Il Progetto di Interesse NextData - Un sistema nazionale per la raccolta, conservazione, accessibilità e diffusione dei dati ambientali e climatici in aree montane e marine.

The use of sedimentary proxies in lakes for inferring the environmental changes during the late Holocene

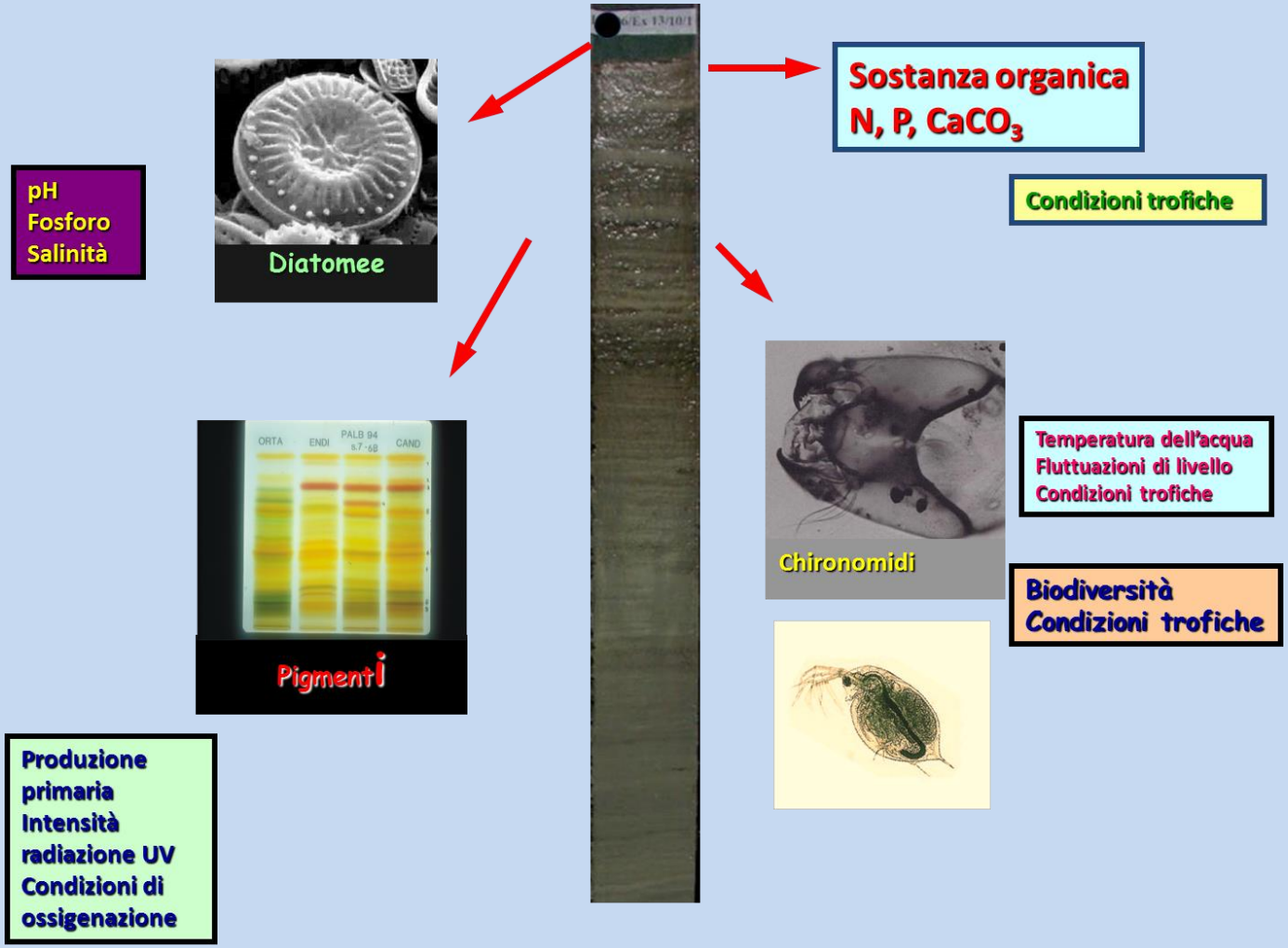
LAMI Andrea

C.N.R. Istituto per lo Studio degli Ecosistemi (ISE) Verbania

http://www.ise.cnr.it

Roma, 24 Gennaio 2017

Obbiettivo dei proxy sedimentari è quello di ricostruire in modo continuo su scale temporali lunghe (200-2000) con una risoluzione elevata (2-10 anni) i cambiamenti nell'ecosistema lacustre e nel suo bacino imbrifero per valutare nello spazio e nel tempo i cambiamenti globali.



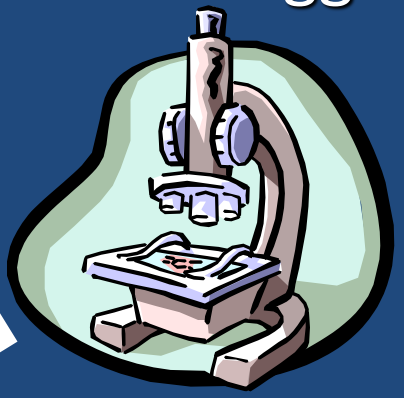
Metodi

Campionamento

Datazione

Digestione

Montaggio
e conteggio



Analisi quantitativa

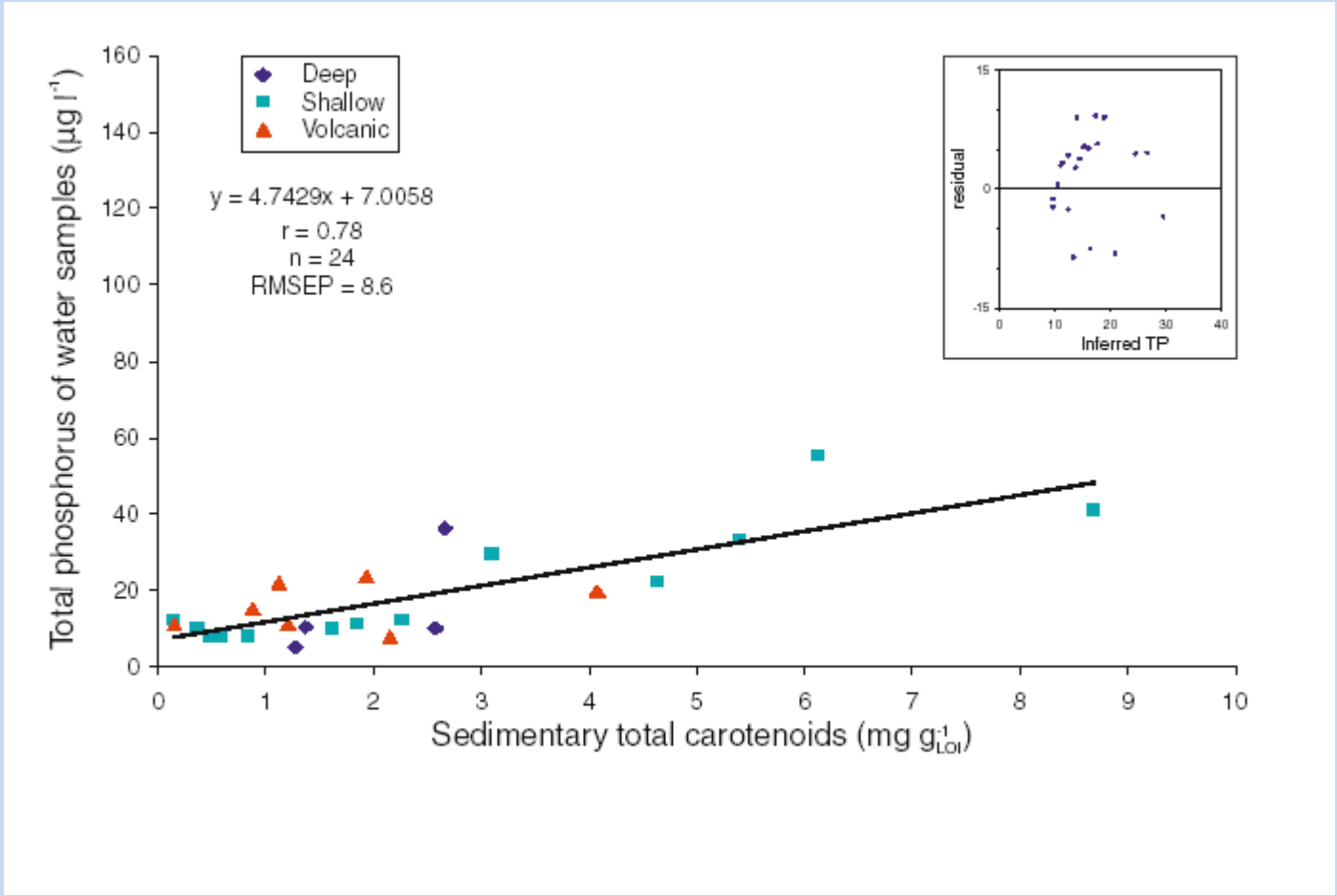
Modelli numerici per ricostruire TP

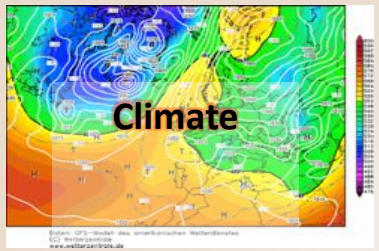
J Paleolimnol (2011) 45:433–445
DOI 10.1007/s10933-010-9421-9

ORIGINAL PAPER

Use of sedimentary pigments to infer past phosphorus concentration in lakes

Piero Guilizzoni · Aldo Marchetto · Andrea Lami · Stefano Gerli · Simona Musazzi





Ecosystems ecological responses?

review article

Ecological responses to recent climate change

Gian-Reto Walther*, Eric Post†, Peter Convey‡, Annette Menzel§, Camille Parmesan‖, Trevor J. C. Beebee¶, Jean-Marc Fromentin#, Ove Hoegh-Guldberg☆ & Franz Bairlein**

** Institute of Geobotany, University of Hannover, Nienburger Str. 17, 30167 Hannover, Germany*
† Department of Biology, The Pennsylvania State University, 208 Mueller Lab, University Park, Pennsylvania 16802, USA

Global Change Biology (2002) **8**, 390–407

Assessing effects of forecasted climate change on the diversity and distribution of European higher plants for 2050

M. BAKKENES, J. R. M. ALKEMADE, F. IHLE, R. LEEMANS and J. B. LATOUR
National Institute of Public Health and Environment, P.O. Box 1, 3720 BA Bilthoven, the Netherlands

"There is now ample evidence of the ecological impacts of recent climate change, from polar terrestrial to tropical marine environments. The responses of both flora and fauna span an array of ecosystems and organizational hierarchies, from the species to the community levels. Despite continued uncertainty as to community and ecosystem trajectories under global change, our review exposes a **coherent pattern of ecological change across systems**. Although we are only at an early stage in the projected trends of global warming, ecological responses to recent climate change are already clearly visible."

Dokulil *et al* 2010. The impact of CC on Lakes in Central Europe

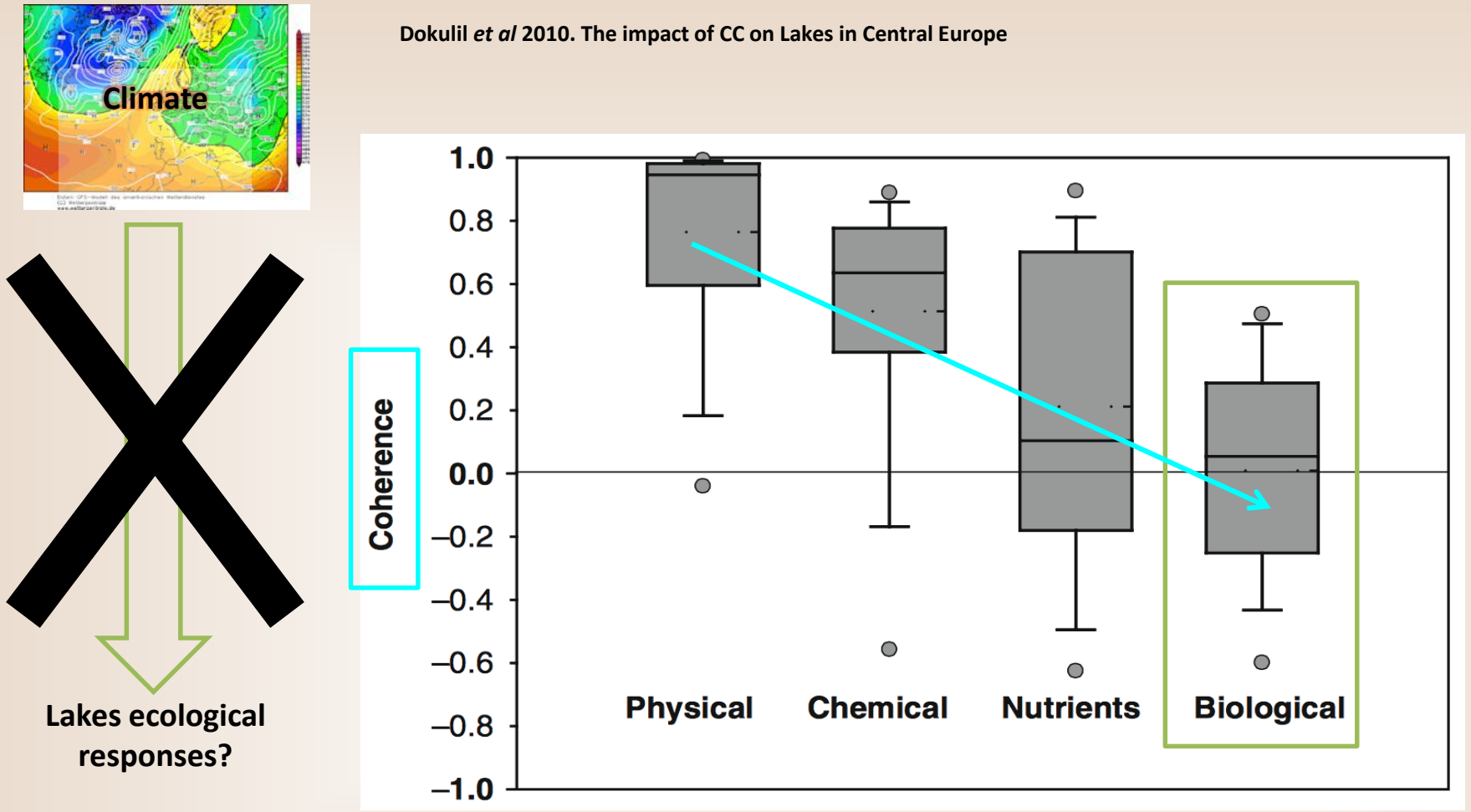
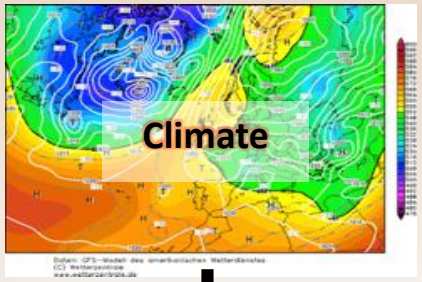


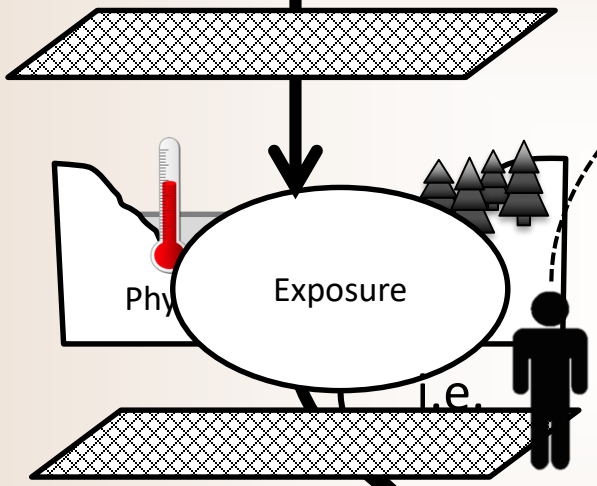
Fig. Regional coherence (expressed as correlation coefficients) between pairs of six alpine lakes in the Austrian 'Salzkammergut' region shown as box-whisker plots. Box limits are the 25th and 75th percentile; whiskers indicate the 10th and 90th percentile. In these boxes, the solid line is the median, the dashed line the mean. Physical = surface temperature, light attenuation and Secchi- depth; chemical = pH, conductivity and oxygen concentration; nutrients = total phosphorus, total nitrogen and dissolved silica; biological = chlorophyll-a and phytoplankton biomass. (Modified from Dokulil and Teubner, 2002)

Degree of coherence among lakes

(Dokulil *et al.*, 2010; Livingstone *et al.*, 2010)



Local weather, topography



Local human pressure

Increase

Lower

Sensibility (Responses amplitude)

Capacity of responses (Adaptations)

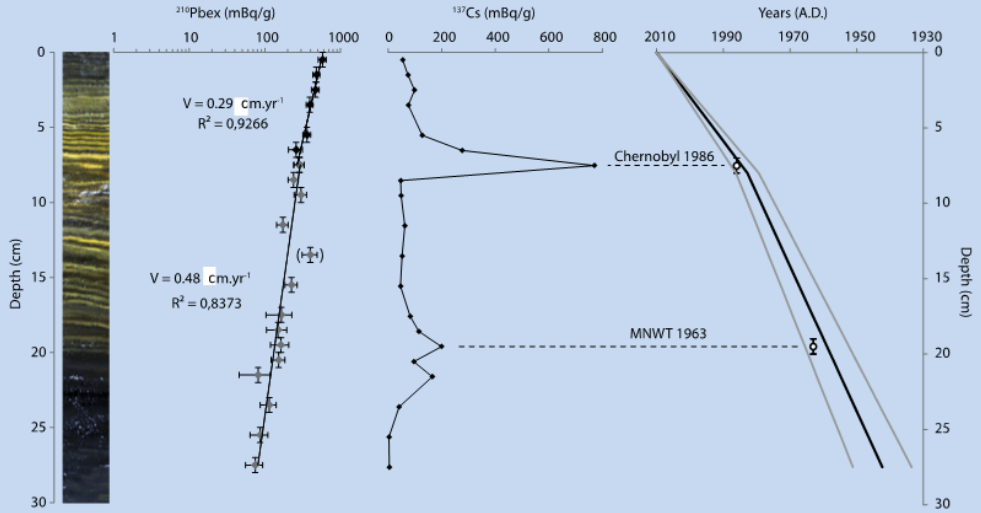
Ecosystem vulnerability

(Gallopin, 2006; Adger, 2006; Mumby *et al.*, 2014)

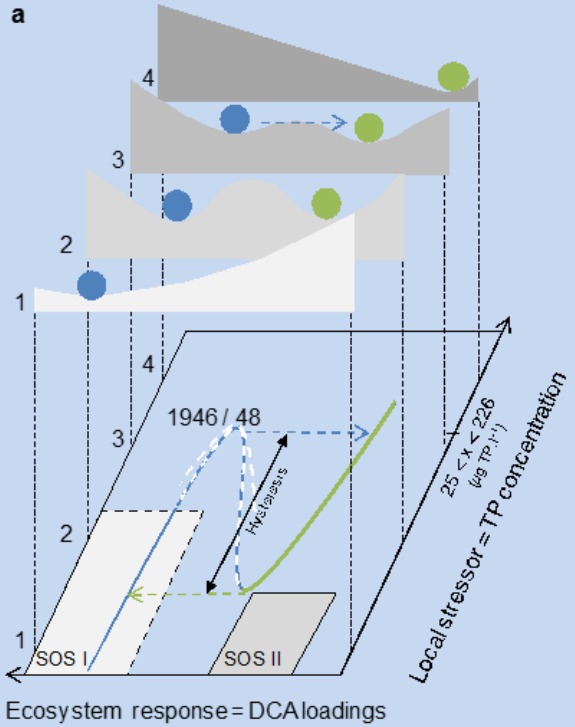
Does local human impact increase ecosystems vulnerability to climate change?

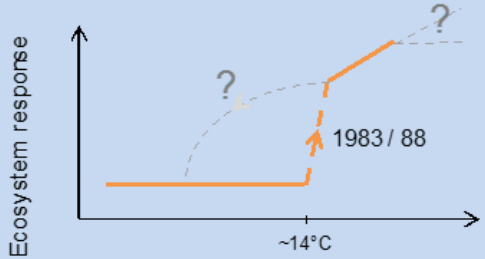
What are the components of ecosystems vulnerability?

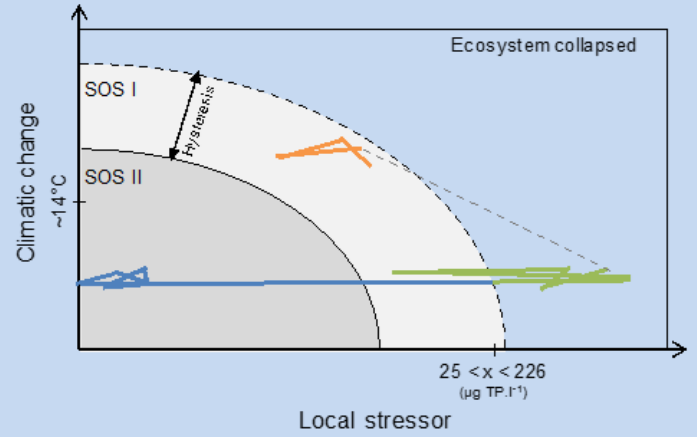
Lake Varese:
Assessment of regime shifts: application to the long-term ecological trajectory of a lake under multiple forcings



2-3 year resolution
170-yr-long paleo-ecological record








Lago Lugano 2010
Varese, Comabbio, Monate, Pusiano, 2010-2011
Tovel, 2001
Lago Maggiore 1998-2010
Colbricon, 2010
Ledro, 2012
Lago di Avigliana 2008
Garda 2011
Bolsena
Bracciano,
Albano
Nemi
(Paliclas 1994)
Monticchio 2006


Grazie per l’attenzione