

50th International Liege Colloquium on Ocean Dynamics

Long-term studies in oceanography – a celebration of 50 years of science at the Liege Colloquium

Liège, Belgium – 28th May to 1st June 2018



Monday, May 28th, 2018

08:15 - 9:20	Registration			
9:20 - 9:30	Welcome note			
9:30 - 9:40	Welcome speech by University of Liège Rector M. Albert Corhay			
Session 1 – Long-term trends in oceanography (I)				
Chair - Michael Chil				
09:40 - 10:10	KEYNOTE: Benoit Cushman Roisin	Physical Oceanography Progress over the last 50 years	Darhmouth	USA
10:10 - 10:30	Grégoire M., et al	Declining oxygen in the global ocean and coastal waters	MAST - University of Liège	Belgium
10:30 - 10:50	Schuette F., Hahn J., Frenger I., Weller R., Czeschel R., Stramma L.	Is zonal eddy supply a contributor to decadal oxygen changes?	Geomar	Germany
10:50 - 11:10	Coffee break			
11:10 - 11:30	Lee T., Alvera-Azcárate A., Boutin J., Lagerloef G., Sabia R., Stammer D., Turiel A., Yueh S., Reul, N.	The importance to continue and enhance satellite salinity observations to study long-term variability of the ocean	Jet Propulsion Laboratory	USA
11:30 - 11:50	Stendardo I., Steinfeldt R., Rhein M.	High-resolution long-term observations of salinity transport along the pathway of the North Atlantic Current at 47°N	University of Bremen	Germany
11:50 - 12:10	Salat J., Pascual J.	44 years of oceanographic and meteorological observations at a coastal station in the NW Mediterranean	Institut de Ciències del Mar (CSIC)	Spain
12:10 - 14:00	Break			
Session 2- Session: Coastal and Regional Processes (I)				
Chair - Robert Weller				
14:00 - 14:30	KEYNOTE: Anny Cazenave	Present-day ocean warming, land ice melt and sea level rise	LEGOS	France
14:30 - 14:50	Kudryavtseva N., Pindsoo K., Soomere T.	Non-stationary modeling of trends reveals spatial patterns of variations in extreme water level changes along the Baltic Sea coast	Tallinn University of Technology	Estonia
14:50 - 15:10	Capuzzo E., Stephens D., Silva T., Baryy J., Forster R.	Decrease in water clarity of the southern and central North Sea during the 20th century	CEFAS	United Kingdom
15:10 - 15:30	Ruiz Villarreal M. et al	Variability of circulation and ecosystem response along the N and NW Iberian Atlantic coast	Instituto Español de Oceanografía	Spain
15:30 - 16:00	Coffee break			
16:00 - 16:20	Hummels R. et al	Observed variability of the tropical Atlantic Boundary Circulation Systems at 11°S	Geomar	Germany
16:20 - 16:40	Bahamondes Dominguez A.	Meteorological controls on primary production in shelf seas from 1965-2015	University of Southampton	United Kingdom
16:40 - 17:00	Fettweis M., Riethmüller R., Verney R., Becker M.	Uncertainties associated with long-term observations of suspended particulate matter concentration using optical and acoustic sensors	Royal Belgian Institute of Natural Sciences, OD Nature	Belgium
17:00 - 17:20	Capuzzo E.	A decline in primary production in the North Sea over twenty-five years, associated with reductions in zooplankton abundance and fish stock recruitment	CEFAS	United Kingdom
17:20 - 17:40	Gypens N., Ghyoot C. And Borges A.V.	Modelling five decade of climatic gases (dimethylsulfide and carbon dioxide) in the Southern Bight of the North Sea	Ulg - UOC	Belgium
17:40 - 20:00	Ice Breaker party: Place: University of Liège - Salle des Professeurs			

Tuesday, May 29th, 2018

Session 3 - Ocean dynamics & climate change

Chair - Tony Lee

09:00 - 09:30	KEYNOTE: M. Ghil	Ocean dynamics and climate change	UCLA	USA
09:30 - 09:50	Delman A., Lee T., Qiu B.	Interannual variability and long-term trend of mesoscale eddy kinetic energy in the subtropical southern Indian Ocean	Jet Propulsion Laboratory	USA
09:50 - 10:10	Ramstein G., Su B., Jiang D., Zhang R., Sepulchre	Intensified Atlantic vs. weakened Pacific meridional overturning 1 circulations in response to Tibetan Plateau uplift	LSCE-CEA SACLAY	France
10:10 - 10:30	Soto-Navarro J., Jordà G., et al	The Mediterranean Sea water properties and their future projections in an ensemble of coupled ocean – atmosphere models	Mediterranean Institute for Advanced Studies (IMEDEA)	Spain
10:30 - 11:00	Coffee break			
11:00 - 11:20	Sánchez Leal R.F.	Mediterranean Overflow Water in the Gulf of Cádiz: past, present and future	Spanish Institute of Oceanography	Spain
11:20 - 11:40	Pinardi N., Cessi P., Borile F.	The Mediterranean Sea Conveyor Belt system	Department of Physics and Astronomy, University of Bologna	Italy
11:40 - 12:00	Schaeffer A., Roughan M.	Marine heatwaves off southeastern Australia: subsurface intensification	UNSW	Australia
12:00 - 14:00	Break			
14:00 - 14:20	Xie J., Bertino L., Counillon F.	Quality assessment of the TOPAZ4 reanalysis in the Arctic over the period 1991-2013	Nansen Environmental and Remote Sensing Center	Norway
14:20 - 14:40	Ponsar S., Van Den Eynde D., Luyten P.	Climate change impact on storm surges and waves on the Belgian Continental Shelf	Royal Belgian Institute of Natural Sciences	Belgium
14:40 - 15:50	Poster Session - Coffee break			

Session 4 - Biogeochemical processes (I)

Chair - Marilaure Grégoire

15:50 - 16:10	Capet A., Vandenbulcke L., Grégoire M.	Evolution of the Black Sea ventilation regime during the last warming decades	MAST - University of Liège	Belgium
16:10 - 16:30	Ciancia E. et al	A multi-temporal analysis of MODIS-Aqua Level 3/Level 2 data for investigating the chlorophyll-a variability in the Gulf of Taranto (North-western Ionian Sea)	School of Engineering, University of Basilicata	Italy
16:30 - 16:50	Ramirez-Romero E. et al (<u>Jorda</u>)	Assessment of biogeochemical models in the NW Mediterranean	Mediterranean Institute for Advanced Studies, IMEDEA (CSIC-UIB)	Spain
16:50 - 17:10	Borges A. And Champenois W.	Inter-annual variations over a decade of primary production of the Mediterranean seagrass Posidonia oceanica	Ulg - UOC	Belgium
17:10 - 17:30	Bode A., et al	Changes in phytoplankton production and upwelling intensity off A Coruña (NW Spain) for the last 28 yr	Instituto Español de Oceanografía	Spain

Wednesday, May 30th, 2018

Session 5 - Oceanic climate records (datasets, methods and comparisons)

Chair - Nadia Pinardi

09:00 - 09:30	KEYNOTE: Mike McPhaden	El Niño and the Southern Oscillation: A 50-year Retrospective	NOAA/PMEL	USA
09:30 - 09:50	Kaplan A.	Small-Scale Variability in Sea Surface Temperature: Estimates From Drifting Buoys and Other Sources	LDEO of Columbia University	USA
09:50 - 10:10	Yang C., Storto A., Masina S.	The Relative Effect of Observational Constrain and Atmospheric Forcing Uncertainty on Historical Ocean Reanalyses	FUGRO GB Marine Ltd	United Kingdom
10:10 - 10:30	Ballarotta M.,	DUACS-DT2018: 25 years of reprocessed altimetric products	Collecte Localisation Satellites (CLS)	France
10:30 - 11:00	Coffee			
11:00 - 11:20	Amores A., Jordà G.	Up to which extent can we characterize ocean eddies using present-day altimetric products?	IMEDEA (UIB-CSIC)	Spain
11:20 - 11:40	Alory G.	A global and multidecadal Sea Surface Salinity dataset from the French Voluntary Observing Ships network	LEGOS	France
11:40 - 12:00	Reverdin G., Friedman A.	Surface Atlantic variability during the last 120 years	LOCEAN, CNRS	France
12:00 - 14:00	Break			

Session 5 - Oceanic climate records (datasets, methods and comparisons)

Chair - Mike McPhaden

14:00 - 14:30	KEYNOTE: Karina von Schuckmann	Insights into the role of the oceans in the Earth energy budget	Mercator Ocean	France
14:30 - 14:50	Ponsoni L., Massonnet F., Fichefet T., Chevallier M.	Designing an optimal Arctic sea ice thickness observing system based on long-term ocean-ice reanalyses	Georges Lemaître Centre for Earth and Climate Research (TECLIM), Université catholique de Louvain	Belgium
14:50 - 15:10	Handmann P. et al	The Deep Western Boundary Current in the Labrador Sea from Observations and a high-resolution model	GEOMAR	Spain
15:10 - 15:30	Jorda G. et al	Mapping the temperature and salinity of the Mediterranean Sea from 1950 to present. Product description and sources of uncertainty	IMEDEA/ Universitat de les Illes Balears	Spain
15:30 - 15:50	Margirier F.	Warming and salting of the Mediterranean, from yearly datasets to monthly monitoring	Laboratoire d'Océanographie et du Climat: Expérimentations et Approches Numériques (LOCEAN)	France
15:50 - 16:50	Poster Session - Coffee break			
16:50 - 17:10	Weller R. et al	Driving Improved Understanding in the Eastern South Pacific with a Long-Term Ocean Reference Station	Woods Hole Oceanographic Institution	USA
17:10 - 17:30	Plueddemann A., Bigorre S., Weller R.	Air-Sea fluxes from an ocean reference station in the northwest tropical Atlantic	Woods Hole Oceanographic Institution	USA
19:30 - 22:00	Colloquium Dinner: Place: Hotel - Les Comtes de Méan ***** - 19:30: Reception - 20:00: Dinner			

Thursday, May 31st, 2018

Session 2 - Coastal and regional processes (II)

Chair - Jean-Marie Beckers

09:00 - 09:30	KEYNOTE: Emil Stanev	From process studies to operational oceanography. Regional and coastal ocean examples	HZG	Germany
09:30 - 09:50	Bensoussan N. et al	Long-term temperature variability and local trends in coastal waters of Mediterranean MPAs: an updated analysis combining high-resolution satellite and in situ time series	Institute of Marine Science - CSIC	Spain
09:50 - 10:10	Goffart A. et al	Interaction between climate forcing and plankton communities in a pristine NW Mediterranean site, the Bay of Calvi (Corsica): a long term study (1979-2016)	University of Liège	Belgium
10:10 - 10:30	Pindsoo K., Soomere T.	Variation of trends in extreme sea levels along the Baltic Sea coast	Tallinn University of Technology	Estonia
10:30 - 11:00	Coffee			
11:00 - 11:20	Thomas H., Pätsch J.	The Temporal Variability of the North - results from observational and modeling studies	Dalhousie University	Canada
11:20 - 11:40	Salinas Prieto J.A	Distribution of extreme waves in Mexican coasts	Mexican Institute of Water Technology	Mexico

Session 1 – Long-term trends in oceanography (II)

Chair - Emil Stanev

11:40 - 12:00	Mauzole Y., Cornillon P.	Objective mapping of persistent SST fronts based on global satellite	JPL/Caltech	USA
12:00 - 12:20	Wang J.	Surface current in “Hotspot” serves as a new and effective precursor for El Niño prediction	Institute of Oceanology Chinese Academy of Sciences	China
12:20 - 14:00	Break			
14:00 - 14:20	Drévilion M., Von Schuckmann K., Le Traon P.-Y.	The CMEMS global and regional ocean multi-year products: towards a consistent set of high resolution ocean reanalyses and reprocessing products for operational oceanography users and ocean state reporting and monitoring.	Mercator	France
14:20 - 14:40	Savoie N.,	Climate and local-driven changes in coastal marine systems and consequences on phytoplankton biodiversity in western Europe	Univ. Bordeaux/EPOC	France
14:40 - 15:00	Le H.M. et al	4DEMON: A novel approach to model 4 decades of sediment contaminants	Royal Belgian Institute of Natural Sciences	Belgium
15:00 - 15:20	Garcia-Jove M., Sheinbaum J., Jouanno J.	Sensitivity of Loop Current metrics and eddy detachments to different model configurations: The impact of topography and Caribbean perturbations	Marine Institute	Ireland
15:20 - 15:40	Cardin V.R.,	Long-term variations of thermohaline properties in the Adriatic from the 30-year time-series	OGS - Istituto Nazionale di Oceanografia e di Geofisica Sperimentale	Italy
15:40 - 16:10	Coffee break			

Session 4 - Biogeochemical processes (II)

Chair - Arthur Capet

16:10 - 16:30	Zhang W., Wirtz K., Schrum C.	Variation of organic carbon cycling modulated by benthic animals in the North & Baltic Sea in the past three decades	Institute of Coastal Research, Helmholtz-Zentrum Geesthacht	Germany
16:30 - 16:50	Freeman N. et al	On the relationship between fronts and biogeochemistry in Drake Passage	Scripps Institution of Oceanography, University of California San Diego	USA
16:50 - 17:10	Keerthi M.G. et al	Intraseasonal to interannual scale interactions in Chlorophyll time series: assessment from combined ocean color and long-term monitoring at the Boussole mooring	CSIR-NIO, Goa University	India
17:10 - 17:30	Tjiputra J. et al	Early detection of anthropogenic climate change signal using the interior oxygen in the subpolar North Atlantic	Uni Research Climate	Norway
17:30 - 17:50	Saran Rajendran, Sreeush M.G., Valsala Vinu	Seasonality and trends in Western Arabian Sea acidification and its controlling factors	Cochin University of Science and Technology	India

Friday, June 1st, 2018

Session 6 - Trends in polar regions

Chair - Hugues Goose

09:00 - 09:40	KEYNOTE: Julienne Stroeve	Changing state of sea ice across all seasons	NSIDC	USA
09:40 - 10:00	Hoppema M.	Three decades of repeat sections of hydrography and chemical variables through the Weddell Gyre, Southern Ocean	Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research	Germany
10:00 - 10:20	Lecomte O. et al	Vertical ocean heat redistribution sustaining sea-ice trends in the Ross Sea	UCL-ELI-TECLIM	Belgium
10:20 - 10:40	Docquier D., et al	Impact of ocean heat transport on Arctic sea ice	UCL	Belgium
10:40 - 11:00	Coffee			
11:00 - 11:20	Platov G et al	Modeling of climate tendencies in Arctic Seas based on atmospheric forcing EOF decomposition	Institute of Computational Mathematics and Mathematical Geophysics	Germany
11:20 - 11:40	Prandi P. et al (<u>Ballarotta M.</u>)	Retrieving sea surface topography in the Arctic Ocean from satellite altimetry with ocean/sea-ice processing continuity	CLS	France

Session 1 – Long-term trends in oceanography (III)

Chair - Aida Alvera-Azcárate

11:40 - 12:00	Mouchet A.,	How well does radiocarbon record deep-ocean ventilation changes? A coupled climate model study of the last termination.	GHER - University of Liège	Belgium
12:00 - 14:00	Break			
14:00 - 14:20	Dilmahamod Fehmi	The SIDDIES corridor: A major pathway of long-lived surface 1 and subsurface eddies in the subtropical South Indian Ocean.	University of Cape Town	South Africa
14:20 - 14:40	Kostianoy A.	Satellite Monitoring of the Ocean Climate parameters	P.P. Shirshov Institute of Oceanology	Russia
14:40 - 15:10	Coffee break			
15:10 - 15:30	Chu P., Fan C.	Establishment of Near-Real Time Monthly Gridded (T, S, u, v) Dataset from the World Ocean Database (WOD) Using Optimal Spectral Decomposition and P-Vector Method	Naval Postgraduate School	USA
15:30 - 15:50	Troupin C., Peelen C., Alvera Azcárate A., Barth A., Watelet S., Beckers J.-M.	History of the participation to the Colloquium: spatial analysis and time series	GHER - University of Liège	Belgium
15:50 - 16:10	End of the Colloquium			

Posters

Session 1 – Long-term trends in oceanography

1	BEKAERT K., LE H.M., LAGRING R., RUTTENS A., WAGENEERS N., AMPE B., DE WITTE B.	4DEMON: Centralization and valorization of 4 decades of biota contaminant data in the Belgian Part of the North Sea	ILVO	Belgium
2	EDIANG O., EDIANG A.	Climate Information and Sustainable development : an overview in west Africa coastal areas	NIGERIAN METEOROLOGICAL AGENCY	Nigeria
3	KULKARNI B., KERKAR P., RAHULE D.	Impact of climate change on fisheries and aquaculture in India	PVG'S College of Science and Technology	India
4	LAGRING R., VANDER ZANDE D., LE H.M., DESMIT X., NOHE A., TYBERGHEIN L., SABBE K.	Long-term dataset on underwater light availability in the Belgian Part of the North Sea between 1970 and 2015	RBINS-OD Nature	Belgium
5	MANTZIAFOU A., POLIOU D., SOFIANOS S.	20 years study of the barotropic relative vorticity and the eddy kinetic energy of the Mediterranean Sea (1993-2012)	University of Athens, Faculty of Physics, Ocean Physics and Modelling Group	Greece
6	NOHE A., GOFFIN A., TYBERGHEIN L., LAGRING R., DE CAUWER K., VYVERMAN W., SABBE K.	Long-term anthropogenically-induced change in North Sea phytoplankton: changes in diatom and dinoflagellate biomass, community structure and seasonality in the Belgian part of the North Sea between 1970 and 2010	Laboratory of Protistology & Aquatic Ecology, Department of Biology, University of Ghent	Belgium
7	NOVELLINO A., GORRINGE P.	EMODnet Physics	ETT solutions	Italy
8	PINARDI N., LYUBARTSEV V.	Mean sea level tendencies in world ocean regional seas: a reanalysis perspective	University of Bologna	Italy
10	WANG F.	Facing the future: Center for Ocean Mega-Science, Chinese Academy of Sciences	Institute of Oceanology, Chinese Academy of Sciences	China

Session 2 - Coastal and regional processes

11	BESIKTEPE S.	Identification of basic physical and biogeochemical dynamical processes in the Izmir Bay using Coastal Ocean Observing System	Dokuz Eylul University Institute of Marine Sciences and Technology	Turkey
13	CHOI J., HWANG D.	Applicability of Coloured Dissolved Organic Matter (CDOM) induced by Geostationary Ocean Colour Imager (GOCI) to the mapping of Sea Surface Salinity (SSS) in Korean coastal waters	Korean Institute of Ocean Science and Technology	Korea
14	DIANSKY N., GRUZINOV V., STEPANOV D.	On the coastal-trapped internal wave phase speed and internal Rossby radius of deformation in the Black Sea	Lomonosov Moscow State University	Russia
15	FLOREZ-LEIVA L., BERNAL C., CONTRERAS S., MARTINEZ L., PORTILLO L., ROBLEDO A., HINCAPIE C., OSORIO J., CORDOBA MENA N., BEDOYA S., LOPEZ T., PACHECO W., BARRAGAN A.	Gulf of Urabá a tropical estuary: What do we know?	Universidad de Antioquia	Caribe colombiano
16	HIDALGO MAYO A. AND MITRANI ARENAL I.	Methodology for the study of coastal flooding in Cuba. Study Case Gibara- Baracoa littoral, Cuba	Centro Meteorológico Provincial de Holguín. Instituto de Meteorología	Cuba
17	HUSREVOGLU S., AL-ANSARI E.	Investigation of long-term, basin-scale thermohaline trends in Qatar's marine region in response to environmental and climatic change	Qatar University	Qatar
18	IVANOV E., CAPET A., BARTH A., DELHEZ E., SOETAERT K., GRÉGOIRE M.	Modelling the hydrodynamics of the Southern Bight of the North Sea: Skills assessment of different configurations (i.e. nesting) in the perspective of coupling with sediment transport	MAST, University of Liège	Belgium
19	KRYLENKO M., KRYLENKO V.	Variability of the Dolgaya spit in XX-XXI centuries	Shirshov Institute of Oceanology RAS	Russia

20	MALAKHOVA V., GOLUBEVA E., PLATOV G.	Sensitivity of the Arctic Ocean gas hydrate to contemporary climate changes	Institute of Computational Mathematics and Mathematical Geophysics, SB RAS	Russia
21	MANDANG I., RUSDIN A.	A Numerical Modeling of Deposition, Erosion, and Flux Cohesive Sediment In Mahakam Estuary, East Kalimantan, Indonesia	Faculty of Science Mulawarman University	Indonesia
22	PLATOV G., GOLUBEVA E.	Simulation of the interannual and seasonal variability of hydrography and circulation in the Laptev Sea	Institute of Computational Mathematics and Mathematical Geophysics	Germany
24	VERWAEST T., HOUTHUYS R., DAN S., MONTREUIL A.-L., CHEN M., THOON D.	35 years of monitoring the Belgian sandy coastline	Waterbouwkundig Laboratorium	Belgium
Session 3 - Ocean dynamics & climate change				
27	AGUIAR-GONZÁLEZ B., PONSONI L., ULLGREN J., DE RUIJTER W.P.M., MAAS L.R.M.	Intercomparison study of volume transport and variability of the Mozambique Channel Throughflow and East Madagascar Current based on long-term observations and modelling results	NIOZ Royal Netherlands Institute for Sea Research	The Netherlands
28	BARINGER M., SMEED D., MOAT B., WILLIS J., LANKHORST M., HOBBS W., DONG S., RAYNER D., JOHNS W., GONI G., VOLKOV D., SEND U.	Atlantic meridional overturning circulation: time series comparison	NOAA Miami	USA
29	GIUDICI A., SOOMERE T., KALDA J.	On stability of the dynamics of pollution patchiness on the sea surface in changing climate conditions	Tallinn University of Technology	EE
30	GOSWAMI V.	High Resolution Satellite Study of Multiple Stressors In Arctic Marine Systems & Correlation of Ocean-atmosphere-cryosphere interactions with Climate Variability To Develop Arctic-Ocean Climate Predicting Models (AOCPM)	Indian Institute of Technology(IIT)	India
31	HADDAD M.	Trends in global and oceanic sea level from satellite altimetry within the framework of Singular Spectrum Analysis	Centre of Space Techniques	France
32	KARROUK M.S.	Ocean-Atmosphere Interaction, New Planetary Energy Balance and their Effects on New Atmospheric Circulation	University Hassan II	
33	MALLIL K., BOSSE A., MARGIRIER F., HOUPERT L., MORTIER L., LOUANCHI F., TESTOR P.	Evolution of water mass characteristics in the Algerian gyres	Laboratoire d'Océanographie et du Climat: Expérimentations et Approches Numériques (LOCEAN)	France
34	MAMNUN N., BRECHINO L., NABI MD. R-U1	Simulation of storm surges in the Bangladesh coast using a one-way ocean-atmospheric coupled modeling system	Institute of Marine Sciences and Fisheries, University of Chittagong	
36	PONSONI L., AGUIAR-GONZÁLEZ B., MAAS L.	Observational study of the western boundary systems of the Southern Indian and Atlantic Oceans: volume transport variability, internal tides and an interocean teleconnection	Georges Lemaître Centre for Earth and Climate Research (TECLIM), Université catholique de Louvain	Belgium
37	SHALTOUT M., OMSTEDT A.	Sea-level change and projected future flooding along the Egyptian Mediterranean coast	Alexandria University	Egypt
39	TOSTE R., DE FREITAS ASSAD L.P., LANDAU L.	Projected changes on the eddy formation in the Southeast Brazilian coast	Laboratory for Computational Methods in Engineering (LAMCE)/COPPE/ UFRJ	Brazil
40	VADSARIA T., RAMSTEIN G., LI L., DUTAY J.-C.	Simulation of the last sapropel event in the Mediterranean Sea: role of the regional precipitation	LSCE	France
41	WOROU K., GOOSSE H., FICHEFET T.	West-African rainfall variability and its link with the Atlantic Ocean variability at different time scales	Université catholique de Louvain	Belgium

Session 4 - Biogeochemical processes

42	BORGES A., CHAMPENOIS W. SCRANTON M.I., STROBBE F., LAGRING R. AND GYPENS N.	Productivity and temperature as drivers of seasonal, spatial and long-term variations of dissolved methane in the Southern Bight of the North Sea	UOC - University of Liège	Belgium
43	BORGES A., VANDENBERGHE T., STROBBE F., LAGRING R.	Ocean acidification in the Belgian coastal zone, a contribution to the BELSPO project "4 decades of Belgian marine monitoring" (4Demon)	UOC - University of Liège	Belgium
44	BOWYER P., GUTKNECHT E., LORENTE P., DABROWSK T., REFFRAY G., SOTILLO M.	Evolution of the CMEMS regional biogeochemical products for the Iberia-Biscay-Ireland zone: The new IBI Multi-Year and short-term operational forecast service	Marine Institute	Ireland
45	DOS SANTOS A., ULSES C., ESTOURNEL C., MARSALEIX P., KESSOURI F.	Understanding the impact of climate change on biogeochemistry and planktonic ecosystems in the Mediterranean Sea.	Laboratoire d'Aérodologie	France
46	EL HOURANY R., ABOUD-ABI SAAB M., FAOUR G., BRAJARD J., CRÉPON M., THIRIA S.	Reconstruction of phytoplankton group variability using diagnostic pigments retrieved from satellite observations	LOCEAN/CNRS	France
47	MAVROPOULOU A.-M., VERVATIS V., NENES A. AND SOFIANOS S.	Interannual to decadal variability of the Oxygen minimum zone in the Mediterranean Sea	National and Kapodistrian University of Athens, Department of Physics	Greece
48	VANDENBULCKE L., CAPET A., GRÉGOIRE M.	Long-term biogeochemical simulation of the Black Sea, and impact of different physics on model performances.	MAST - University of Liège	Belgium
49	ZHU D., ZIRKS E., D. KROM M., N. GOODMAN-TCHERNOV B.	The effect of Nile and natural climate change to the evolving oxygen minimum zone in S-1 sapropel	University of Haifa	Israel

Session 5 - Oceanic climate records (datasets, methods and comparisons)

50	FRIEDMAN A., REVERDIN G., KHODRI M., GASTINEAU G.	Signatures of historical climate variations in a record of Atlantic surface salinity from 1896-2013	University of Edinburgh	United Kingdom
51	BOUTIN J., REUL N. AND THE ESA CCI+SSS CONSORTIUM	Sea Surface Salinity monitoring from Space: the Climate Change Initiative project	LOCEAN/CNRS	France
52	KARSTENSEN J., SEND U., WELLER B., TRULL T., WALLACE D., HARADA N., CRONIN M., KNAP A., LAMPITT R., SNOWDEN D.	The OceanSITES observatory network of fixed open-ocean sustained timeseries	GEOMAR	Germany
53	TOSTE R., STEFONI BÖCK C., DE FREITAS ASSAD L.P., LANDAU L.	Developments on ocean data assimilation system for the South Brazilian Bight	Laboratory for Computational Methods in Engineering (LAMCE)/COPPE/ UFRJ	Brazil
54	WIDERA J., HELZEL T., PETERS H.	Surface current monitoring by Ocean Radar, from experimental to operational stage	Helzel Messtechnik GmbH	Germany
55	DRÉVILLON M., BRICAUD C., DRILLET Y., VON SCHUCKMANN K., GARRIC G., MASINA S., STORTO A., JACKSON L., PETERSON D., DUBOIS C., WOOD R., ZUO H., BALMASEDA M., GUINEHUT S., MULET S., GOURRION J., PARENT L., RÉGNIER C., DESPORTES C.,	The Copernicus Marine Service Global Reanalysis Ensemble Product GREPV1: deriving robustness estimates for ocean variability over the altimetry era.	Mercator	France