



Maritime Rapid Environmental Assessment Conference
Quantifying, Predicting, Exploiting Uncertainties
in Marine Environments



18 - 22 October 2010
at Villa Marigola, Lerici, Italy

PROGRAMME

<p>Monday 18 Oct</p>	<p>8:00 – 8:30 <i>on-site registration</i></p> <p>8:30 – 12:00 <i>oral session 1</i> QUANTIFY: IN-SITU UNCERTAINTIES</p> <p>12:00 – 13:30 <i>lunch</i></p> <p>13:30 – 17:00 <i>oral session 2</i> QUANTIFY: REMOTE SENSING UNCERTAINTIES</p> <p>17:00 – 19:00 <i>ice-breaker cocktail</i></p>
<p>Tuesday 19 Oct</p>	<p>8:30 – 12:00 <i>oral session 3</i> PREDICT: MODEL UNCERTAINTIES</p> <p>12:00 – 13:30 <i>lunch</i></p> <p>13:30 – 17:00 <i>oral session 4</i> PREDICT: UNCERTAINTY FORECAST</p>
<p>Wednesday 20 Oct</p>	<p>8:30 – 10:30 <i>oral session 5</i> PREPARE: ARCTIC AND CLIMATE SESSION</p> <p>10:30 – 11:30 POSTER SESSION & ARCTIC ROUNDTABLE</p> <p>12:00 – 17:00 <i>boat trip to Portovenere</i></p> <p>19:30 – 23:00 <i>conference dinner</i></p>
<p>Thursday 21 Oct</p>	<p>8:30 – 12:00 <i>oral session 6</i> UNDERSTAND: PROCESS STUDIES</p> <p>12:00 – 13:30 <i>lunch</i></p> <p>13:30 – 17:00 <i>oral session 7</i> UNDERSTAND: UNCERTAINTY TRANSFER</p>
<p>Friday 22 Oct</p>	<p>8:30 – 12:00 <i>oral session 8</i> EXPLOIT: OPERATIONAL EFFECTIVENESS</p> <p>12:00 – 13:30 <i>lunch</i></p> <p>13:30 – 16:30 <i>oral session 9</i> EXPLOIT: ADAPTIVE SAMPLING & DECISION SUPPORT</p>

ORAL SESSIONS

MONDAY 18 OCTOBER 2010 (AM) - QUANTIFY: IN-SITU UNCERTAINTIES

Chair: *Pierre-Marie Poulain (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS))*

[8:30 – 8:45] **Welcome address**

Michel Rixen and NURC management

[8:45 – 9:15] **[KEYNOTE] Uncertainty, Information, Decision**

Edward Gough (Naval Meteorology and Oceanography Command)

[9:15 – 9:30] **Hydrodynamic Design and Optimization of an innovative SWATH-USV by CFD methods**

Stefano Brizzolara (University of Genova - Dept. of Naval Architecture and Marine Technologies)

[9:30 – 9:45] **Slocum Glider: Expanding the Capabilities**

Ben Allsup (Teledyne Webb Research), on behalf of Clayton Jones

[9:45 – 10:00] **REP10A: Lightweight Autonomous Underwater Vehicles (AUV) Performing Coastal Survey Operations to Meet Military Oceanography Requirements**

Michael Incze (Naval Undersea Warfare Center Division Newport)

[10:00 – 10:30] Coffee break

[10:30 – 10:45] **A Concept for Automated Oceanographic Sampling with Autonomous Marine Vehicles**

Donald Eickstedt (Naval Undersea Warfare Center, Division Newport)

[10:45 – 11:00] **Gliders Command and Control Centre**

Daniele Cecchi (NURC)

[11:00 – 11:15] **Glider data processing and data comparison in optical parameter estimation for rapid environmental characterization**

Giuliana Pennucci (NURC)

[11:15 – 11:30] **The Ligurian Dispersion Experiment – LIDEX10**

Pierre-Marie Poulain (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS))

[11:30 – 11:45] **Meteo-marine measuring system in National park Mljet Croatia**

Davor Tomsic (Meteorological and hydrological service Republik of Croatia)

[11:45 – 12:00] **Environmental Observations using Marine Radar Data from a Moving Vessel**

Paul Bell (National Oceanography Centre)

MONDAY 18 OCTOBER 2010 (PM) - QUANTIFY: REMOTE SENSING UNCERTAINTIES

Chair: *Paris Vachon (Defence R&D Canada - Ottawa)*

[13:30 – 14:00] **[KEYNOTE] Space for climate: Overview of ESA Earth Observation Missions & Programme**
Pierre-Philippe Mathieu (ESA)

[14:00 – 14:15] **Sea State Measurement Using Synthetic Aperture Radar Data**
Susanne Lehner (DLR - German Aerospace Center)

[14:15 – 14:30] **Coastal video monitoring system optimization using computational intelligence methods**
Michalis Vourdoukas (University of Algarve)

[14:30 – 14:45] **Sea surface roughness by photogrammetry**
Gaetano Canepa (NURC)

[14:45 – 15:00] **An Inversion Method for Extraction of Low Wind Speed From HF Radar Backscatter**
Wei Shen (University of Hamburg, Institute of Oceanography)

[15:00 – 15:30] Coffee break

[15:30 – 15:45] **Rapid deployment of HF radars with open-mode analysis for near-shore oil spill and search and rescue**
Vicente Fernandez Lopez (Qualitas Remos)

[15:45 – 16:00] **SAR Uncertainty Estimates and its Application to Tropical Cyclone Wind Retrieval**
Silvia Falchetti (ITT Visual Information Solutions)

[16:00 – 16:15] **New RADARSAT Capabilities Improve Maritime Surveillance**
Paris Vachon (Defence R&D Canada - Ottawa)

[16:15 – 16:30] **Reporting on Three Years of Activity on Oil Spill Classification from Optical Satellite Images**
Linda Corucci (University of Pisa)

[16:30 – 16:45] **High resolution coastal ocean winds retrieved from TerraSAR-X**
Donald R. Thompson (Applied Physics Laboratory, John Hopkins University)

[16:45 – 17:00] **Surf Zone Characterization from UAV Imagery**
Rob Holman (COAS, Oregon State University)

[17:00 – 19:00] ICE-BREAKER COCKTAIL

TUESDAY 19 OCTOBER 2010 (AM) - PREDICT: MODEL UNCERTAINTIES

Chair: *Pierre Lermusiaux (MIT)*

[8:30 – 9:00] **[KEYNOTE] Application of an adjoint SWAN wave model**
Richard Allard (Naval Research Laboratory)

[9:00 – 9:30] **[KEYNOTE] Uncertainty Prediction for Ocean Fields**
Pierre Lermusiaux (MIT)

[9:30 – 9:45] **Short Term Forecasting of Sea Surface Temperature Off Canada's East Coast**
Darryl Williams (MetOc Halifax, Department of National Defence, Canada)

[9:45 – 10:00] **Littoral Zone Forecasting: Predicting temporal and spatial variability in nearshore waves and currents on a barred beach with diurnal forcing**
Graham Symonds (CSIRO Centre for Australian Weather and Climate Research)

[10:00 – 10:30] Coffee break

[10:30 – 10:45] **Coastal Rapid Environmental Assessment in The Northern Adriatic Sea**
Simona Simoncelli (INGV Bologna)

[10:45 – 11:00] **Particle Tracking in the German Bight, Comparing Drift Climatologies from Different Numerical Models**
Ulrich Callies (GKSS Research Centre)

[11:00 – 11:15] **Uncertainties in operational drift modelling**
Stephane Law Chune (Mercator-Ocean)

[11:15 – 11:30] **Ocean model validation methods**
Karl Thomas Hjelmervik (Norwegian Defence Research Establishment)

[11:30 – 11:45] **Past and present predictability of severe storms**
Luciana Bertotti (Institute of Marine Sciences - CNR)

[11:45 – 12:00] **Assessment of uncertainty and predictability of wave forecast systems**
Luciana Bertotti (Institute of Marine Sciences - CNR), on behalf of Luigi Cavalieri

TUESDAY 19 OCTOBER 2010 (PM) - PREDICT: UNCERTAINTY FORECAST

Chair: *Yi Chao (Jet Propulsion Laboratory, California Institute of Technology Pasadena)*

[13:30 – 14:00] **[KEYNOTE] A new method for Ocean Ensemble Forecasting with quantification of wind uncertainties**
Srdjan Dobricic (GNOO Bologna), on behalf of Nadia Pinardi

[14:00 – 14:15] **A hybrid background error covariance model for assimilating glider data**
Max Yaremchuk (Naval Research Laboratory)

[14:15 – 14:30] **A review of recent super-ensemble multi-model challenges, developments, results, and perspectives for the coastal ocean**
Michel Rixen (NURC)

[14:30 – 14:45] **Uncertainty forecast by 3-D super-ensemble multi-model fusion in the ocean**
Baptiste Mourre (NURC)

[14:45 – 15:00] **A Regional Ocean Modeling, Data Assimilation and Forecasting System: Anywhere and Anytime**
Yi Chao (Jet Propulsion Laboratory, California Institute of Technology Pasadena)

[15:00 – 15:30] Coffee break

[15:30 – 15:45] **Realtime Forecast System and Adaptive Sampling in Support of REP10**
Germana Peggion (University of New Orleans)

[15:45 – 16:00] **High resolution data assimilation into ocean models through a 4-dimension re-analysis**
Emanuel Coelho (Naval Research Laboratory)

[16:00 – 16:15] **The Predictability of Near-Coastal Environments using Unstructured Grid Models**
Cheryl Ann Blain (Naval Research Laboratory)

[16:15 – 16:30] **Uncertainty quantification in a HYCOM-based Gulf of Mexico simulation using polynomial chaos expansions**
Ashwanth Srinivasan (Rosenstiel School of Marine and Atmospheric Science, Univ. Miami), on behalf of Mohamed Iskandarani

[16:30 – 16:45] **Statistical Distribution Modelling with the Kernel DM+V Algorithm – Application to Oceanographic Data**
Achim Lilienthal (AASS Research Centre, School of Science and Technology)

[16:45 – 17:00] **The NL research programme (2009-2012) for military oceanography**
Frans-Peter Lam (TNO Defence, Security and Safety , Observation Systems)

WEDNESDAY 20 OCTOBER 2010 (AM) - PREPARE: ARCTIC AND CLIMATE SESSION

Chair: *Tom Curtin (NURC)*

[8:30 – 8:45] **Session introduction**
Tom Curtin (NURC)

[8:45 – 9:15] **[KEYNOTE] U.S. Navy's Arctic Forecast Systems**
Pamela Posey (Naval Research Laboratory)

[9:15 – 9:30] **Uncertainty estimates in the joint NSIDC and EUMETSAT sea ice re-analysis**
Rasmus Tonboe (Danish Meteorological Institute)

[9:30 – 9:45] **Simulation of the sea ice brightness temperature variability at L-band**
Rasmus Tonboe (Danish Meteorological Institute)

[9:45 – 10:00] **The use of AUVs to map the variability of under-ice topography**
Peter Wadhams (Dept of Applied Maths & Theoretical Physics, University of Cambridge)

[10:00 – 10:15] **Terrain Navigation for Underwater Autonomous Gliders**
Raffaele Grasso (NURC), on behalf of Julien Lagadec

[10:15 – 10:30] **Interannual variability in the North Atlantic: intercomparison between observations, hindcasts and reanalyses**
Albanne Lecointre (INRIALPES)

[10:30 – 11:00] Coffee break

[10:30 – 11:30] – POSTER SESSION

[10:30 – 11:30] – ARCTIC ROUND TABLE (moderator: Tom Curtin)

[12:00 – 17:00] – BOAT TRIP TO PORTOVENERE

[19:30 – 23:00] – CONFERENCE DINNER AT VILLA MARIGOLA

THURSDAY 21 OCTOBER 2010 (AM) - UNDERSTAND: PROCESS STUDIES

Chair: *Alfred R. Osborne (Physics Department, University of Turin)*

- [8:30 – 9:00] **[KEYNOTE] Coupled Ocean-Atmosphere Ensemble Prediction**
James Cummings (Naval Research Laboratory), on behalf of Teddy Holt
- [9:00 – 9:15] **Numerical modeling of the surface circulation in the Sea of Marmara during the TSS experiment**
Jacopo Chiggiato (NURC)
- [9:15 – 9:30] **Ocean-atmosphere wave coupling: extreme event analysis, forecast and effects in the Mediterranean Sea in May 2010**
Jacopo Chiggiato (NURC), on behalf of Lionel Renault (SOCIB)
- [9:30 – 9:45] **Backtracking drifting objects using a forward algorithm on a stochastic trajectory model**
Oyvind Brevik (The Norwegian Meteorological Institute)
- [9:45 – 10:00] **Buoy Tracking Using Monte-Carlo Techniques**
Patrick Hogan (Naval Research laboratory)
- [10:00 – 10:30] Coffee break
- [10:30 – 10:45] **A finite element sea ice model of the Canadian Arctic Archipelago**
Julie D. Pietrzak (Delft University of Technology)
- [10:45 – 11:00] **A Study Of The Warm Core Cyprus Eddy With Ocean Gliders And Data Assimilation**
Daniel Hayes (Oceanography Center, University of Cyprus, Nicosia, Cyprus)
- [11:00 – 11:15] **Relative dispersion in the Liguro-Provencal basin: from submesoscale to mesoscale**
Katrin Schroeder (CNR-ISMAR)
- [11:15 – 11:30] **Observation of Strong Current Events in a Time Series of approximately Eleven Years Conducted at the Baltic Coast off the Rerik Sea Resort, and their Impact on the Uncertainties of Surf and Coastal Current Forecasts**
Uwe Paul (German Naval Office)
- [11:30 – 11:45] **Observational and modeling case study of an extreme atmospheric forced event in the Turkish Straits on Nov. 22, 2008**
Jeffrey W. Book (U.S. Naval Research Laboratory)
- [11:45 – 12:00] **Uncertainty in Internal Wave Fields: Coherent Structures and Nonlinear Waves**
Alfred R. Osborne (Physics Department, University of Turin)

THURSDAY 21 OCTOBER 2010 (PM) - UNDERSTAND: UNCERTAINTY TRANSFER

Chair: *Steven Finette (Naval Research Laboratory)*

[13:30 – 14:00] **[KEYNOTE] Sensitivity of acoustic propagation to uncertainties in the marine environment as characterized by various Rapid Environmental Assessment methods**

Sean Pecknold (DRDC Atlantic)

[14:00 – 14:15] **Quantification of environmental uncertainty and its effect on acoustic propagation**

Steven Finette (Naval Research Laboratory)

[14:15 – 14:30] **Transferring oceanographic to acoustic uncertainty using polynomial chaos expansions**

Kevin LePage (NURC)

[14:30 – 14:45] **Finding acoustically stable areas through EOF classification**

Karl Thomas Hjelmervik (Norwegian Defence Research Establishment)

[14:45 – 15:00] **Bathymetry Estimation from Multi-Spectral Satellite Images Using a Neuro-Fuzzy Technique**

Linda Corucci (University of Pisa)

[15:00 – 15:30] Coffee break

[15:30 – 15:45] **A multispectral electromagnetic footprint method for determining sediment conductivity profiles**

Lisa Rosenqvist (Swedish Research Defence Agency)

[15:45 – 16:00] **Uncertainties in internal solitary wave modeling due to parameter variability**

Alex Warn-Varnas (Naval Research Laboratory)

[16:00 – 16:15] **Chronic Oil Pollution in the North Sea: a Drift Climatology Represented by a Bayesian Network**

Ulrich Callies (GKSS Research Centre)

[16:15 – 16:30] **Predicted and Observed Variability in Sound Speed in the Oceanic Littoral**

Richard Thain (University of Plymouth)

[16:30 – 16:45] **A Comparative Analysis of Various Data Sources for Use in Anti-Submarine Warfare Operations**

Erik Kvaleberg (NORNAVTRAINEST / METOC)

FRIDAY 22 OCTOBER 2010 (AM) - EXPLOIT: OPERATIONAL EFFECTIVENESS

Chair: *John Osler (DRDC Atlantic)*

[8:30 – 8:45] **Experimental Results Using Forward-Looking Multistatic Transmitter Sonar to Achieve Super Resolution**

Elena Gaudette (Naval Undersea Warfare Center)

[8:45 – 9:00] **An autonomous underwater vehicle for seabed characterization**

Peter Nielsen (NURC)

[9:00 – 9:15] **An approximate relationship between water depth and geoacoustic properties for application in sonar performance prediction in uncertain environments**

John Osler (DRDC Atlantic)

[9:15 – 9:30] **Methodology and Architecture for Using Oceanographic and Meteorological Ensembles to Improve Forecast Skill and Guidance in Support of Tactical Planning and Operations**

John Cook (Naval Research Laboratory), on behalf of James Etro

[9:30 – 9:45] **Dynamically coupling INTEL and METOC to predict the risk of pirate attack**

Ted Tsui (Naval Research Laboratory, Monterey), on behalf of James Hansen

[9:45 – 10:00] **The NURC OpenSea Development platform**

Michel Leonard (NURC)

[10:00 – 10:30] Coffee break

[10:30 – 10:45] **Analysis of Active Sonar Waveform Design by Echolocating Mammals**

John DiCecco (Naval Undersea Warfare Center)

[10:45 – 11:00] **The impact of variable shallow water environment on source localization uncertainty**

Yong-Min Jiang (NURC)

[11:00 – 11:15] **Accounting for Spatiotemporal Variability in Shallow-Water Waveguides for Prediction and Inversion**

Kyle M Becker (NURC)

[11:15 – 11:30] **Adaptive selection of the background estimation procedure for target detection IR systems in naval surveillance applications**

Alessandro Rossi (Dipartimento di Ingegneria dell'Informazione - Università di Pisa)

[11:30 – 11:45] **Inversion for water column and sediment sound speed profiles in range-dependent environments with application to data from the SW06 Experiment**

Megan Ballard (Applied Research Laboratories at the University of Texas)

[11:45 – 12:00] **Transitioning the Multistatic Tactical Planning Aid (MSTPA) towards decision support software**

Christopher Strode (NURC)

FRIDAY 22 OCTOBER 2010 (PM) - EXPLOIT: ADAPTIVE SAMPLING & DECISION SUPPORT

Chair: *Ted Tsui (Naval Research Laboratory, Monterey)*

[13:30 – 14:00] **[KEYNOTE] Cooperative distributed localization and environmental sampling by AUV teams**

Andrea Caiti (ISME / DSEA, University of Pisa)

[14:00 – 14:30] **[KEYNOTE] Optimal Glider Sample Strategies for Uncertainty Reduction**

Kevin Heaney (OASIS Inc.)

[14:30– 14:45] **Optimum mission planning for a network of gliders**

Alberto Alvarez (NURC)

[14:45 – 15:00] **State-of-the-art of DSSs at NURC and future trends**

Marco Cococcioni (NURC)

[15:00 – 15:30] Coffee break

[15:30 – 15:45] **Decision Support during REP10**

Raffele Grasso (NURC)

[15:45 – 16:15] **[KEYNOTE] Decision Making under Conditions of Uncertainty: The Impact of Uncertainty on Operator Performance**

Yvonne Masakowski (Naval Undersea Warfare Center)

[16:15 – 16:30] **Poster and oral awards**

Conference closing

POSTERS

(on show during coffee breaks and lunch time from 18 to 22 October,
specific poster session on Wed. 20 Oct. AM)

- 1- **A discussion of the use of statistical classification methods to identify SST signatures in SAR imagery**
Darryl Williams (MetOc Halifax, Department of National Defence, Canada)
- 2- **Interactive artificial intelligence based spatial predictive modeling of rare plant species occurrences**
Denis Garagic (BAE Systems)
- 3- **Simulation of the satellite radar altimeter Arctic sea ice thickness retrieval uncertainty**
Rasmus Tonboe (Danish Meteorological Institute)
- 4- **Features of Monthly and Seasonal Temperature Ensemble Forecasts for the Baltic Sea**
Petra Roiha (Finnish Meteorological Institut)
- 5- **Thermal RECharging (TREC) Profiling Float Powered by Ocean Thermal Energy**
Yi Chao (Jet Propulsion Laboratory, California Institute of Technology Pasadena)
- 6- **Dispersion prediction uncertainty**
Anne Molcard (LSEET Univ. Toulon)
- 7- **Surface current map reconstruction from a single coastal radar-site**
Julien Marmain (LSEET Univ. Toulon)
- 8- **Intelligent Sampling for Ocean Fields**
Pierre Lermusiaux (MIT)
- 9- **Interaction between currents, meteorological and topographic forcings; the case study of Portofino Promontory (northern Ligurian shelf) in summer 2004**
Marina Locritani (National Institute of Geophysics and Vulcanology, Genova University)
- 10- **A summary of the COASTALT project and its contribution to the monitoring of coastal sea level**
Paolo Cipollini (National Oceanography Centre, Southampton)
- 11- **Slocum Glider performance with 2Hz optical instruments in Eastsound, WA USA**
Andrew Quaid (Naval Research Laboratory)
- 12- **Boundary condition uncertainty in the NRL relocatable ocean ensemble forecast system**
Clark Rowley (Naval Research Laboratory)
- 13- **GIS Tools for Ocean and Weather Analysis and Model Performance**
Richard Allard (Naval Research Laboratory), on behalf of James Dykes

POSTERS cont'd

- 14- **Maritime Decision Support Systems Validation Involving METOC Officers During REP10 Cruise**
Raffaele Grasso (NURC)
- 15- **Gliders Command and Control Centre**
Daniele Cecchi (NURC)
- 16- **NURCs Unique CTD and Oceanographic Calibration Facility**
Domenico Galletti (NURC)
- 17- **Self Organizing Networks of Gliders for Adaptive Sampling of the Ocean**
Marco Cococcioni (NURC)
- 18- **Sonar performance prediction from glider measurements using the Multistatic Tactical Planning Aid (MSTPA)**
Christopher Strobe (NURC)
- 19- **Recent technological advances at NURC: Optical instrument packages, Optical data acquisition accuracy and Optical sensor calibration**
Marina Ampolo Rella (NURC)
- 20- **Improved heat fluxes in ocean circulation models by optics**
Violeta Sanjuan Calzado (NURC)
- 21- **Glider observations of an abrupt mixing event in the upper ocean**
Simon Ruiz (IMEDEA (CSIC-UIB))
- 22- **Surface drifter measurements during TSS project (Aegean, Marmara and Black Seas)**
Riccardo Gerin (OGS)
- 23- **Multi-Cast Measurement Protocols for Improving Near Surface Radiometric Data**
Charles Trees (NURC)
- 24- **Integrated monitoring of coastal waters in the Ligurian and North Tyrrhenian seas: comparison of empirical and semi-analytical chlorophyll regional algorithms in MOMAR**
Chiara Lapucci (CNR Ibimet / LAMMA)