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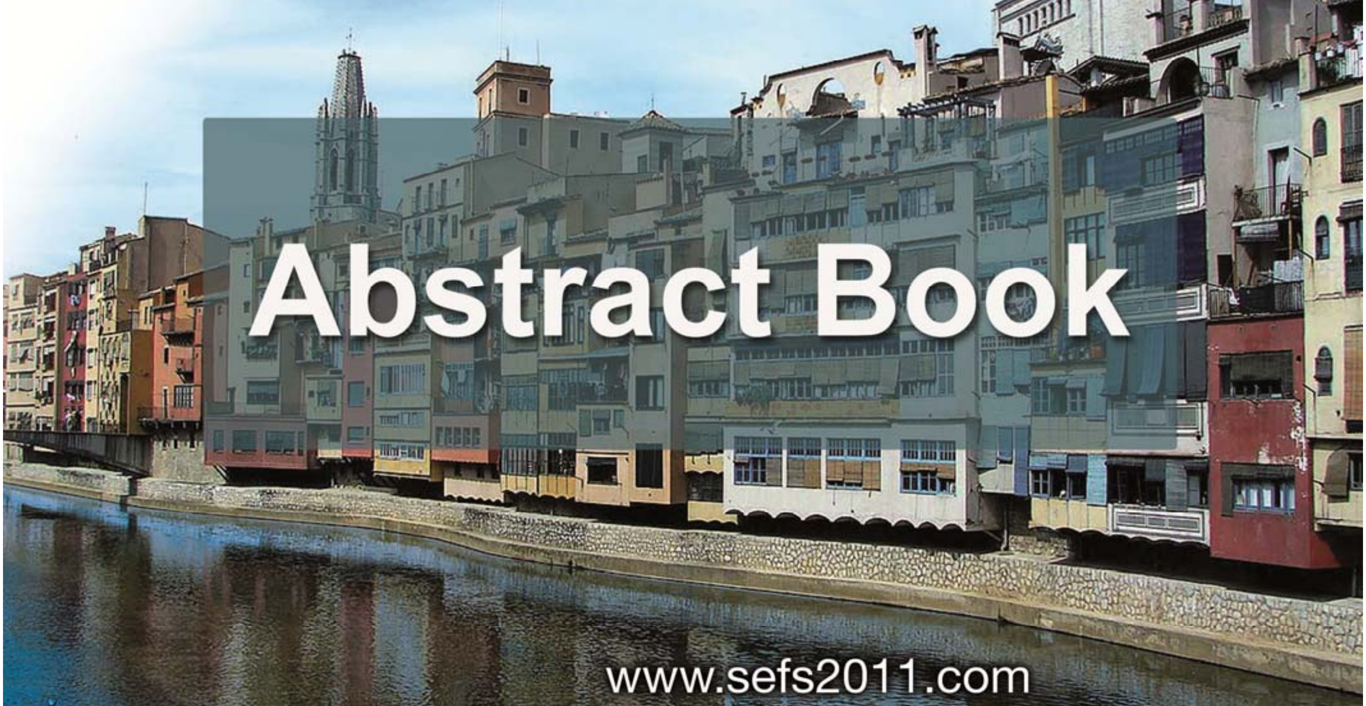

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APPROACHING THE INTERACTION OF CLIMATE CHANGE AND INVASIVE SPECIES USING SPECIES DISTRIBUTION MODELS

Climate change and invasive species are acknowledged as two of the most important causes of biodiversity loss in freshwater ecosystems, and they are expected to cause major species extinctions in the near- and long-term future. Invasive species are more likely to adapt to changing climatic conditions than native species because they are usually abundant, tolerate a broad range of climatic conditions, cover wide geographic ranges and have highly competitive biological traits. However, few authors have identified specific consequences of climate change for invasive and native species simultaneously. In this study, we evaluate the joint threat posed by climate change and two invasive species (Dreissena polymorpha and Pacifastacus leniusculus) on the distribution of two endangered freshwater species (Pseudoanodonta complanata and Austropotamobius pallipes). To that end, species distribution models (SDMs) were calibrated with the species current distribution in Europe and projected onto current and future climatic scenarios. As a result, the 2050 scenario suggests that D. polymorpha will benefit from climate changes (+47% range size) moving its range of distribution up to 3¢ªN latitude, and spreading in Russia, Denmark or Norway. Accordingly, its overlap with the native P. complanata is predicted to increase (from 60 to 66%). In contrast to our predictions, the ranges of both P. leniusculus and A. pallipes are contracted ca. 20% under a climate change scenario, and their overlap decreases (from 70 to 65%). Areas showing an increasing climatic suitability for invasive species in the north of Europe should be monitored for early detection; whereas invasive species under decreasing climatic suitability in southern Europe may become more vulnerable to eradication plans. Results from this study provide important insights into the joint threat posed by climate change and invasive species on native species, and how SDMs can inform effective prevention of species invasion and conservation of native species over large-scales.

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CLIMATE CHANGE SCENARIOS EFFECTS ANALYSES OVER THE RIPARIAN VEGETATION DYNAMICS IN A MEDITERRANEAN REACH (MIJARES RIVER, SPAIN)

Mediterranean rivers are considered among the most threatened environments by the climate change. Terde is a natural stretch located in the Mijares River (Spain) which has been considered as a representative study site to analyze the potential effects of climate change over the Mediterranean riparian vegetation. Two climate change scenarios were selected as the more probable pessimistic and optimistic emission scenarios for the 2070-2100 period, SRES A2 and SRES B2 respectively. The reference period (1960-1990) hydrometeorological series were adapted to consider the monthly variations expected by the HadCM3-PROMES regional climate model. The temperatures series were increased additively. Consequently, the input potential evapotranspiration was higher for the climate change scenarios. The precipitation and flow daily series were modified multiplicatively to obtain the scenarios required inputs, resulting on lower values for the flow series and precipitation series with no clear tendencies of increase or decrease comparing to the reference period data. Both the reference period and the climate change scenarios were analyzed with two different models. By the RibAV model, for riparian zonation analyses, we considered the evapotranspiration index to decide which plant functional type was simulated in each simulation point at the end of the analysed period. With the RIPFLOW model, for vegetation distribution in space and time analyses, we simulated the vegetation succession or retrogression in response of physical parameters. The results were coherent with both models, in terms of a relatively small impact and in the same direction. With the two climate change scenarios, the riparian area shows a decrease of the early succession phases, a major presence of gravel bars near the channel, an increase of older phases presence and a generalized reduction on evapotranspiration rates at the end of the period under climate change assumptions. These simulated trends were more pronounced in the worst scenario.