



MASTS PECRE Final Report: Dr. Tony Gutierrez

Host Institutions:

The University of Georgia
Department of Marine Sciences
Athens, GA, U.S.A.

University of North Carolina
College of Arts & Sciences
Chapel Hill, NC, U.S.A

Hosting Faculties:

Prof. Samantha B. (Mandy) Joye
Department of Marine Sciences
The University of Georgia
Athens, GA, U.S.A.

Prof. Andreas P. Teske
Department of Marine Sciences
University of North Carolina
Chapel Hill, NC 27599, U.S.A.

Background:

This fellowship aimed to study the microbiology of the North East Atlantic in relation to its capacity to degrade oil hydrocarbons in the event of a possible major oil spill in this region, and to draw parallels in this regard to the Deepwater Horizon oil spill that occurred on April 2010 in the Gulf of Mexico. This fellowship combined the experience of two eminent groups in the United States – the University of North Carolina at Chapel Hill and the University of Georgia in Athens – with the Fellow’s expertise and skillsets in studying the microbiology, biogeochemical processes and associated abiotic factors occurring in subsurface and deep ocean environments. This exchange has enhanced international collaboration between these US groups and MASTS, and generated novel ideas and approaches to the study of the natural attenuation processes that exist, and how they respond, in deep ocean environments, as well as how they may be harnessed to help oil-spill response authorities deal with maritime oil spills.

Interactions with the US hosts:

During this fellowship visit to the USA, the Fellow engaged with both US host institutions. This was not only confined to the two professors (Joye and Teske) who the Fellow was visiting, but he also interacted with other research groups at both institutions, such as with the group of Prof. Michael Aitken at UNC-Chapel Hill who is an expert in the application of DNA-based stable isotope probing to study hydrocarbon-degrading bacteria, and with also the group of Prof. William Whitman at UGA-Athens who is an expert microbial ecologist and bacterial taxonomist. The Fellow also interacted with the postdocs and postgraduate students of all these groups, and he also presented a departmental seminar at both institutions where he took the opportunity to talk about his research on oil spills, his future plans and how to integrate the US groups in this work. He also took the opportunity to introduce MASTS.

Outputs completed and expected:

1. Drawing parallels between oil spills in the Gulf of Mexico and NE Atlantic

During this fellowship, the Fellow discussed various ideas for grant applications in collaboration with Profs Joye (UGS, Athens) and Teske (UNC, Chapel Hill) together with the involvement of members from other MASTS institutions. Meanwhile, during this visit, the Fellow was able to draft an outline of some grant proposal ideas to exploring the microbial communities involved in oil-degrading processes in contrasting environments.

2. Microbial baseline

This exchange allowed the Fellow to learn new skills and approaches in developing a Microbiological Baseline in ocean systems. Importantly, such a baseline acts as a reference, which can be referred to for assessing and quantifying any changes that we observe. This experience has enhanced the research of the Fellow who currently has an ongoing project to developing a microbiological baseline for the NE Atlantic.

3. Enhancing postgraduate training

This exchange visit will enhance the opportunity of one of the Fellow's PhD students in gaining valuable insight and training from both US groups. For this, a visit is planned for the student to visit both US labs in 2015 in order to learn new skills in microbial molecular biology and bioinformatics.

4. Invited speaker

During his visit, the Fellow accepted an invitation to present his work at the 2015 Gulf of Mexico Oil Spill and Ecosystem Conference, special session on "Making a Living on Hydrocarbons: Diversity, Metabolic Potential, and Regulation of Microbial Hydrocarbon Oxidation".

5. Workshop

An oil-spill workshop is planned for late 2015 at Heriot-Watt where colleagues from these US groups and members of the MASTS community and elsewhere will be invited to address the concerns of deepwater oil exploration.

6. Proposals

NERC Standard Grant
EU Horizon-2020 bid

Future plans for building on the PECRE:

This research exchange has already led to significant developments with respect to applying for funding and writing up publications with both US groups.

Award size and expenditure:

Total award:	£3,700
Travel & Subsistence:	£3,120.32
Available:	£579.68