

WORKSHOP ON PHYSICAL PROCESSES IN NATURAL WATERS GIRONA-2001

Chairman: Xavier. Casamitjana (UdG- Catalonia-Spain)

Workshop Committee: L. Bengtsson (LU, Sweden), E. Bäuerle (LIUK, Germany), B. Boehrer (UFZ, Germany) J. Fernando (ASU, U.S.A.) J. Imberger (CWR, Australia), Geoffrey Schladow (UCD, U.S.A.), A. Stips (JRC, Italy), R. Uittenbogaard (DH, Netherlands), A. Wüest (EAWAG, Switzerland), Madis Lilover (EMI, Estonia)

Organizing Committee: J. Colomer, J. Pérez, E. Roget, T. Serra

Editor's Preface

The workshop "*Physical Processes in Natural Waters*" is the continuation of the series of workshops on this topic, held annually for the last five years in Kastanienbaum (CH, 1996); Ispra (I, 1997); Magdeburg (D, 1998); Roosta (E, 1999) and Irkutsk (RU, 2000). The Environmental Physics group at the University of Girona is pleased to host the sixth workshop from 27-29 June 2001. The workshops are intended to be a platform for the European scientists to exchange ideas and discuss ongoing research on topics related to physical processes in inland and coastal waters, lakes and reservoirs. Of special interest is interdisciplinary work linking physical, biological and chemical processes and observational techniques.

In the sixth workshop we have endeavored to attract the participation of non-European scientists and to broaden the scope of the meeting. Whereas previous Workshops focused on transport, mixing, turbulence and stratification in natural waters, the scope of the 6th Workshop has been extended to include freshwater and saline water balances, coastal engineering and oceanography. This report contains contributions to the 6th Workshop, that were submitted for this volume by their authors as the latest results of their research. The publication of these Proceedings have been partially funded by the Environmental Institute (IMA) of Girona University.

Xavier Casamitjana,
Girona 2001

Wednesday, 27th June

9.00 Opening

Morning Session
Chair: Elena Roget

9.10 Invited Lecture: Joe Fernando
Turbulence and mixing in Oceans

10.00 -10.30 Jaume Piera, E. Roget, J. Catalan
Length scale analysis of turbulent patches in wind-forced stratified waters

10.30-11.00 Andreas Lorke, Lars Umlauf, Tobias Jonas, Alfred Wuest
Dynamics of turbulence in the oscillating bottom-boundary layer of a lake

11.00-11.30 Break

11.30-12.00 Madis-Jaak Lilover, K. Bolding, T. Huttula, A. Stips
Observation and simulation of stratified turbulence depending on the
different wind, stratification and shear scenarios

12.00-12.30 Karsten Bolding, Hans Burchard, Adolf Stips
Detailed simulation of observed turbulent dissipation rates during strong
tidal conditions.

12.30-13.00 Andrew Folkard, G. Ciraolo
Laboratory Flume Studies of Turbulent Structures in Flow through
Heterogeneous Seagrass Meadows

13.00-13.30 Ulrich Lemmin, S.A. Thorpe, I Fer
Mixing near the sides of a deep lake in winter

13.30-15.00 Lunch

Afternoon Session
Chair: Joe Fernando

15.00-15.30 Adolf Stips, Tom Rippeth, Harmut Prandke
Comparison of dissipation rates measured by two different profilers in the
North Sea

15.30-16.00 Raj Murthy, Y.R. Rao

Nearshore currents and turbulent exchange processes during summer Stratification in Lake Ontario

16.00-16.30 Graham Copeland, Scott Couch

Eddy Generation by Headlands and Islands

16.30-17.00 Break

17.00-17.30 José L. Pelegrí, Marc Gasser, P. Sangrà

On the temporal memory of turbulence

17.30 -18.00 Kevin G. Lamb

Conjugate flows and the formation of solitary internal waves with trapped cores through shoaling

18.00-18.30 A. Soualmia, M. Moussa, Lucien Masbernat

On the role of turbulence and Langmuir circulations on vertical transfers under wind waves.

18.30-19.00 Dmitrii Mironov, S. Danilov, D. Olbers

Large-Eddy Simulation of Radiatively Driven Convection in Ice-Covered Lakes

Thursday, 28th June

Morning Session

Chair: Geoffrey Schladow

9.00-10.00 Invited Lecture: Jörg Imberger

Characterizing the dynamical regimes of a Lake

10-10.30 A. Ratsimendresy, José Maria Cortés Crespo, L. Ferrer, Ruiz; A. Antoranz, S. Menvielle; V. Serrano, J. Mateu

Seawater intrusion in the Toix-Moraix cave system: Physical processes

10.30-11.00 Eliezer Kit, M. Sladkevich

Structure of Offshore Currents on Mediterranean Coast of Israel

11.00-11.30 Break

11.30-12.00 Anthony Kay
Simple mathematical models of thermobaric flows

12.00-12.30 Tim Fisher, G.A. Lawrence
Double diffusion in the island Copper Pit Lake

12.30-13.00 Bertram Boehrer, H. Gräfe; N. Hoppe; P. Hauptmann, Stefan C. Muller.
In-situ measurements of density and stability

13.00-13.30 Alfred Wüest, Eddy Carmack
A priori estimates of mixing and circulation in the hard-to-reach water body of lake Vostok.

13.30-15.00 Lunch

Afternoon Session
Chair: A Wüest

15.00-15.30 Jochen Appt, Nina Winkler
Effects of a sill and contraction on wind-induced flow evolution in a stratified lake.

15.30-16.00 Francisco Rueda, S.G. Schladow, Sveinn O. Palmarsson
The internal waves of Lake Tahoe during the winter of 1999-2000

16.00-16.30 Sveinn O. Palmarsson, Francisco J. Rueda, Simon J. Hook, Fred J. Prata, S.G. Schadow
Energetics of a large amplitude upwelling event

16.30-17.00 Break

17.00-17.30 Kohji Michioku, Tohru Kanda
A field measurement of vertical entrainment due to nocturnal cooling in a stratified reservoir

17.30-18.00 Erich Bäuerle
Internal seiches versus propagating long internal waves

EXCURSION TO LAKE BANYOLES-DINNER

Friday, 29th June

Morning Session
Chair: Jordi Colomer

9.00-9.30 Xavier Casamitjana, T Serra, J. Colomer, J. Pérez, E. Roget, C. Baserba.

Evolution of the particle boundary layer in a reservoir

9.30-10.00 Bradford Sherman

Spatial and temporal patterns in the distribution of in situ chlorophyll-A fluorescence

10.00-10.30 Thomas M. Powell, Craig W. Lewis, C.A. Edwards

Coupled physical-biological ecosystem models in a coastal upwelling system

10.30-11.00 Daniel McGinnis, J.C., Little, A. Wuest

Hypolimnetic oxygenation: Coupling Bubble-plume and reservoir models

11.00-11.30 Break

11.30-12.00 Teresa Serra, T. Granata, J. Colomer, X. Casamitjana

The vertical distribution of phytoplankton as a result of turbulent mixing and advection in the water column

12.00-12.30 Joaquim Pérez-Losada, S.G. Schladow, J.E. Reuter, A.D.

Jassby, C.R. Goldman, E. Roget

Modeling seasonal and long term water quality changes in lake Tahoe

12.30-13.00 Geoffrey Schladow, X. Casamitjana, J.E. Coker, T.J. Swift,

J.E. Reuter

Toward a deterministic model for clarity changes in lake Tahoe

13.00-13.30 Ben-Jei Tsuang, Chia-Ying Tu, Klaus Arpe

Lake parameterization for climate models

13.30-15.00 Lunch

Afternoon Session
Chair: Erich Bäuerle

15.00-15.30 Johannes Bühler, Ch.Siegenthaler
Diurnal temperature variations in a pumped storage reservoir

15.30-16.00 John Bush
Particle Clouds

16.00-16.30 Georgy Kirillin, D. Mironov, A. Terzhevik
Radiatively-driven Spring Convection in Ice-covered Lakes: The effect of salt concentration.

16.30 Closure

Poster Session

Ben R. Hodges, Dendritic Reservoirs B. Wadzuk
Model bathymetry for sinuous dendritic reservoirs

Teresa Serra, Harindra J.S. Fernando, Rodolfo B. Rodriguez
The role of the emergent vegetation on lateral diffusion in wetlands

Elena Tsvetova
Fast data assimilation for lake studies

Georg Kirillin
On self-similarity of thermocline in shallow lakes

Görkay Karakas, B. Boehrer
Simulation of natural convection in enclosures in acidic mining lakes