, scenarios on post-accident dispersion and fate rely on studies on their stable homologues (Gil et al, this issue). However, contrary to stable isotopes these radionuclides decay into other chemical elements with different biogeochemical behaviors, inducing additional complexity and introducing a new challenge: integrated biogeochemistry of radionuclides and their descendants in coastal systems.

We are grateful to the participants, speakers, scientific and local organizing committees for making the meeting a success and look forward to the 14th IEBS symposium to be held in June 2017 in Rimouski, Canada.

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