

International Sea Level Workshop Final Program

4 - 6 June 2024, Brest, France

Organized by LOPS (Ifremer, CNRS, UBO, IRD)

With support from ISblue and LEFE-GMMC

Day 1 - Tuesday 4 June

09:00 - 09:30 *Coffee & Registration*

09:30 - 09:40 **Introduction to the workshop (William Llovel & Lucia Pineau-Guillou)**

09:40 - 12:10 **SESSION 1: GLOBAL MEAN SEA LEVEL (Chair William Llovel)**

09:40 - 10:00 **Global mean and local sea level budget from updated observations and residuals analysis (SLBC_cci+ project)**

Marie Bouih, Anne Barnoud, Robin Fraudeau, Gilles Larnicol, Anny Cazenave, Benoit Meyssignac, Alejandro Blazquez, Sébastien Fourest, Hugo Lecomte, Lancelot Leclercq, Martin Horwath, Thorben Döhne, Jonathan Bamber, Anrijs Abele, Antonio Bonaduce, Roshin Raj, Jonny Johannessen, Stéphanie Leroux, Nicolas Kolodziejczyk, William Llovel, Kevin Balem, Rémy Asselot, Giorgio Spada, Andrea Storto, Chunxue Yang, Marco Restano, Jérôme Benveniste

10:00 - 10:20 **Argo and Sea level science: Present and Future Challenges**

Virginie Thierry, Susan Wijffels, Nathalie Zilberman & Argo Steering Team

10:20 - 10:40 **New definitions for the high frequency correlated noise in the Global Mean Sea Level uncertainty budget using SWOT Cal/Val phase data**

Victor Quet, Etienne Jussiau, Francesco Nencioli, Pierre Prandi, Gérald Dibarbouré, Benoit Meyssignac, Michaël Ablain

10:40 - 11:10 *Coffee break*

11:10 - 11:30 **Reconstruction of the global thermosteric sea level rise and global ocean heat content with an improved mapping method**

Rémy Asselot, Nicolas Kolodziejczyk, William Llovel, Kevin Balem, Annaïg Prigent-Mazella

11:30 - 11:50 **Revisiting the relation between ocean heat storage and thermal expansion from a water mass perspective**

Robin Waldman, Benoit Meyssignac, Robin Guillaume-Castel, Sébastien Fourest, Karina Von Schuckmann, Jean-Baptiste Sallee

11:50 - 12:10 **Latest improvements in assessing the global Ocean Heat Content and Earth Energy imbalance from space geodetic data**

Robin Fraudeau, Florence Marti, Benoit Meyssignac, Alejandro Blazquez, Sébastien Fourest, Michaël Ablain, Victor Rousseau, Gilles Larnicol, Marco Restano, Roberto Sabia, Gérald Dibarbouré, Jérôme Benveniste

12:10 - 14:00 *Lunch*

14:00 - 14:40 **SESSION 1: GLOBAL MEAN SEA LEVEL (continued) (Chair Antoine Hochet)**

14:00 - 14:20 **Revisiting assumptions of the integrated expansion of heat to improve consistency in ocean heat content estimate**

Sébastien Fourest, Benoit Meyssignac, Michaël Ablain, Florence Marti, Robin Fraudeau, Victor Rousseau

14:20 - 14:40 **Improvements in Estimating 30-Year Mean Sea Level Trends and Acceleration from Global to Regional Scales**

Anna Mangilli, Pierre Prandi, Benoit Meyssignac, Victor Quet, Sébastien Fourest, Franck Octau, Sylvie Labroue, Anne Barnoud, Michaël Ablain, Gerald Debarbouré, Sarah Connors

14:40 - 15:40 **SESSION 2: REGIONAL SEA LEVEL (Chair Rémy Thieblemont)**

14:40 - 15:00 **Impact of Mass Redistribution on Regional Sea Level changes over the South China Sea Shelves**

Svetlana Jevrejeva, B. Thompson, J. Zachariah, D.G. Faller, P. Tkalich

15:00 - 15:20 **Ocean Dynamics' control of the Steric Sea Level Seasonal Cycle**

Antoine Hochet, William Llovel, Thierry Huck, Florian Sévellec

15:20 - 15:40 **Deep steric sea level variability inferred from satellite observations, ocean reanalysis and Deep Argo profiles**

William Llovel, Antoine Hochet, Nathalie Zilberman, Jacob Steinberg

15:40 - 16:10 *Coffee Break*

16:10 - 17:10 SESSION 2: REGIONAL SEA LEVEL (continued) (Chair Jamal Khan)

16:10 - 16:30 2D sea level observations from SWOT

Rosemary Morrow

16:30 - 16:50 Evolution and new challenges for the tides corrections for HR altimetry and SWOT

Loren Carrère, Florent Lyard, Ergane Fouchet, Perrine Abjean*, Mei-Ling Dabat, Michel Tchilibou, Gérald Dibarboure

16:50 - 17:10 Observations of nonlinear internal tide signature in the Maluku Sea with SWOT

Aurelien Ponte, Noé Lahaye, Nicolas Rasclé, Bertrand Chapron, Frederic Nouguier

Day 2 - Wednesday 5 June

09:00 - 10:20 SESSION 2: REGIONAL & COASTAL SEA LEVEL (Chair Svetlana Jevrejeva)

09:00 - 09:20 Downscaled sea-level projections for the North-East Atlantic for climate adaptation services

Maialen Irazoqui, Angélique Melet, Guillaume Reffray, Gonéri Le Cozannet

09:20 - 09:40 Simulated Impact of Time-varying River Runoff and Greenland Freshwater Discharge on Sea Level Variability in the Beaufort Gyre over 2005-2018

Soumaïa Tajouri, William Llovel, Florian Sévellec, Thierry Penduff, Jean Marc Molines, Pierre Mathiot, Thierry Penduff, Stéphanie Leroux

09:40 - 10:00 The active and passive roles of the ocean in generating basin-scale heat content variability

Florian Sévellec, Dafydd Stephenson

10:00 - 10:20 Tidal characteristics of the Ganges–Brahmaputra–Meghna delta. New perspective from in situ observation

Laurent Testut, Fabien Durand, Md. Jamal Uddin Khan, Yann Krien, Zahirul Haque Khan, Saiful Islam, Mélanie Becker, Mikhail Karpytchev, Valérie Ballu, Stéphane Calmant, C.K. Shum

10:20 - 10:50 Coffee Break

10:50 - 12:10 SESSION 3: REGIONAL & COASTAL SEA LEVEL (continued) (Chair Lucia Pineau-Guillou)

10:50 - 11:10 Measuring vertical land motion at the coast & the GNSS component of SONEL (www.sonel.org)

Guy Wöppelmann

11:10 - 11:30 Extended Kalman filtering applied to high-rate GNSS-R sea level measurements in Brest

Aurélien Pira, Alvaro Santamaría-Gómez, Guy Wöppelmann

11:30 - 11:50 Current State of Coastal Subsidence in Europe Derived from the European Ground Motion Service

Rémi Thiéblemont, Gonéri Le Cozannet, Robert J. Nicholls, Jérémy Rohmer, Guy Wöppelmann, Daniel Raucoules, Marcello de Michele, Alexandra Toimil, Daniel Lincke

11:50 - 12:10 Phase-resolved swells across ocean basins in SWOT altimetry data: revealing centimeter-scale wave heights including coastal reflection

Fabrice Ardhuin, Beatriz Molero, Alejandro Bohé, Frédéric Nouguier, Fabrice Collard*, Isabel Houghton

12:10 - 12:30 SESSION 4: EXTREMES & COASTAL FLOODING (Chair Lucia Pineau-Guillou)

12:10 - 12:30 Accounting for eustatic sea level rise in joint analyses of waves and sea levels for the design of maritime structures

Franck Mazas

12:30 - 14:00 Lunch

14:00 - 16:00 SESSION 4: EXTREMES & COASTAL FLOODING (continued) (Chair Rosemary Morrow)

14:00 - 14:20 Physically consistent storylines for UK mean sea-level rise and storm surges with 21st century AMOC decline

Harrison Benjamin, Lesley Allison, Tom Howard, Matt Palmer, Anne Pardaens

14:20 - 14:40 Process-based Projections of Extreme Sea levels along the Indian Ocean Coastlines

Archit Wadalkar, Nidheesh Gangadharan, Abhisek Chatterjee, Sreeraj Puthiyadath, Benjamin Harrison, Siva Srinivas Kolukula, Remya P G

14:40 - 15:00 Extreme sea levels and field campaigns in the North Atlantic

Lucia Pineau-Guillou, Pascal Lazure, Stéphane Leizour

15:00 - 15:20 **Variability of sea level across the Amazon delta: from altimetric tide to the hydrodynamical modeling of the extreme events**

Paul Coulet, Fabien Durand, Laurent Testut, Alice Fassoni-Andrade, Jamal Uddin Khan, Leandro Guedes Santos

15:20 - 15:40 **Regional changes in storm surges along the North Atlantic coasts, since 1850**

Julie Cheynel, Lucia Pineau-Guillou, Pascal Lazure, Marta Marcos, Nicolas Raillard

15:40 - 16:00 **Is the NEMO Ocean General Circulation Model able to simulate extreme sea levels induced by hurricanes?**

Alisée Chaigneau, Melisa Menéndez, Marta Ramírez-Pérez, Alexandra Toimil

16:00 - 16:30 *Coffee Break*

16:30 - 18:00 POSTER SESSION

18:00 - 19:00 *Cocktail*

Day 3 - Thursday 6 June

09:00 - 10:20 SESSION 4: EXTREMES & COASTAL FLOODING (continued) (Chair Julie Cheynel)

09:00 - 09:20 **Sea-level rise scenarios supporting the 3rd national adaptation plan in France**

Gonéri Le Cozannet, Rémi Thiéblemont

09:20 - 09:40 **Chronic flooding events due to sea-level rise in French Guiana**

Rémi Thiéblemont, Gonéri Le Cozannet, Maurizio D'Anna, Déborah Idier, Ali Belmadani, Aimée Slangen, François Longueville

09:40 - 10:00 **Joint Modeling Extremal Sea-Levels Dependency across different French Atlantic Coast Stations**

Nathan Huet, Philippe Naveau

10:00 - 10:20 **Non-stationary GEV models for extreme sea-states in a changing climate**

Nicolas Raillard, Coline Poppeschi

10:20 - 10:50 *Coffee Break*

10:50 - 12:30 SESSION 4: EXTREMES & COASTAL FLOODING (continued) (Chair Gonéri Le Cozannet)

10:50 - 11:10 **Storm surge events associated dynamics and variability in the North Atlantic**

Simon Barbot, Lucia Pineau-Guillou, Jean-Marc Delouis

11:10 - 11:30 **Extreme and mean sea levels in a context of climate change applied to French offshore wind farms**

Coline Poppeschi, Nicolas Raillard, Youen Kervella

11:30 - 11:50 **Storm surges during cyclones over Madagascar: an ocean-wave coupled modeling approach**

Afroosa Malik, Md. Jamal Uddin Khan, Fabien Durand, Paul Coulet, Yann Krien, Xavier Bertin, Laurent Testut

11:50 - 12:10 **Ensemble modelling for surge forecast in southwest France – Contribution of Météo France to the ORACLES project**

Sam Tiéfolo Diabaté, Agbéko Komlan Kpogo-Nuwoklo, Alice Dalphinnet, Denis Paradis, David Ayache, Patrick Ohl, Sophie Lecacheux, Jérémy Rohmer

12:10 - 12:30 **Discussion & Wrap up**

12:30 - 14:00 *Lunch*

14:00 Closing

List of posters

P1 **40-years Storm Surge and Wave high resolution Hindcasts along the Atlantic French coast: Application to extremes events**

Héloïse Michaud, Léo Seyfried, Audrey Pasquet, Fabien Brosse, Leballeur Laurent, Lopez Guiomar, Fabien Leckler, Thomas Faidherbe, Yann Krien, Marc Pezerat

P2 **Eddy variability contribution to decadal regional sea level trends**

Benoît Laurent, Anne-Marie Tréguier, William Llovel, Antoine Hochet

- P3 **TGCAT: A new online tool to inter-compare the content of the main tide gauge data portals**
Laurent Testut, Adrien Laval, Clémence Chupin, Mikael Guichard, Begona Perez-Gomez
- P4 **The French Subantarctic and Antarctic Sea Level Observing Network**
Philippe Téchiné, Laurent Testut*, Antoine Guillot, Michel Calzas, Christine Drezen, Cedric Brachet, Lionel Fichen, Thomas Donal, Tanguy Garmond
- P5 **Sea level rise along the North Atlantic coasts since 1850**
Tino Bellayer, Lucia Pineau-Guillou, William Llovel
- P6 **Effect of Sea State Bias on SWOT measurements**
Samuel Osina, Frédéric Nouguier, Fabrice Ardhuin
- P7 **Reconstructing ocean surface momentum conservation from altimetry, drifters and wind reanalysis**
Margot Demol, Aurélien Ponte, Pierre Garreau
- P8 **Science for the coastal communities facing climate change and sea level rise in the Brittany region**
Anne Marie Treguier, Jean-Pierre Le Bourhis, Philippe Davy, Vincent Dubreuil, Florence Gourlay, Laurent Labeyrie, Marion Lemoine-Schonne, Nicole Roux
- P9 **Sea Level Data Archaeology: from paper archives to scientific applications**
Nathalie Giloy, Inge van den Beld, Salomé Ferré, Titouan Hamon, Alexa Latapy, Yann Ferret, Claire Fraboul, Nicolas Pouvreau
- P10 **Robust acceleration of Earth system heating observed over the past six decades**
Audrey Minière, Karina von Schuckmann, Jean-Baptiste Sallée, Linus Vogt