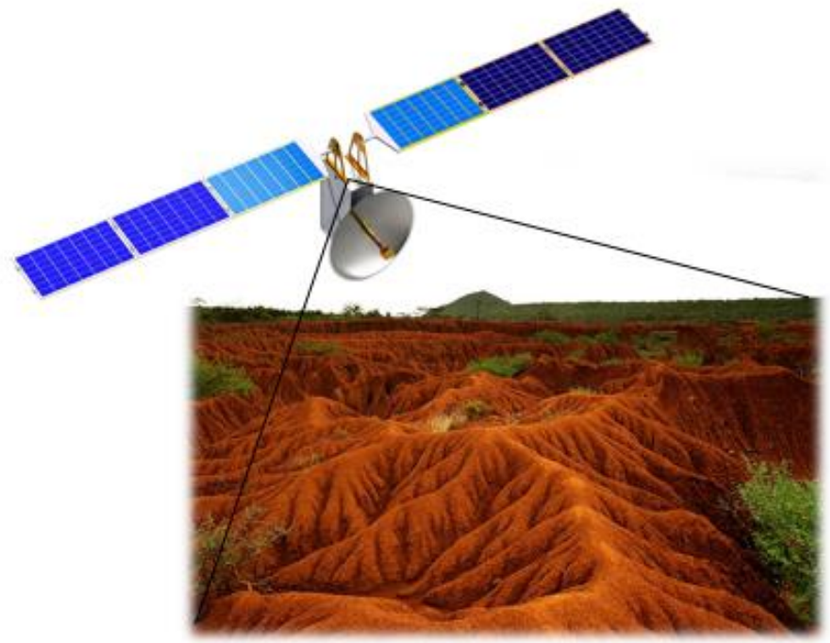
Description of Funded Research Projects
1st Call for H.F.R.I. Research Projects
to support Post-Doctoral Researchers

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

Research Project Title:

Development of an integrated 5-Dimensional space-based methodology for Assessing and modeling the Response of Erosion dynamics to land use and climatic changes in Mediterranean watersheds

Principal Investigator:
Dimitrios Alexakis



5DARE- **Development of an integrated 5 Dimensional space based methodology for Assessing and modeling the Response of Erosion dynamics to land use and climatic changes in Mediterranean watersheds**

Popular Title:
Using space technology to estimate soil erosion rates in Mediterranean basins

Scientific Field:
Natural Sciences

Host Institution:
University of Crete

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

Soil erosion is as a major environmental problem since it seriously threatens natural resources, agriculture and the environment. 5DARE project will assess the impacts of a changing climate, land use, soil moisture, hydrology and vegetation cover, on the quantity of erosion processes in two catchments in the island of Crete / Greece. Modelling techniques will be used to project the influence of changes of above-mentioned factors on the major determinants of erosion processes, at various time and space scales, in the near and far future. Regional climate scenarios will provide the essential information on shifting precipitation and temperature patterns, and will feed into erosion models in order to assess the changes in seasonality, amount, and incidence of extreme events in the catchment areas.

Field experiments will be conducted in different kind of crop cultivations (orange trees, avocado trees, olive orchards). The main aim of field experiments will be to calibrate erosion assessment models and upscale soil loss results, from farm to regional level. In addition, sophisticated classification algorithms will be applied to Very High-Resolution satellite images and Unmanned Aerial Vehicle / Drone images, to collect new data sets of Land Use/ Land Cover (LULC), topography and vegetation. The final stage of research will include selection of the most appropriate erosion model and the forecasting of erosion vulnerability in the near and far future.

The above findings on the spatio-temporal erosion distribution will update the current erosion management plans by developing a low cost precise erosion warning systems (GUI) with means of satellite remote sensing. 5DARE will integrate and synthesize project findings suitable for awareness raising, readily communicable to a wide audience, and relevant for policy negotiations. Furthermore, the project will maintain a dialogue with relevant stakeholders and will provide recommendations for policy makers

Project Impact on Society

The added value and impact to society that will be contributed by the proposed research is: a) promotion of scientific knowledge on the relationships of remote sensing products and climate change information with terrain gauges in terms of soil erosion processes, b) impact assessment of hydro-meteorological and climatological parameters of erosion processes, c) development of new methodologies for erosion modelling and forecasting, d) reduction of uncertainty of erosion phenomena forecasting in ungauged basins, e) upscaling of soil loss assessment results from local to regional level, and f) development of innovative observation and forecasting techniques in direct connection with local end users.

To me, H.F.R.I. funding would mean...

“

H.F.R.I. funding offers me the unique opportunity to set up a new research team to conduct top-level pioneering research. Through this funding, I will ensure the further development of both my own research skills, and the new fellow researchers who will accompany the research team. My goal is to create a team with coherence and vision that will successfully carry out all the research objectives of the submitted proposal. At the same time, my personal ambition is for the research team to engage in widespread networking with scientific "related" research teams both at national and international level, with the ultimate goal of securing future synergies that will ensure its sustainability

The Principal Investigator,
Dimitrios Alexakis

Funding

Amount: **198,980 €**

Duration: **36 months**

Foundation: **H.F.R.I.**

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

CONTACT

127, Vasilissis Sofias Avenue
115 21 Athens, Greece
info@elidek.gr
www.elidek.gr

HELLENIC REPUBLIC
MINISTRY OF DEVELOPMENT AND INVESTMENTS

GSRT
GENERAL SECRETARIAT FOR RESEARCH AND TECHNOLOGY