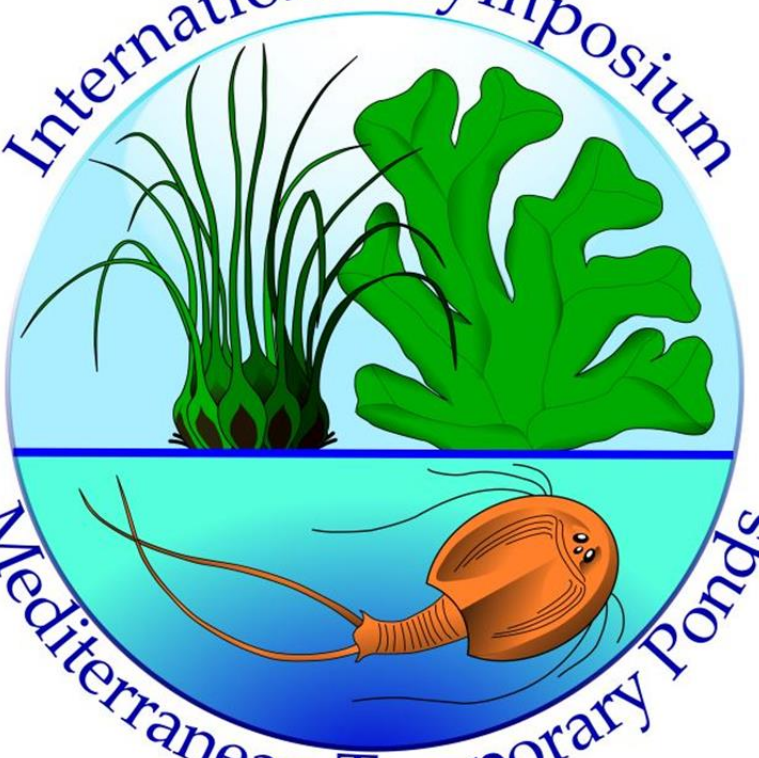
BOOK OF ABSTRACTS

International Symposium Mediterranean Temporary Ponds



Sassari, April 15-16-17, 2015

PaulisProject

REGIONE AUTONOMA DELLA SARDEGNA

uniss UNIVERSITÀ DEGLI STUDI DI SASSARI

Università degli Studi di Cagliari

Universitat de Girona Institut d'Ecologia Aquàtica

Stefania Pisanu and Simonetta Bagella (editors)

Papers should be cited as (e.g.):

Bagella S., Boix D., Caria M.C., Compte Ciurana J., Gascón S., Filippino G., Pisanu S., Elena Pittao E., Sala J., Cogoni A., 2015. "PAULIS" PROJECT: a challenge from a neglected habitat. In: Pisanu S. and Bagella S. (eds.) International Symposium on Mediterranean Temporary Ponds. Book of abstracts. Edizioni P.Ass.I.Flora Ambiente, Italy. p. 5

ISBN 978-88-940864-0-9

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LINKING WATER STOCK IN MEDITERRANEAN TEMPORARY PONDS WITH HYDROLOGICAL BALANCE AT LANDSCAPE SCALE

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Water stock in Mediterranean Temporary ponds results from the hydorological balance between direct or indirect rainwater supply (inflow) and losses in the atmosphere, overflow, infiltration (outflow). Losses into the atmosphere are due either to evapotranspiration, which includes evaporation from open water, soil and canopy dampened by the rain and plant transpiration.
The high variability in seasonal and inter-annual rainfall, typical of Mediterranean climate, makes water dynamic in Mediterranean temporary ponds unpredictable. On the other side flooding duration, dates of flooding and drying out, size of the inundated area and water depth characterize the different habitats which occupy the same space throughout the time offering place to organisms with contrasting water requirements, i.e. aquatic, amphibious and terrestrial, duration of their life cycle, their phenology and the success in reproductive processes.
Long-term monitoring of water stock in the ponds and its relationships with the hydrological balance could provide a sound information for better understanding species distribution models and phenology, for the management of the habitat and also to evaluate the effects of climate changes under different scenarios. The lack of this information is due to the need of long time-series of data and to the high cost of both hydrometric equipment and hydrological/hydrogeological studies.
Our research was aimed to relate the hydrological balance evaluated at landscape scale with the presence and size of over 100 ponds using historical series of meteorological data and satellite images freely available online. The study area is located in Sardinia, on a 44 km^2 basaltic plateau, 550 m a.s.l, named Giara di Gesturi.
Daily hydrological balance was assessed considering rainfall and potential evapotranspiration calculated using Hargreaves equation on a data set from the nearest meteorological station. Water stock was evaluated considering as proxies both the presence/absence and size of ponds, which have been visually interpreted and delineated by computer-aided visual interpretation on 89 Landsat images acquired between 1984 and 2014. Relationships between hydrological balance and water stock were tested using the Pearson correlation coefficient considering different overflow values.
The results show a high significant correlation between the hydrological balance and the proxy of water stock.