

# **IMEKO TC19 Workshop on Metrology for the Sea (MetroSea 2017)**

Learning to measure sea health  
parameters

Naples, Italy  
11 - 13 October 2017

ISBN: 978-1-5108-5211-2

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2017) by the International Measurement Confederation (IMEKO)  
All rights reserved.

Printed by Curran Associates, Inc. (2018)

For permission requests, please contact the International Measurement Confederation (IMEKO)  
at the address below.

IMEKO Secretariat  
Dalszinhaz utca 10, 1st floor, Office room No. 3  
H-1061 Budapest (6th district)  
Hungary

Phone/Fax: +36 1 353 1562

imeko@t-online.hu

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: curran@proceedings.com  
Web: www.proceedings.com

# TABLE OF CONTENTS

<b>COMPARISON BETWEEN IMAGE ANALYSIS TECHNIQUES FOR BOAT SHAPE MEASUREMENTS</b> .....	1
<i>Sofia Catalucci, Roberto Marsili, Michele Moretti, Gianluca Rossi</i>	
<b>A HIGH ACCURACY ATTITUDE SYSTEM FOR A TAILLESS UNDERWATER GLIDER</b> .....	7
<i>Enrico Petritoli, Fabio Leccese</i>	
<b>SEASONAL CHANGES IN COASTAL FISH ASSEMBLAGES BY MULTIPARAMETRIC VIDEO-OBSERVATORY MONITORING</b> .....	13
<i>E. Fanelli, V. Sbragaglia, E. Azzurro, S. Marini, J. Del Rio, D. Toma, J. Aguzzi</i>	
<b>INTER-COMPARISON OF HF RADAR WAVE MEASUREMENTS IN THE MALTA-SICILY CHANNEL</b> .....	17
<i>A. Orasi, M. Picone, A. Drago, F. Capodici, A. Gaucci, G. Nardone, R. Inghilesi, J. Azzopardi, A. Galea, G. Ciraolo</i>	
<b>THE ITALIAN FIXED-POINT OBSERVATORY NETWORK FOR MARINE ENVIRONMENTAL MONITORING – IFON</b> .....	22
<i>M. Ravaioli, C. Bergami, F. Riminucci, S. Aracri, S. Aliani, M. Bastianini, A. Bergamasco, C. Bommarito, M. Borghini, R. Bozzano, F. Brunetti, C. Cantoni, E. Caterini, V. Cardin, C. Cesarini, R. R. Colucci, E. Crisafi, A. Crise, R. D'Adamo, A.G. Di Sarra, C. Fanara, A. Giorgetti, F. Grilli, L. Langone, M. Lipizer, M. Marini, S. Menegon, T. Minuzzo, S. Miserocchi, E. Partescano, E. Paschini, F. Pavesi, P. Penna, S. Pensieri, A. Pugnetti, F. Raicich, A. Sarretta, K. Schroeder, T. Scirocco, A. Specchiulli, G. Stanghellini, A. Vetrano</i>	
<b>UNDERWATER ACOUSTIC CALIBRATION STANDARDS FOR FREQUENCIES BELOW 1 KHZ: CURRENT STATUS OF EMPIR "UNAC-LOW" PROJECT</b> .....	28
<i>S. Buogo, S. Mauro, J.F. Borsani, S. Curcuruto, A. Biber, A.C. Çorakçi, A. Golick, S. Robinson, G. Hayman, S. Barrera-Figueroa, M. Linné, P. Sigray, P. Davidsson</i>	
<b>SEA SURFACE TEMPERATURE MONITORING IN ITALIAN SEAS: ANALYSIS OF LONG-TERM TRENDS AND SHORT-TERM DYNAMICS</b> .....	34
<i>M. Picone, A. Orasi, G. Nardone</i>	
<b>AN AUTONOMOUS IMAGING SYSTEM FOR ARGO FLOATS</b> .....	39
<i>Simone Marini, Lorenzo Corgnati, Carlo Mantovani, Mauro Bastianini, Ennio Ottaviani, Emanuela Fanelli, Jacopo Aguzzi, Annalisa Griffa, Pierre Marie Poulain</i>	
<b>ISME TRENDS: AUTONOMOUS SURFACE AND UNDERWATER VEHICLES FOR GEOSEISMIC SURVEY</b> .....	44
<i>Gianluca Antonelli, Filippo Arrichiello, Andrea Caiti, Giuseppe Casalino, Giovanni Indiveri, Lorenzo Pollini, Enrico Simetti</i>	
<b>REAL-TIME MICROBIAL CONCENTRATIONS BY AUTOMATED ON-LINE FLOW CYTOMETRY FOR MARINE COASTAL MONITORING</b> .....	50
<i>Casotti Raffaella, Balestra Cecilia, Van Dijk Mark, Passarelli Augusto, Sigrist Jürg, Hammes Frederik</i>	
<b>PHYTOPLANKTON DYNAMICS BY AUTONOMOUS HIGHFREQUENCY FLOW CYTOMETRY FROM A FLOATING BUOY IN THE GULF OF NAPLES</b> .....	54
<i>Mark.A. van Dijk, Augusto Passarelli, Fabio Conversano, Raffaella Casotti</i>	
<b>A NEW AUTOMATED FLOW CYTOMETER FOR HIGH FREQUENCY IN SITU CHARACTERISATION OF HETEROTROPHIC MICROORGANISMS AND THEIR DYNAMICS IN AQUATIC ECOSYSTEMS</b> .....	58
<i>Tina Silovic, Gérald Grégori, Mathilde Dugenne, Melilotus Thyssen, François Calendreau, Thibaut Cossart, Harrie Kools, George Dubelaar, Michel Denis</i>	
<b>EVALUATION AND COMPARISON OF NON-CONTACT MEASUREMENT TECHNIQUES FOR THE OBSERVATION AND SHAPE RECONSTRUCTION OF SESSILE BENTHIC ORGANISMS</b> .....	62
<i>Rachele Napolitano, Massimiliano Guarneri, Maria Cristina Gambi, Enrico Primo Tomasini</i>	
<b>PROCEDURES AND TECHNOLOGIES FOR 3D RECONSTRUCTION WITH DIVERS OF UNDERWATER ARCHAEOLOGICAL SITES AND MARINE PROTECTED AREAS</b> .....	68
<i>Luca Panebianco, Silvia Zingaretti, Nicolò Ciuccoli, Corentin Altepe, S. Murat Egi, Fiorenza Micheli, David Scaradozzi</i>	
<b>DEVELOPMENT OF A LASER-SCANNING DEVICE FOR THE SURVEY OF WIDE SUBMERGED ARCHAEOLOGICAL AREAS</b> .....	74
<i>Barbara Davide Petriaggi, Gabriele Gomez de Ayala</i>	
<b>OBSEA, A MARINE SENSOR TESTING SITE FOR METROLOGY</b> .....	78
<i>Matias Carandell Widmer, Albert Garcia-Benadí, Joaquín del Río Fernandez</i>	
<b>VESSEL ATTITUDE ESTIMATION BY CAMERA SENSORS</b> .....	83
<i>S. Del Pizzo, S. Gaglione, A. Angrisano, G. Salvi, S. Troisi</i>	

<b>ENHANCED PSEUDORANGE WEIGHTING SCHEME USING LOCAL REDUNDANCY .....</b>	<b>89</b>
<i>Antonio Angrisano, Silvio Del Pizzo, Salvatore Gaglione, Salvatore Troisi, Mario Vultaggio</i>	
<b>GATHERING DIFFERENT MARINE GEOLOGY DATA (SEISMICS, ACOUSTICS, SEDIMENTOLOGICAL) TO INVESTIGATE ACTIVE FLUID SEEPAGE (AFS) IN THE SOUTHERN REGION OF THE CENTRAL MEDITERRANEAN SEA .....</b>	<b>95</b>
<i>Daniele Spatola, Aaron Micallef, Attilio Sulli, Luca Basilone, Gualtiero Basilone</i>	
<b>MEASURING GROWTH STRUCTURE OF REEF FRAMEWORKS IN MEDITERRANEAN DEEP-WATER CORAL-TOPPED MOUNDS .....</b>	<b>101</b>
<i>Alessandra Savini, Marco Taviani, Fabio Marchese, Agostina Vertino, Cesare Corselli, Marie-Claire Fabri, Andrè Freiwald, Jozée Sarrazin</i>	
<b>SIGNAL DENOISING USING THE STATIONARY WAVELET DECOMPOSITION .....</b>	<b>104</b>
<i>Eleonora Stefanutti, Fabio Bruni</i>	
<b>MORPHO-SEDIMENTARY SETTING AND EVOLUTION OF MARETTIMO VALLEY (EGADI ISLANDS, SICILY) DURING MIDDLE-LATE QUATERNARY: INTERACTION BETWEEN SEA LEVEL CHANGES AND OCEANOGRAPHIC CIRCULATION .....</b>	<b>111</b>
<i>M. Agate, S. Tamburrino, A. Sulli, F. Placenti, M. Sprovieri, C. Lo Iacono, S. Passaro</i>	
<b>PRECISION, ACCURACY AND SOURCES OF ERRORS IN MULTIBEAM DATA ACQUISITION AND PROCESSING FOR A CORRECT INTERPRETATION OF THE BACKSCATTER DATA (BOTH FROM SEAFLOOR AND WATER COLUMN).....</b>	<b>117</b>
<i>Sara Innangi, Renato Tonielli</i>	
<b>MULTI-PARAMETRIC SENSOR NETWORK FOR WATER QUALITY MONITORING .....</b>	<b>123</b>
<i>Ján Šaliga, Dušan Kocur, Pavol Galajda, Miloš Drutarovský, Ľudmila Maceková, Imrich Andráš, Linus Michaeli</i>	
<b>A HIGH ACCURACY NAVIGATION SYSTEM FOR A TAILLESS UNDERWATER GLIDER .....</b>	<b>127</b>
<i>Enrico Petritoli, Fabio Leccese</i>	
<b>MORPHOMETRIC MEASURES TO ASSESS THE MATURITY OF THE SUBMERGED DRAINAGE BASINS. THE CASE OF THE TARANTO CANYON UPPER REACH .....</b>	<b>133</b>
<i>A. Meo, F. L. Chiocci, M. R. Senatore</i>	
<b>MORPHOLOGICAL AND MORFOMETRIC ANALYSIS OF BED FORMS IN THE BONIFACIO CHANNEL (MEDITERRANEAN OCCIDENTAL).....</b>	<b>138</b>
<i>G. Deiana, A. Meleddu, P. E. Orrù</i>	
<b>MONITORING SYSTEM FOR THE SEA: ANALYSIS OF METEO, WAVE AND CURRENT DATA.....</b>	<b>143</b>
<i>Elvira Armenio, Diana De Padova, Francesca De Serio, Michele Mossa</i>	
<b>HIGH RESOLUTION WITH SMALL BUDGET: THE “GEODIVE” METHOD FOR DETAILED 3D RECONSTRUCTION OF SUBMERGED MORPHOLOGIES AND RELATED MEASUREMENTS.....</b>	<b>150</b>
<i>Giovanni Gaglianone, Jacopo Crognale, Carlo Esposito</i>	
<b>INSTRUMENTATION AND GEOTECHNICAL MEASUREMENTS ON SUBMARINE CONTAMINATED SEDIMENTS .....</b>	<b>158</b>
<i>Francesco Adamo, Gregorio Andria, Federica Cotecchia, Attilio Di Nisio, Anna Maria Lucia Lanzolla, Daniela Miccoli, Francesca Sollecito, Maurizio Spadavecchia, Francesco Todaro, Claudia Vitone</i>	
<b>EXPLORING AND MONITORING DEEP-SEA USING UNDERWATER VIDEO SYSTEMS.....</b>	<b>162</b>
<i>Gianfranco D’Onghia, Francesca Capezzuto, Roberto Carlucci, Angela Carluccio, Porzia Maiorano, Michele Panza, Pasquale Ricci, Letizia Sion, Angelo Tursi</i>	
<b>RELIABLE HIGH RESOLUTION PHYSICAL PROPERTIES CORRELATION IN SEDIMENTS AS A POWERFUL TOOL FOR GEOLOGICAL EXPLOITATION AND NATURAL HAZAR ISSUES .....</b>	<b>167</b>
<i>Marina Iorio, Antimo Angelino, Francesca Budillon, Donatella D. Insinga, Agostino Meo, Maria Rosaria Senatore</i>	
<b>GRAIN SIZE DATA ANALYSIS OF MARINE SEDIMENTS, FROM SAMPLING TO MEASURING AND CLASSIFYING. A CRITICAL REVIEW.....</b>	<b>173</b>
<i>Elena Romano, Maria Celia Magno, Luisa Bergamin</i>	
<b>DIELECTRIC CONSTANT DETERMINATION USING BISTATIC GROUND-PENETRATING RADAR: A CASE STUDY AT THE COLOMBAIA MARINE ARCHEOLOGICAL AREA, TRAPANI, ITALY .....</b>	<b>179</b>
<i>V. Di Fiore, E. Coppola, G. Cavuoto, N. Pelosi, M. Punzo, D. Tarallo, G. Tranchida</i>	
<b>PREDICTABILITY OF SEA WAVE ANOMALOUS (MICROTSUNAMIS MODELING) BY SUBMARINE LANDSLIDES APPLIED TO CIRÒ MARINA COAST ALONG THE CALABRO IONIAN MARGIN .....</b>	<b>183</b>
<i>V. Di Fiore, L. Amato, G. Cavuoto, E. Marsella, M. Punzo, D. Tarallo</i>	

<b>APPLICATION OF X-BAND WAVE RADAR FOR COASTAL DYNAMIC ANALYSIS: CASE TEST OF BAGNARA CALABRA (SOUTH TYRRHENIAN SEA, ITALY)</b> .....	186
<i>Michele Punzo, Giuseppe Cavuoto, Vincenzo Di Fiore, Daniela Tarallo, Giovanni Ludeno, Rosanna De Rosa, Giuseppe Cianflone, Rocco Dominici, Michele Iavarone, Fabrizio Lirer, Nicola Pelosi, Laura Giordano, Antonio Natale, Ennio Marsella</i>	
<b>CARBON DIOXIDE DETERMINATION IN ATMOSPHERE AND SEAWATER: APPROACHES FOR THE COMPARABILITY OF MEASUREMENT RESULTS</b> .....	192
<i>Francesca Rolle, Michela Segà</i>	
<b>UNCERTAINTY EVALUATION OF CTD MEASUREMENTS: A METROLOGICAL APPROACH TO WATER-COLUMN COASTAL PARAMETERS IN THE GULF OF LA SPEZIA AREA</b> .....	196
<i>G. Raiteri, A. Bordone, T. Ciuffardi, F. Pennecchi</i>	
<b>COMPARISON OF GRAVITY AND VIBRO CORER FOR ACQUISITION OF ENVIRONMENTAL DATA IN HIGHLY IMPACTED AREAS. THE CASE OF AUGUSTA HARBOR (EASTERN SICILY, ITALY)</b> .....	202
<i>Elena Romano, Luisa Bergamin, Maria Celia Magno, Antonella Ausili</i>	
<b>INTEGRATED GEOPHYSICAL TECHNIQUES TO IMAGE SHORT TO VERY SHORT-TERM GROUND DEFORMATION ASSOCIATED WITH UNREST AT COASTAL CALDERAS: A CASE STUDY FROM THE POZZUOLI BAY, CAMPI FLEGREI, SOUTH ITALY</b> .....	206
<i>M. Sacchi, F. Matano, S. Passaro</i>	
<b>GRAIN SIZE ANALYSIS: A COMPARISON BETWEEN LASER GRANULOMETER AND SEDIGRAPH</b> .....	210
<i>Maria Celia Magno, Francesco Venti, Giovanni Gaglianone, Giancarlo Pierfranceschi, Elena Romano</i>	
<b>VERIFICATION OF THE METROLOGICAL RELIABILITY OF STANDARD SEAWATER CALIBRATION</b> .....	215
<i>Steffen Seitz</i>	
<b>TRACEABILITY OF PH<sub>T</sub> VALUES OF EQUIMOLAL TRIS BUFFERED ARTIFICIAL SEAWATER SOLUTIONS IN BRACKISH WATERS</b> .....	223
<i>Frank Bastkowski, Beatrice Sander, Steffen Seitz, Jens Daniel Müller</i>	
<b>TRACEABLE SEA TEMPERATURE MEASUREMENTS PERFORMED BY OPTICAL FIBERS</b> .....	227
<i>C. García Izquierdo, A. Garcia-Benadi, P. Corredera, D. del Campo, S. Hernandez, J. del Río Fernandez, M. Nogueres-Cervera, C. Pulido de Torres</i>	
<b>REPEATED BATHYMETRIC SURVEYS AS A FUNDAMENTAL TOOL TO MEASURE RAPID SEAFLOOR VARIATIONS IN GEOLOGICALLY-ACTIVE AREAS: EXAMPLES FROM SOUTHERN ITALIAN COASTLINES</b> .....	233
<i>Daniele Casalbore</i>	
<b>ON THE USE OF MORPHOMETRIC INDICATORS TO IMPROVE AND SIMPLIFY THE INTERPRETATION OF MULTIBEAM SWATH BATHYMETRIC DATA: CASE STUDIES FROM VOLCANIC AND NON-VOLCANIC SETTINGS</b> .....	238
<i>S. Passaro, G. Ventura</i>	
<b>A TOOL FOR A FAST, SEMI-AUTOMATIC CLEANING OF MULTIBEAM SWATH BATHYMETRIC RECORDS FROM SPIKES</b> .....	242
<i>Passaro S.</i>	
<b>THE SEAFLOOR GEOMORPHOLOGY OF BOKA KOTORSKA BAY</b> .....	246
<i>Giovanni Bortoluzzi, Federico Giglio, Marco Ligi, Fabrizio Del Bianco, Valentina Ferrante, Luca Gasperini, Mariangela Ravaioli</i>	
<b>USING GEOMORPHOMETRIC TECHNIQUES TO ASSESS SPATIAL DISTRIBUTION AND VOLUME OF CORALLIGENOUS BIOCONSTRUCTIONS (MEDITERRANEAN SEA)</b> .....	252
<i>Fabio Marchese, Valentina Alice Bracchi, Daniela Basso, Cesare Corselli, Alessandra Savini</i>	
<b>Author Index</b>	