THE VALUES OF COASTAL RECREATION IN EUROPE'S SEAS AND THE IMPACT OF CLIMATE CHANGE

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Coastal tourism and recreation have become a primary contributor to the well-being of large populations and a major cause of habitat conversion and degradation (Millennium Ecosystem Assessment, 2005). Sustainable management of coastal recreation require a thorough assessment of its value in the relevant policy context. The economic valuation of recreational activities is, however, a particularly challenging undertaking given that their welfare impact is for a large part not reflected in market transactions or remains out of the scope of most analyses because embedded in related markets. Although the number of applications of non-market valuation techniques to coastal recreation is rapidly growing, valuation studies typically have a limited geographical scope and are restricted in the considered range of socio-economic contexts. Value transfer techniques are a potentially attractive option, since they provide tools to assess values in sites where a primary valuation study is lacking and scale them up at the level of policy interest. Transfer errors, though potentially large, may be compatible with policy needs in the prioritization and planning stages.

This paper examines the welfare dimension of the recreational services of coastal ecosystems and evaluates the potential impact of climate change thereupon. A spatially explicit technique is developed to scale up recreation values at the regional and national level. First, we construct a global, state-of-the-art database of primary valuation studies that focus on coastal recreation benefits. Second, the profile of each of the 177 individual observations is enriched with characteristics of the built coastal environment (accessibility, anthropogenic pressure), natural coastal environment (ecosystem type, marine biodiversity), geo-climatic factors (temperature, precipitation), characteristics of the recreation trip (trip length, type of recreation activity), and sociopolitical context (coastal population density, GDP per capita). We then propose a meta-analytical framework that is built upon a Geographic Information System (GIS) and allows for the exploration of the spatial dimension of the valued ecosystems, including the role of spatial heterogeneity of the selected meta-regression variables as well as the spatial profile of the transferred values. Factual and methodological heterogeneity that may account for differences in the observed effect-sizes are controlled for in the study selection criteria and meta-regression.

The estimated coefficients of the best-fit regression model are found to generally reflect a priori expectations. Recreational activities taking place in near shore waters and lagoons produce the highest per-trip values. Sport fishing, hiking, viewing and swimming are the least highly valued recreational activities among those considered on a per-trip basis. The coefficient of real GDP per capita is positive, indicating that income plays a role in explaining the reported values. The individual preferences of recreationists are found to lean, on average, towards more pristine conditions, as reflected by low population density and anthropogenic pressure on water quality. Richness in marine biodiversity is found to attract recreationists and the importance of climatic variables is confirmed by the coefficient of the temperature variable, indicating higher values for warmer, Mediterranean climates. Same-day trips are less highly valued than trips with overnight stay, accounting for substitution effects in the primary valuation studies produces lower value estimates, and studies assessing the welfare impact of an environmental change produce statistically lower values than studies

assessing the total consumer surplus of the recreational experience at the investigated sites. The highest estimates are produced by the travel cost method (individual and RUM) and contingent behavior method.

A value transfer and scaling up exercise is then performed to map the values of coastal recreation in the European coastal zone and evaluate the potential impact of climate change. Individual, per-trip and aggregated value estimates are produced for 372 coastal regions (at the NUTS-3 administrative classification level) in EU-22 countries. GIS tools and map algebra are used to assess the value of the moderator variables in each of the considered regions and calculate the aggregated recreation value at regional level. The effect of climate change are investigated based on the storylines of the four IPCC scenario families and introduced in the meta-regression model through changes in the values of the context variables and total number of tourist arrivals per year. The main empirical outcome of this study is the first map of coastal recreation values in the European coastal zone and climate change impacts. We argue that the map may play a crucial role in identifying and ranking coastal areas conservation priorities from a socio-economic perspective.