Abstract
'Mediterranean Temporary Ponds' (M.T.P.) constitutes a priority (Natura code: 3170*), substantially vulnerable and unstable habitat. A Life project has been conducted (www.life-medponds.gr) entitled: 'Actions for the conservation of Mediterranean Temporary Ponds habitat in Crete' aiming in eliminating the threats and restoring the relevant habitats of Western Crete. One of the most important potential threats is climate change that can alter the flooding duration of the ponds (hydroperiod) significantly.

In this report we quantitatively explore the influences of climate change on the hydroperiod of two Mediterranean Temporary Ponds (MTPs) in Crete, using: (i) a physically-based, distributed lake basin model in the case of Lake Kourna, where the hydrology of the lake is directly related to that of the adjacent MTP and (ii) a conceptual/mathematical model of an MTP in Omalos. The effects of two IPCC climate scenarios on Lake Kourna and Omalos MTP water levels are then investigated. In the case of Lake Kourna, the approach we present here, although data demanding, allows us to explore the temporal and spatial dynamics and interrelationships between basin characteristics, the climate and surface water management, while in the case of Omalos a more simplistic, MTP (rather than basin) targeted approach is followed, although non stationarity in the catchment cannot be accounted for in its present form, and therefore a reconstruction of the mathematical model to account for such factors is needed.

Climate change Scenarios
In order to have an indication of the impact of climate change on Lake Kourna water level (and consequently on the adjacent MTP) and on the MTP water level in Omalos, two future climate scenarios were applied according to the IPCC (2007) climate predictions:

- One "pessimistic" A2 IPCC scenario for 3.5^{o}C increase in temperature (with respective increase of evaporation and evapotranspiration) and 0.25 mm/day decline of precipitation; and
- one more "optimistic" B2 IPCC scenario for 2.5^{o}C increase in temperature (with respective increase of evaporation and evapotranspiration) and 0.25 mm/day decline of precipitation.

The only variables changed in the model were precipitation, evaporation and evapotranspiration. The results were then assessed by comparing the simulated water levels with the baseline-current scenario.

The impact of climate change on Lake Kourna water level (and consequently on the adjacent MTP) and on the MTP water level in Omalos, was assessed by applying two future climate scenarios. Results for IPCC B2 and A2 climate scenarios show longer hydroperiod and smaller decreases in the future for Omalos MTP than in Lake Kourna MTP. Results for Lake Kourna MTP demonstrated a hydroperiod decrease of more than 52 days after the application of the IPCC scenarios. Scenario A2 does not present a significantly differentiated-higher impact on the MTPs' hydroperiod. In particular, a difference of 3 to 15 days compared with IPCC scenario B2 predictions was estimated in the case of Lake Kourna and 5 to 8 days, for the MTP in Omalos.

Thus, the lowland MTP proved to be far more vulnerable to Climate Change in relation to the mountainous one since the percentage decrease of its hydroperiod reaches 68% which could be detrimental for the pond fauna and flora if it occurs. This difference between the lowland and the mountainous pond is consistent with results from similar climate change impact studies (Blenckner 2005) that indicated different responses in various lakes depending on the local geographic and biological conditions. There are no similar applications focusing on modelling hydroperiod of Mediterranean Temporary Ponds in the literature since this habitat is not yet well studied.