



INDEEP WG3 Workshop: Biodiversity and connectivity of deep-sea ecosystems in areas targeted by deep-sea mining

Swakopmund, Namibia, 11 – 21 April 2016



The extraction of phosphates from the marine environment has yet to commence anywhere in the world. However, it is of increasing international interest as a strategic reserve of agricultural fertilizer. Representatives from industry see this as a potentially lucrative proposition and are attempting to push forward with instigating their programmes in New Zealand (Chatham Rock Phosphate Ltd), Mexico (Odyssey Marine Exploration), Namibia (Namibian Marine Phosphates), and South Africa (Green Flash Trading & Diamond Fields International). Currently, a high level of scrutiny of the proposed phosphate mining activities is underway for each of the regions under consideration. The results of the Environmental Impact Assessment for both the projects in both New Zealand and Mexico have resulted in denial of licence applications for these projects by the relevant governmental environmental agencies (in February 2015 for Chatham Rock Phosphate Ltd and in April 2016 for Odyssey Marine Exploration), although appeals may well be forthcoming. In Namibia, a moratorium on phosphate mining has been in place since September 2013 and the governmental evaluation of the recent EIA is about to commence.

INDEEP scientists have been keeping abreast of the marine phosphate-mining situation worldwide and Namibia in particular, largely owing to links with our INDEEP colleague Mrs Bronwen Currie, a biologist in the Namibian Ministry of Fisheries and Marine Resources. We were fortunate enough to meet Bronwen during the 13th Deep-Sea Biology Symposium in NZ in 2012 (her attendance was enabled by the INDEEP-International Seabed Authority travel bursary award). It was during this meeting that our first discussions regarding a potential INDEEP capacity development effort in Namibia took place. Bronwen explained that despite the wealth of fisheries scientists in Namibia, there are almost no deep-sea benthic ecologists. This

poses a problem in light of the proposed mining. We subsequently collaborated with Mr Rudi Cloete of the Ministry of Fisheries and Marine Resources to hold a workshop in order to address this limited capacity in Namibia in terms of benthic and pelagic ecosystem effects of mining. The workshop would consider not only the fundamental principles of benthic ecology but also would address the main concerns of a variety of deep-sea anthropogenic activities. We secured funds from the INDEEP grant (funded by Fondation Total) and this was generously matched by funds from the International Seabed Authority. These funds enabled us to invite 28 participants from Namibia, Kenya, Madagascar, Mauritania and Angola to attend the workshop in Swakopmund at the National Marine Information and Research Centre of the Ministry of Fisheries and Marine Resources headquarters. Their experience spanned sectors and disciplines, although most were related to fisheries in some way, and included an Executive Director of the Centre of Studies and Development of Fisheries, Senior Fisheries Biologists, Head of Data Management, PhD Students, Fisheries Research Technicians and Research Scientists.

A diverse range of subjects was taught using a variety of methods. Participants were introduced to benthic environments and the associated fauna, the history of deep-sea exploration, animal-sediment interactions, human impacts, sampling and sampling design, metrics used in characterisation of the benthos, ecosystem function and services, life-histories, larval dispersal and connectivity, consideration of mining impacts, management strategies and governance. The teaching comprised a combination of lectures, hands-on investigations of benthic fauna (from meio to megafauna) including boat work, sample processing, laboratory observations, data analysis exercises, discussion groups and feedback presentations by participants. The course preparation was a dynamic process with adjustments made by the presenters each evening based on participant requirements in preparation for the following day. All participants were given access to the course presentations, associated key literature and webinar recordings. They were also given course participation certificates. Post-course evaluations were extremely positive, with the majority of participants eager to use their new knowledge in their current roles to varying degrees and to pass on this knowledge to their colleagues. In addition, it is hoped that benthic monitoring becomes incorporated into standard practices in Namibian waters alongside fisheries assessments. Others are now considering a change of career path in order to incorporate or even focus on benthic research. The enthusiasm of the participants was evident throughout and each one is now far more aware of how the benthic and pelagic ecosystems are interlinked and hence should be considered in any marine industrial impact assessments. The INDEEP presenters also gave feedback and each thoroughly enjoyed their experience of teaching in Namibia. The group worked well together and it is envisaged that this new network will be of use to many of the participants and presenters alike. It is hoped that some of the Namibia workshop participants may teach in future INDEEP capacity development efforts. Overall, this workshop was a great success.

The INDEEP course presenters were: Maria Baker (INDEEP/DOSI Lead, University of Southampton, UK), Bronwen Currie (Ministry of Fisheries and Marine Resources, Namibia), Ana Hilário (Univeristy of Aveiro, Portugal), Lisa Levin (Scripps Institution of Oceanography, USA), Anna Metaxas (Dalhousie University, Canada), Paul Tyler (University of Southampton, UK) & Verena Tunnicliffe (University of Victoria, Canada). The workshop participants were: Jean Jacques Be (Center of Studies and Development of the Fisheries, Ministry of Fisheries, Madagascar), Josephine Edward (MFMR, Namibia), Tobias Endjambi (MFMR, Namibia), Victoria Ndinelago (MFMR, Namibia), Silvana Faria (National Institute of Fisheries, Angola), Ernest Frans (MFMR, Namibia), Johnny Gamatham (MFMR, Namibia), Stephanus Hamutenya (MFMR, Namibia), Nandi Hjarunguru (MFMR, Namibia), Moses Kalola (MFMR, Namibia), Lessyn Kalwenya (MFMR, Namibia), Deon Louw (MFMR, Namibia), Erich Maletzky (MFMR, Namibia), Said Mohamed Hashim (University of Nairobi, Kenya), Sidi Mohamed (Mauritanian Institute of Oceanographic Research and Fisheries, Mauritania), Leevi Mwaala (MFMR, Namibia), Tomas Nalukaku (MFMR, Namibia), Ester Nangolo (MFMR, Namibia), Suama Niinkoti (MFMR, Namibia), Sarah Paulus (MFMR, Namibia), Allie Samuel (MFMR, Namibia), Malakia Shimhanda (MFMR, Namibia), Beatha Sikongo (MFMR, Namibia), Joseph Shikeva

(MFMR, Namibia), Ferdinand Hamukwaya (MFMR, Namibia), Vasani Tutjavi (MFMR, Namibia), Heidi Skrypzeck, (MFMR, Namibia), Beth Waweru (Kenya Marine and Fisheries Research Institute)



