BINGO PROJECT: CLIMATE CHANGE AND THE GROUNDWATER COMPONENT OF THE WATER CYCLE

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ABSTRACT

Climate change is bound to impact the water cycle and water availability, compounding the sustainable management of its quantity and quality. Groundwater is bound to suffer the impacts of climate change, coupled with those of land use changes, population and its lifestyles evolution. Climate change studies normaly have a 50 to 100 years horizon, which is a challenge for decision makers, who usually rely on relatively short therm data and projections to implement their management policies. BINGO Project tries to address this gap, by providing information of climate change impacts, including those of extreme events, on the water cycle for the short-to-medium term. Climate change impacts on groundwater rely on mathematical modeling, using recharge projections obtained from the climate forecasts of the Regional Climate Models set up for Europe. Sea level change is also a component of this analysis and its ensuing impacts of saltwater intrusion on the coastal and estuarine areas of Aluviões do Tejo and Bacia do Tejo-Sado/Margem Esquerda aquifers.

Palavras-Chave: climate change; groundwater; water management; FEFLOW

1. INTRODUCTION

While the generality of studies regarding climate change focus on what will happen on 50 to 100 years, adaptation must start now and the policy makers face a roadblock once it is difficult for them to implement policies, namely adaptation, relying on projections of what will happen 100 years from now. BINGO Project (http://www.projectbingo.eu/) is a Horizon 2020 project set to address this problem by assessing the impacts (acute and cumulative) of climate change, including weather extremes on the water cycle (quantity and quality components) for a 10 year period, based on more reliable short-to-medium term meteorological forecast, coupled with water cycle variability, including extreme events, in an integrated analysis of surface and groundwater interactions and the sea influence in the riverine and coastal aquifer areas and land use change. It also as the goal of develop risk management/adaptation strategies for extreme weather and climate change-related threats, including a portfolio of validated risk adaptation strategies, taking into account socio-economic factors, financing and policy contexts as well as scenarios of land use, urban pressures and water demands. In order to tailor a good and practical set of adaptation measures, the project, developed in 6 EU countries (Fig. 1), relies on a thorough participation of end users.
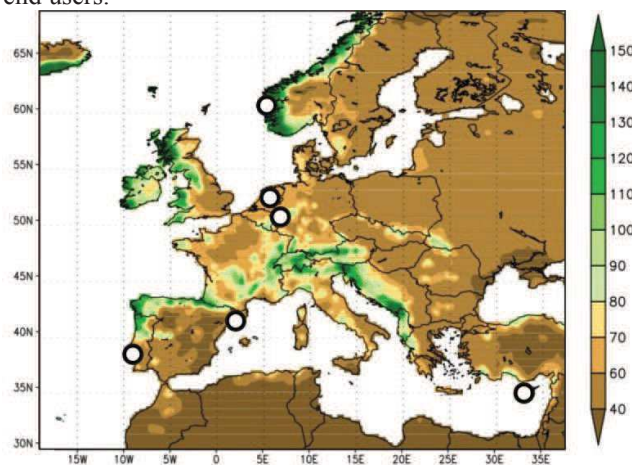

Fig. 1. Map of annual mean precipitation (mm/month), 1951-2000, and BINGO research sites (6 dots) (Adapted from: GPCC Climatology, Version 2011)