

## Melina Kourantidou

Department of Sociology,  
Environmental and Business  
Economics (SEBE),  
University of Southern Denmark

Niels Bohrs Vej 9  
DK - 6700 Esbjerg  
E-mail: mkour@sdu.dk

Melina Kourantidou is a researcher affiliated with the MERE Research Group, at SEBE, SDU.

She is interested in the effects induced by the recent ecological and related socioeconomic changes taking place in Arctic ecosystems. The focal point of her research is on the stewardship of Arctic marine resources threatened by invasive species as a result of the many economic and ecological changes developing in the region. Her work focuses on integrating ecological and economic models and evaluating feedbacks between ecological and economic systems.

She is an environmental and resource economist by training, having acquired in 2011 her MSc in Forest Economics from Aristotle University of Thessaloniki. She has previously worked for several years as an economist in Greece providing consultancy services for a wide range of projects in both the private and public sector, including several environmental policy projects.



PhD Dissertation of

## Melina Kourantidou

at the Department of Sociology,  
Environmental and Business Economics,  
University of Southern Denmark

Should Norway's Quota Area for  
Red King Crab be changed?

Lessons from the Red King and Snow  
Crab Invasions in the Barents Sea for  
managing shifting ecosystem values,  
productivities, and uncertainties

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# Should Norway's Quota Area for Red King Crab be changed?

## Stewardship of resources in rapidly evolving Arctic economies and ecosystems: The role of marine invasive species

Arctic marine ecosystems are experiencing profound changes driven by climate change and increasing anthropogenic activity. Prominent features of stressors in the Arctic include observed changes in oceanographic variables as well as other ecological disturbances which are anticipated to continue and accelerate in coming years. Such changes are expected to substantially assist in the expansion of non-indigenous species northward. Of major concern is that the thawing Arctic waters enable economic development in the region and increase the risk for human-mediated exogenous arrivals. Invasive species are considered one of the most important inadvertent drivers of biodiversity loss and are known for exerting strong impacts on human welfare. When those species are also viewed as valuable resources that support local economies, conservation agents and resource managers are charged with balancing the socio-economic benefits of harvesting with the declining ecosystem health caused by the invasion.

With those challenges in mind, the thesis herein addresses the effects induced by the recent ecological and related socioeconomic changes taking place in the Arctic marine environment. The focal point is on the determinants of economic and ecological changes in Arctic marine resources as a result of the way commercially valued invasive species are managed.

The six papers of this dissertation are motivated by the invasions of the Red King Crab and the Snow Crab in the Barents Sea, but have broader implications. They address bioeconomic trade-

offs associated with invasive species management - a challenge for which losses from the invasion are just one input. The papers seek to inform ways to achieve socially desirable outcomes by assessing policies and decision-making processes at the intersection between conservation of Arctic marine ecosystems and socioeconomic welfare of fishing communities.

The thesis reappraises the role of commercial harvesting as a management tool for controlling invasive species. The lack of knowledge and scientific consensus about features of the invasion does not reduce the need to act on little information. The institutional structures in place for combatting invasive species in the Arctic have many gaps. Invasive species are externalities to trade and economic development, and as such call for regulatory intervention across political and national boundaries that require incentive-compatible cooperation. Such cooperation may be particularly difficult in light of imperfect information about the net benefits of prevention of invasive species. Those benefits are also unequally distributed according to bio-economic conditions and therefore warrant more research into optimal control frameworks that can assist in decision-making and assessment of management strategies. Understanding the economic incentives, the different stakeholders' interests, and the underlying trade-offs behind biological invasions is central to optimal management and efficient allocation of resources.

*Melina Kourantidou*

## Department of Sociology, Environmental and Business Economics

The Department of Sociology, Environmental and Business Economics is part of the Faculty of Business and Social Sciences at the University of Southern Denmark. It has several distinct research groups.

The Management and Economics of Resources and the Environment (MERE) group researches topics in environmental and natural resource economics. The group puts specific emphasis on economic uses of the interlinked biosphere and biophysical systems. Applications focus on ecosystem conservation and use; marine resource use and conservation; energy transitions; climate regulation; and intersections of technology, trade and development relating to these issues. These are all components in the broad societal drive for sustainable development. Researchers in the MERE group use economic tools to untangle the web of interacting, multidimensional environmental and resource risks, needs and impacts on ecosystems and ecosystem services from human activity (incentives, history) and its organization in the forms of its institutions, norms, and regulations.

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