The 28th Wind waves in the Earth System (WISE) Meeting

29 May - 2 June 2022
Centre Ifremer de Bretagne & île de Batz, France

Agenda

The meeting will be a hybrid event. All lectures will be presented via Zoom (a link and password will be provided before the meeting starts via the WISE e-mail list. Please do not spread the link on social networks in order to avoid zoom bombings). Some lectures may be given by participants attending remotely (marked as "**R**").

There is no charge for remote attendance. All times listed below are in CEST (UTC+2).
All talks are 20' (including questions). Poster format is expected to be A0 (portrait)

Sunday 29 May
17:30 – 20:30
Ice Breaker Reception at Cabaret Restaurant Le Vauban, 17 avenue Clémenceau, Brest:
https://www.cabaretvauban.com/plan-d-acces.html

Monday 30 May
Bus from place de la Liberté leaves at 8:00 from downtown and arrives at 8h30 at Ifremer
The shuttle bus location: In front of the cinema "MULTIPLEX Liberté" nearby BIBUS agency 33 avenue Clémenceau, Brest
https://wise2022.sciencesconf.org/resource/page/id/1

Meeting takes place in the Lucien Laubier auditorium

Monday, May 30th

> **8:45 - 9:00** Welcome & practical information

Fabrice Ardhuin

Wave remote sensing, chair: F. Ardhuin

> **9:00** E. Le Merle, D. Hauser, R. Santoleri, C. Yang

Directional ocean wave spectrum properties from the SWIM instrument under tropical cyclone conditions

> **9:20** F. Collard & G. Guitton

SWIM ocean surface wave spectra L2S product and application to swell tracking

> **9:40** A. Ricondo et al.

CFOSAT-based Swells Forecast System

10:00: Posters flash: F. Ardhuin (Tonga volcano), S. Rikka (SAR spectra), S. Weichert (current shear), T. Vrecica (breaking statistics) , P. Chernyshov (X-band), J. Peach (whitecaps), Benetazzo (extreme values), M. P. Malila (extremes), J. Davis (wave slopes)

10:10 - 11:00 Coffee break & posters

Wave measurements & data assimilation, chair: I. Young

> **11:00** : L. Aouf et al.,

On the assimilation of directional wave observations in coastal area : Analysis during SUMOS field campaign

> **11:20** I. Houghton

Spectral wave data assimilation from a global buoy network

> **11:40** F. Bergamasco

WASSfast: The Next-generation Tool for Real-time Measurements of Ocean Waves' Space-time Fields

Historical wave events, chair: I. Young

- **12:00 A. Dalphinet** et al.

Study of the sea state in western Europe during the historical storm of September 1930

- **12:20** R. **De Plaen** et al.

Validation of vectorized analog seismograms using microseismic ground-motion models

Wave measurements & data assimilation - last talk - , chair: I. Young

- **R**. **12:40** (6:40 AM East Coast) **T. Collins** et al.

Field Testing Miniature Wave Buoys

13:15 - 14:00 Lunch break

Wave - ice interactions chair J.R. Bidlot

- **14:10 A. Babanin** et al.

Wave-Ice-Ocean Interactions: Measurements, Modelling

- **14:30 F. Ardhuin**, F. Collard et al.

Wave attenuation under sea ice in the Arctic: a review of remote sensing capabilities

- **14:50 A. Alberello** & E. Parau

Waves in ice simulations with a dissipative Nonlinear Schrödinger equation

15:10: Posters flash: A. Slunyaev (non-linear waves with ice), V. Alari (Estonia forecasts), J. Thomson (waves far in ice), R. A. Soloviev (spray), B. Vanderplow (surfactants and spray), J. Staneva (coupled wave-atmosphere), F. Ocampo-Torres (in situ air-sea measurements),R.A. Aiyer (LES), L. Paskin (lidar measurements).

15:20 - 16:10 Coffee break & posters

- **R. 16:10 S. Badulin** et al.

Ship-type waves on a floating ice plate

- **16:30 P. Sutherland** & D. Dumont

Wave-driven turbulence and ice formation

And now something completely different …

- **16:50** L. Cavaleri et al.

Sand storms and wind waves

Wind-wave growth , chair L. Lenain

- **R. 17:10 J. Wu** and S. Popinet and L. Deike

Revisiting wind wave growth with fully-coupled direct numerical simulations

- **17:30 M Geva** et al.

Wind waves under steady wind forcing: rigorous modelling vs. experiments

- **17:50 M. A. Erinin** et al.

Speed and Acceleration of Droplets Generated by Breaking Wind Waves

Bus return : 18h15 at Ifremer (19h00 downtown)

Tuesday, May 31 ʳˢᵗ

Bus from place de la Liberté leaves at 8:00 from downtown 8:00
9:15 Roscoff - boat to Ile de Batz

10:00 Welcome

Coupled air-sea modelling, chair : G. Dodet

10:20 J. R. Bidlot & P. A. E. M. Janssen
Wave model driven changes in ECMWF Earth System Model

10:40 N. G. Valiente et al.
Performance of a surface-stress closure scheme in forecasting extreme sea-states

Nearshore dynamics, chair : G. Dodet

11:00 S. Jullien et al.
Spectral wave field transformation from deep waters to the barrier reef front

11:20 C. M. Baker, M. Moulton, M. L Palmsten, K. Brodie, E. Nuss
Deciphering determinants of breaking wave crest length in the surf zone by remotely sensing directional wave fields in the laboratory

12:40 J. Gemmrich et al.
Predicting extreme wave run-up on beaches

12:00 Discussion

12:20 Adjourn. 30' Walk to lunch

13:00 - 14:00 Lunch

14:30 - 16:30 Tour of the island

17:00 : Bus back to Brest … arrives in Brest 18:00

Wednesday, June 1ʳˢᵗ

Bus from place de la Liberté leaves at 8:00 from downtown and arrives at 8h30 at Ifremer

Spectral energy balance, chair: F. Ardhuin

R. 9:00 A. Callaghan
Energy dissipation-based estimates of whitecap coverage and air entrainment rates in whitecaps

9:20 A. Villefer et al.
Wind-wave growth in the presence of swell: from laboratory observations to coastal scale simulations

9:40 Poster flash: M. Alday (source term balance), S. Meenakshi (SAM and Indian waves), K. Christakos (tool for downscaling), F. Barbariol (Mediterranean reanalysis), A. Patra (multi-model ensemble) A. Carrasco (coupling & climate impact), V. Geogjaev (DIA), R. Cao (breaking & bandwidth) F. Leckler (breaking parameterization), S. O. van Vloten (hybrid model), A. Pushkarev (self-similarity and ST6)

10:00 - 11:10 Coffee break

Climate change, chair L Cavaleri (TBC)

11:20 B. Timmermans & C. Gommenginger
Global sea state variability from new multivariate multi-mission satellite altimeter products, reanalyses and wave buoys

11:40 A. Hochet et al.
Influence of anthropogenic climate change in significant wave height trends computed over the satellite era

12:00 I. Young
Will projected changes in global wave climate have significant impacts on our Coastlines?

12:20 A. Meucci & I. Young
Satellite observation-based weighting scheme for CMIP-derived ocean wind-wave climate models

13:00 - 13:40 Lunch break

14:00 H. Tolman
Effects of wind fluctuations on wave growth in WAVEWATCH III[®]

14:20 A. Roland et al.
Improving downscaling efficiency of WAVEWATCH III[®] modelling Framework

14:40 M. Loveland et al.
Stabilized Finite Element Methods for Action Balance Equation

15:00: Posters flash: J. G. Li (multi-grid & SMC), J. Kulin (open boundary conditions), R. Campos (ensemble), A. Abdolali (parameterizations optimization), R. Calvert (surface drift), Z. Zheng (sheared flows), Malila (extremes), P. Pezzuto (finite depth Zakharov equation)

15:10 - 16:00 Coffee break

Wave breaking, chair N. Pizzo

R. 16:00 D. Liberzon et al.
Breaking probabilities in open sea and laboratory wind forced waves

16:20 M. L. McAllister et al.
An Experimental Study of Wave Breaking in Crossing Seas

R. 16 :40 D. Ruth et al.
Entrained bubble dynamics under breaking Wind-waves

17h30: bus leaves Ifremer to Place de la Liberté

19:30 Dinner at 70.8, plateau des Capucins.
https://www.ateliersdescapucins.fr/en/practical-information

Thursday, June 2nd

Bus from place de la Liberté leaves at 8:00 from downtown and arrives at 8h30 at Ifremer

9:00 S. Annenkov & V. Shrira
New wave kinetic equation with the account for finite non-gaussianity

Wave-current interactions, chair Y. Toledo

9:20 N. Pizzo & L. Lenain
The role of Lagrangian drift in the geometry, kinematics and dynamics of surface waves
with application to remote sensing

9:40 L. Lenain, L. Colosi & N. Pizzo
Observations of wave-current interactions from meso- to submesoscales

10:00 V. Shrira R. Almelah & S. Badulin
How does wave field evolution drive surface Currents?

10:20: Posters flash: H. Kalisch (particle motion), E. J. Rainville (micro-SWIFT drifters), H. Michaud (rocky shore), F. Bouchette (edge waves), Y. Li (nonlinear waves over topography), M. Pezerat (cross-shore circulation), L. Cagigal et al. (downscaling), A. Jordi (flood hazards), J. V. Bjorkvist (coastal Norway)

10:30 - 11:20 Coffee break

11:20 G. Hasson, S. Stole-Hentschel, A. Solodoch, Y. Lehan, V. Shrira & Y. Toledo
HF-radar remote sensing of ocean surface current shear using first order Bragg peaks

11:40 B. Smeltzer et al.
Experimental study of wave-turbulence interaction

12:00 T. Halsne et al.
Wave-current interactions in spectral wave models exposed to strong tidal currents: A case study in Northern Norway

R. 12:20 D. Dommermuth
An Overview of the Ocean's Heartbeat

Wave statistics and observations, chair: A. Benetazzo

14:00 S. Knobler, D. Liberzon & F. Fedele
Spatial Temporal Analysis of Water Waves in Eastern Mediterranean Storms

14:20 S. Davison et al.
Space-time statistics of extreme ocean waves in crossing sea conditions during a tropical cyclone

14:40 A. Chabchoub et al.
Extreme wave statistics in the presence of wave reflection

15:00 M. Teles et al.
Modeling the series of intense 2013-2014 winter storms in the Northeastern Atlantic
Ocean, the Bay of Biscay and the Channel, with analysis of the effects related to finite water depth and wave-tide-current interaction

15:20 - 16:20 Coffee break

R. 16:20 V. Grigorieva et al.
Wave spectra partitioning from WW3 and NDBC data in comparison with visual observations

16:40 K. Kumar, S. K. Singh & L. Shemer
Spatial evolution of directional wave spectra in a wind-wave tank

17:00 Meeting closes

17h 45 bus leaves Ifremer to Place de la Liberté

POSTERS

Remote sensing
F. Ardhuin, F. Collard et al.
Sentinel 1A SAR observation of waves with wavelengths up to 1.3 km from the 15 January Tonga volcano explosion
S. Rikka & al.
Transforming SAR Image to Wave Spectra with Deep Artificial Neural Network
S. Weichert, B. K. Smeltzer & S. Å. Ellingsen
How horizontal current shear affects the remote sensing of current depth profiles
T. Vrecica, N. Pizzo & L. Lenain
Observations of wave breaking statistics
Pavel Chernyshov, Ruben Carrasco and Jochen Horstmann
X-band radar sequences-based bathymetry retrieval possibilities in Hofnafjordur tidal inlet area, Iceland
J. Peach et al.
Spatial and temporal tracking of individual whitecaps in digital sea surface images

Wave observations & data assimilation
A. Benetazzo et al.
On the extreme value statistics of spatio-temporal maximum sea waves under cyclone winds
M. P. Malila et al.
Statistical and dynamical properties of verified extreme waves in the North Sea
J. Davis et al.
Wave slopes observed during hurricanes using arrays of drifting buoys

Wave-ice interactions
A. Slunyaev & Y. Stepanyants
Self-modulation of oceanic waves on an ice-covered surface
V. Alari et al.
A 0.5 nmi wave forecast for the Estonian coastal sea: the impact of air-ocean-ice interactions to the wave field evolution
J. Thomson, S. Wahlgren, V. Cooper, S. Brenner, M. Smith, S. Swart, L. Biddle, C. Bitz
Waves observed far (>100 km) within sea ice

Air-sea interactions
A. Soloviev, B. Vanderplow & R. Lukas
Sea Spray Generation Function – ANSYS Fluent Multiphase Solution for Category 1, 3, and 5 Tropical Cyclones
B. Vanderplow et al.
Increased Sea Spray Generation Due to Surfactants: An Insight into Tropical Cyclone Intensity?
J. Staneva & GCOAST Team
GCOAST Model System: coupling of ocean and atmosphere through a dynamic wave Interface
F. Ocampo-Torres et al.
Air-sea interaction study through direct measurements from dedicated field campaigns.
A. Aiyer et al.
A sea surface-based drag model for Large Eddy Simulation of wind-wave interaction
O. Babiker et al.
Identifying and tracking surface-attached vortices in free-surface turbulence from above: a simple computer vision method
L. Paskin et al.
Field measurements of the spectral energy transfer from fast travelling Ocean Waves into the Wind Turbulence in the lower part of the Marine Atmospheric Boundary Layer.
Wave climate
S. Meenakshi et al.
"Footprints of Southern Annular Mode (Sam) on Indian ocean Waves"
Konstantinos Christakos & Jan-Victor Björkqvist
DNORA: an open-access Python package for dynamical downscaling of the panarctic wave hindcast - NORA3.
F. Barbariol et al.
Wind Waves in the Mediterranean Sea: An ERA5 Reanalysis Wind-Based Climatology
A. Carrasco et al.
MakingWaves: Wave-mediated atmosphere-ocean-sea-ice interactions and their climatic impacts in the Nordic Seas and eastern Arctic
A. Patra et al.
Historical Simulation of Global Wave Climate using Anthropogenic and Natural Forcings Derived from Multimodel Ensemble of CMIP6

Parameterizations & energy balance

V. Geogjaev

Some Theoretical Grounds for DIA Method

R. Cao & A. Callaghan

On the influence of spectral bandwidth on properties of laboratory-generated dispersively-focused breaking

F. Leckler et al.

Gaussian-based model for whitecapping: Breaking wave statistics and Dissipation

Alday, M. De Carlo, F. Ardhuin

Source term balance adjustment and wave model validation at global scales

S. O. van Vloten et al.

SHyTCWaves (Stop-motion Hybrid TC-induced Waves): a hybrid model to estimate spatio-temporal fields of directional wave spectra produced by tropical cyclones

A. Pushkarev et al.

On the self-similar alternative to ST6 Source Terms Model

Model numerics

J.-G. Li

Hybrid multi-grid parallelization of WW3 on SMC sub-grids with mixed resolutions

Global wave modelling

R. Campos et al.

Analysis of NCEP's extended wave forecast from the Global Ensemble Forecast System

A. Abdolali et al.

A coherent physics optimization method for the wave models for global to regional scales applications.

Wave-current interactions

R. Calvert et al.

The effects of size, density, and shape on the wave-induced transport of floating marine litter

Z. Zheng, Y. Li & S. Å. Ellingsen

Statistical analysis of weakly nonlinear waves on vertically sheared flows

Nearshore dynamics

H. Kalisch et al.

A wave-by-wave study of particle dynamics in the surf

H. Michaud et al.

Waves transformation and impacts on water level on a rocky shore: the RiCoRé field campaign

F. Bouchette et al.	
Generation and dynamics of trapped edge waves along a gentle rocky slope (Île de Ré, France)	
Y. Li	
Weakly nonlinear surface gravity waves atop a submerged bar and trench: the wave dynamics and kinematics	
M. Pezerat et al.	
Impact of wave energy dissipation on the cross-shore circulation at a dissipative beach under storm wave Conditions	
J. Kulin et al.	
The impact of open wave boundary conditions in fjord and coastal environments	
L. Cagigal & al.	
BINWAVES: A Method to Downscale Wave Spectra to Nearshore Areas	
A. Jordi et al.,	
Comparison of wind wave formulations for assessing coastal flood hazards	
J. V. Bjorkvist et al.	
Simulating waves on an unstructured grid in the complex Norwegian coast	
E. J. Rainville et al.	
Surf-zone measurements with arrays of 'microSWIFT' drifters	
P. Pezzuto	
Class I instabilities in the finite water depth Zakharov equation without surface tension	
Withdrawn:	
N. Violante-Carvalho	
A Linear Inversion Method for retrieval of directional wave spectra from complex SAR look cross spectra	
C. Hegermiller et al.	
Long lead-time swell forecasting initialized with near-source spectral observations	
J. Staneva & B. Jacob	
High-resolution wind wave modelling in complex estuaries	
L. Lavaud et al.	
Wave dissipation across a salt marsh on the French Atlantic coast	
A. Slunyaev	
Spray	