H.F.R.I.
Hellenic Foundation for Research & Innovation

Description of the funded research project

1st Call for H.F.R.I. Research Projects to Support Faculty Members & Researchers and Procure High-Value Research Equipment

Title of the research project:

Systematic conservation planning under climate change: developing a holistic approach for charismatic marine megafauna

Principal Investigator: **Antonios Mazaris, Assoc. Prof.**
Department of Ecology, School of Biology, Aristotle University of Thessaloniki

Reader-friendly title: **SYSTEMA**

Scientific Area: **Environment and Energy**

Institution and Country: **Aristotle University of Thessaloniki, Greece**

Host Institution: **Aristotle University of Thessaloniki**

Collaborating Institution(s): **National Marine Park of Zakynthos (NMPZ)**

Budget: **163.178,07**

Duration: **31/03/2020 – 31/01/2023**

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Research Project Synopsis

SYSTEMA aims to develop and apply an integrated, strategic, spatial conservation planning framework to foster our capacity for conservation of marine megafauna across spatial and temporal scales, under climate change.

Using sea turtles as model species, the framework will propose actions to address multiple threats to biodiversity while minimizing socioeconomic costs.

Project originality

New methodologies for **incorporating climate change into Systematic Conservation Planning**

Hybrid distribution models coupled with climate-regulated **dynamic energy budget** models

An advanced framework for modeling **climate change velocity**

Monitoring protocols based on **new technologies**

The first comprehensive assessment on the importance of **connectivity** among **different life stages** for **multi-realm species**

The application of principles of **circuit theory** for modeling ecological **connectivity** at the seascape

A modeling framework towards recognizing **climatic refugia**

A **3D** spatial conservation planning **model** that will incorporate **dispersal** and **climate change**

Expected results & Research Project Impact

SYSTEMA

1. Development of innovative methodologies (e.g. Unmanned Aerial Vehicles-UAVs, laser scanners, sensors) for monitoring marine megafauna

2. Development of "hybrid" approaches and dynamic energy budget models for modeling range dynamics

3. Development of new methods for exploring how climate change could alter patterns of connectivity

4. Development of a dynamic, free-scale Biotic velocity model, towards detecting future habitats (i.e. stepping stones, climate analogs and climate refugia) for different life history stages

5. Development of a 3D marine spatial planning framework with respect to the principles of SCP, accounting for the vertical heterogeneity and ocean zoning

6. A comprehensive systematic conservation planning methodology which would incorporate the impacts of climate change across multiple realms and spatial scale.

The importance of this funding

SYSTEMA will:

- provide recommendations and guidelines that can be used for the improvement of marine conservation instruments and policies in Europe,

- support the objectives of the marine spatial planning,

- will offer the means to improve conservation capacity under climate change and multiple human activities,

- will enhance our capacity to fulfill the targets of “Blue Growth” and offer optimized approaches for multi-scale biodiversity monitoring and conservation.

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