1. **Name of Applicant:**

Dr Ronel Nel

2. **Names of Team Members:**

Even though this is an individual application it is necessary to recognize the contributions, support and encouragement from particular colleagues, collaborators and post-graduate students that have played a significant role in the success of all of these endeavors. Of particular importance are *Linda Harris, Karien Bezuidenhout, Jenny Tucek, Maggie Hawkins, Bernice Mellet, Anje De Wet, Eileen Campbell, Derek Du Preez, Andrew Leitch, George Hughes, Douglas Hykle, Herman Oosthuizen, Santosh Bachoo, Lorenz Hauser, and Kerry Naish.*

3. **Indicate the Award Category being applied for**

3.1.	NMMU Engagement Excellence Award	
3.2.	NMMU Engagement Excellence Team Award	
3.3.	NMMU Emerging Engagement Award	X

4. **Nature of the engagement activity/project**

Provide a brief summary of the engagement activity/project being reported on. The summary should provide details on the nature of the activity, its aims and objectives, the internal and external partners, and the expected outcomes. Also indicate which of the four engagement categories these activities are linked to i.e. Community Service and Outreach, Engagement through Teaching and Learning etc. (Maximum of 400 words)

Presented here is a collection of programmes that took place in 2012 that are focussed around *ecological sustainability and resource use*. Dr Nel is a marine biologist with particular expertise in beach ecology and sea turtle biology and conservation, and hence the activities presented are focussed around these themes. Three particular projects will be highlighted. Documentation will be included (as an appendix) to indicate the impacts of these events and other activities undertaken during 2012 that are related to these expertise and interest.

Engagement through Professional/Discipline-Based Service:
In June 2012, 60 delegates from 13 countries were hosted at Mpekweni to discuss themes around sandy beach ecosystems. This was the ***6th International Sandy Beach Symposium***, hosted only once previously in South Africa (30 years ago). Four international plenary speakers (sponsored by DEA) were hosted to ensure broad representation of disciplines. Four theme-specific workshops took place and their outcomes documented in manuscripts, the first of which has been accepted for publication (see Harris et al 2013 accepted ECSS).

In December 2012, representatives from 10 Western Indian Ocean (WIO) countries gathered at NMMU for the ***4th meeting of the Marine Turtle Task Force (MTTF,* chaired by Dr Nel).** The objectives were to review the work programme of the task force, and to identify sites of international importance for marine turtles to be included in a region-wide network. This was done through an expert review and scientifically robust, conservation planning process. Invited experts from four other countries were also present with guest presentations from Dr Girandot (an ecological modeller from France) and Dr Vousden from the ASLCME (Agulhas Somali Large Marine Ecosystems) Programme. Local conservation managers and government officials attended as a capacity building exercise on the very challenging topic of conserving migratory species. A total of 25 people were present from 14 different countries. The project was fully

sponsored by the IOSEA and United Nations Environment Programme.

Engagement through Research and Scholarship:

The third activity took place as a small contract under the IOSEA and Indian Ocean Tuna Commission (IOTC) to review ***the ecological risk of sea turtles in tuna and tuna-related fisheries***. Twenty populations of sea turtles across the entire Indian Ocean were evaluated in terms of their vulnerability to tuna fisheries. A novel approach was developed. The report was presented at the 15th meeting of the Scientific Council of the IOTC (Mahé, Seychelles) in December 2012 (attended by 60 delegates from 23 countries). This project was conducted with assistance from two NMMU students, a local consultant and four experts from international NGOs.

5. Assessment Criteria

Motivate stating how you meet the criteria for the award for which you are applying. Refer to the Assessment Criteria section of the application form above for the information you have to provide under each criteria.

5.1. Criteria 1

The impact and significance of the engagement activity.

The mission of NMMU is to be a dynamic ***African*** university, recognised for its ***leadership*** in generating ***cutting-edge knowledge*** for a ***sustainable future.*** The three primary activities featured here are of multi-national importance with a very strong east-African focus but also with local impact through raising awareness and building capacity of students and conservation authorities (in local and national government). Every activity speaks of leadership by taking the initiative of organising and chairing the international workshops and symposia, presenting NMMU to representatives from ~ 25 countries with ~20 nations visiting NMMU during the course of the year. In all instances the meetings presented the latest available scientific information, and created an opportunity for dialogue in the scientific community, leading to the development of new techniques (like setting conservation targets for sandy beaches) never previously attempted. A novel technique was also established to evaluate the vulnerability of marine turtles to artisanal and commercial fisheries. The central objective of the activities are to reduce the human footprint on sensitive ecosystems (sandy beaches) and endangered species (sea turtles) while sustaining the quality of life, and ecosystem goods and services derived from these assets. All of the activities were funded externally (DEA or UNEP) with very small financial contribution by the University (gratitude to CMR and Science Faculty).

5.2. Criteria 2

The intellectual endeavors contributed by the engagement activity.

The three activities featured (Sandy Beach Symposium, Turtle Task Force Meeting and the Ecological Risk Assessment) provided the opportunity for national and international scientists and conservation managers to present their own research and/or participate in designing new knowledge and approaches to ecosystems-based management. In particular –

The beach symposium was structured around themes (ecological patterns and processes, threats, conservation targets and management) which provided an opportunity to review the latest information on these topics but also to participate in a systematic conservation planning process,

never previously applied to sandy beach ecosystems. A PhD student (Linda Harris) prepared the format and jointly presented a series of workshops at the meeting. The first manuscript from one of these workshops has just been accepted for publication, presenting a framework to set conservation targets for beaches.

The turtle task force meeting brought together national focal points from 10 WIO* countries as experts to evaluate sites of potential international importance for the conservation, protection, and management of sea turtles. The intent of this process was to identify sites of particular ecological, but also socio-economic, cultural and educational value to be recognised by the international community. Recognising that expert opinion can be biased, a parallel scientific evaluation was conducted (using spatial planning software, MARXAN) to independently identify candidate sites for such an important network. It is the first time that this approach has been applied to a migratory species. A report was generated that will be presented at an International Conference in October 2013. The model will also be further developed in a post-doctoral project (by Dr Harris hosted by Dr Nel). The nomination of these 16 candidate sites is a diplomatic process now seated with each national representative, to be completed before the next signatory states meeting of the IOSEA (in 2014).

The Ecological Risk Assessment for turtle-fisheries interactions was challenging due to the lack of data especially in poorer countries or on the high seas. An existing framework, termed a Productivity-Sensitivity Analysis (frequently used to evaluate the impacts of fisheries on fish bycatch) was adapted to evaluate the risk of sea turtles being caught in tuna fisheries in the Indian Ocean. The process identified potential high-risk species (such as the South African leatherback turtles and their vulnerability to longline fisheries) but also healthy turtle stocks robust to (some) fisheries. The outputs provide an opportunity to prioritise conservation actions while minimising the penalties to fisheries. The project was presented to the Scientific Council of the IOTC (Indian Ocean Tuna Commission). Due to the success of the project, an additional small contract was subsequently awarded to apply the same procedure to turtle-fishery interactions in the Atlantic and Mediterranean Oceans (by ICCATT).

***WIO Countries**: Comoros, France (Reunion), Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa, Tanzania, United Kingdom. With the secretariat and other regional experts from Thailand, France (Paris), South Africa, Australia and USA.

5.3. **Criteria 3**

Communication and dissemination of knowledge and expertise.

The outputs of these projects have been across a range of media including technical reports, scientific publications, invited guest speakers, technical presentations, conference presentations, web-based articles, and email communications. (See attached power point for specifics and links to web-sites where these reports can be reviewed). Every attempt has been made to make information available to stakeholders and interested parties to ensure the widest possible dissemination of information.

These projects have also generated a new MSc and post-doctoral position, which both started in 2013.

The publications presented in the evidence folder often took place over a period longer than a year to get published due to the multi-disciplinary, multi-national scope of these events. There are more products in preparation.

5.4. Criteria 4

The strategic importance of the role performed by the individual/team.

It is reasonable to describe Dr Nel is an emerging national expert in sandy beach ecology, and a national authority and regional expert in sea turtle biology, conservation and management. Mostly international events are presented in this portfolio, focussed on the activities of the Western Indian Ocean Marine Turtle Task Force and the IUCN Marine Turtle Specialist group. Dr Nel has been the Chair and regional Vice chair (respectively) to these two committees for a number of years. However, it is also evident from the very close collaboration with national government (Department of Environmental Affairs/Directorate Oceans and Coasts) which was a sponsor to the Sandy Beach Symposium, and from the number of international delegations that Dr Nel was a part on behalf of South Africa (e.g. IBSA Oceans, Rio De Janeiro), that she is recognised as a leader in her field.

The responsibly in her capacity as (chair and) member to most of these working groups ranged from writing proposals to obtain funding, chairing local organising committees to host multi-national meetings, chairing meetings to meet specific objectives, and then write reports or publish the results in peer-review journals or online technical reports. The impact of these events range from informing governments, regional fisheries bodies and the scientific community of the impacts of activities (such as fisheries), highlighting the conservation status of species (e.g. endangered leatherback turtles) or to provide decision support to minimise impacts (e.g. setting conservation targets for beaches).

5.5. Criteria 5

The extent to which the engagement activities are acknowledged/recognized.

The activities featured range from representation (on behalf of NMMU or South Africa) at international meetings, as an invited expert at international meeting, focal point to the turtle task force (appointed by the government) and proxy to the national focal point (also appointed by the government). On an occasion Dr Nel represented the IOSEA Secretariat seated in Bangkok (an inter-governmental body). Dr Nel has also been co-opted onto a university "think-tank" to expand marine science at NMMU, and was part of a delegation to present the university to a selected number of institutes in Japan (including meeting the South African Ambassador in Tokyo). The acknowledgement of expertise and participation is therefore from within the university to the highest level of government, and intergovernmental level. Dr Nel thus operates on a unique platform, unavailable to most (young) academics.

5.6. Criteria 6

The integration of engagement into the core academic functions.

Integration with teaching and learning:

An addition to the expected teaching responsibilities (which include Marine Ecology to 3rd year students and Coastal Zone Management to 4th year students) Dr Nel, with the support of PhD student Karien Bezuidenhout and post-doctoral fellow, Linda Harris, present a 15-week Short Learning Programme (SLP) to the study-abroad students from St Benedict and St Johns

(Minnesota). The module presented as BIO373 – Introduction to Marine Biology in South Africa – provides an overview of the South African seascape and includes established principles of coastal ecology, as well as current issues (e.g. overharvesting) and management tools (conservation planning and marine protected area design). This programme aims to teach environmental awareness, which students can apply irrespective of their location.

Integration with research and scholarship:

The portfolio presented highlights the most direct outputs from the activities featured. These include published papers, technical reports, guest lectures and technical presentations (to be expanded on below). It also generated an MSc for 2013 and a post-doctoral fellow to continue the investigations on the questions attempted through short-term contracts (with IOTC and IOSEA).

5.7. Criteria 7

In the case of engagement through research and scholarship, the information referred to under Assessment Criteria (Criteria 7), where applicable needs to be provided.

There are two projects to be featured here; (i) the Identification of Sites of importance for sea turtles in the Western Indian Ocean (as a turtle task force activity) and the Ecological Risk Assessment of sea turtles interacting with tuna fisheries (as a collaborative project with students, consultant and international NGO). (The complete reports for both projects are attached).

i) Identification of sites of importance for marine turtles in the Western Indian Ocean

Dr Nel was part of an inter-sessional working group that drafted the evaluation criteria for the international network of sites of importance for sea turtles (under the international instrument, the Memorandum of Understanding for the conservation of marine turtles and their habitats in the Indian Ocean South East Asia region, spanning 40 countries). Even though there was significant support for the network, there was significant concern on the representivity of the network sites. It was realised that marine spatial planning approaches and conservation software, such as MARXAN, can assist in integrating competing spatial objectives (i.e. fisheries and livelihoods vs protecting turtle habitats vs cyclone tracks). The idea was presented to the IOSEA Secretariat, which was met with great enthusiasm but realised that is should include regional experts and participation. In September 2012, data templates were forwarded to the focal points of the regional task force soliciting their contribution and input.

The data were collated and verified during the workshop, which also provided the opportunity for expert discussion across all sites and all sea turtle populations hosted in the Western Indian Ocean. A total of 16 sites were identified (by experts) based on their ecological, socioeconomic or cultural value. Additional data were obtained from online and published sources outlining turtle habitats, size of populations, threats at these sites, spatial distribution and the economic use of the sites. A quantitative process (by Dr Harris) was conducted to overlay these spatial features and find the optimum scenario in which conservation targets can be met while allowing human use. This was an important objective as many of the WIO nations are poor but have ecological assets that they are dependent on. These sites were then compared to the sites identified by experts. The most important combination of sites were identified (in the report attached) and it is up to each of the countries hosting these sites to complete the diplomatic process of nominating the sites to the international community.

The report from the meeting including the expert consultation process and scientific process is

presented online (at www.ioseaturtles.org) which is the international convention's website. It will also be presented at the Western Indian Ocean Marine Science Association's symposium in Maputo, Mozambique in October 2013. The project also highlighted the need for further development of the tool (marine spatial planning) as it tends to be habitat-based, whereas the project is applying the approach on a species level. This can make a significant international contribution to the management of migratory species, and hence Dr Harris has been awarded an NRF Post-doctoral fellowship to develop this idea/concept/tools further over the next two years.

ii) Ecological Risk Assessment of sea turtles in the Indian Ocean interacting with tuna fisheries managed but the IOTC.

In August 2012, after an international call for expertise, a small contract was awarded to Dr Nel from the IOTC and IOSEA secretariats. With very ambitious terms of reference and a very short timeframe, the project commenced by co-opting additional technical and fisheries expertise to assist with the deliverables. A call was sent to the cooperating contracting (and non-contracting) parties of the IOTC requesting data on fisheries-turtle interactions. With data received from only four countries, on one gear type, an alternative approach was required to evaluate the impacts of fisheries on sea turtles in the Indian Ocean. After sourcing data from the internet on turtle distributions, nesting sites, and estimated fisheries catches, a framework to assess fisheries impacts was developed specific to sea turtles. This was conducted through an informal internet-based working group in collaboration with partners from the IUCN Marine Turtle Specialist Group. This method projects the relative turtle population productivity against the susceptibility to being caught in various fisheries gear types, creating an overall vulnerability score. A total of 20 turtle populations were assessed for three gear types with recommendations on how to adapt the fisheries to be more turtle-friendly. The report was presented to the Scientific Council (in Seychelles) and will be presented to the IOSEA Signatory States in 2014 (date and venue still to be confirmed). The report was posted online as part of the meeting report (IOTC-2012-SC15-INF09-Rev_1). Due to the data scarcity, Dr Nel volunteered to continue with the project in 2013 to source more data, and has subsequently designed an MSc to test the framework through a sensitivity analysis, and review more fisheries. A peer-reviewed paper is in preparation, outlining the procedure and findings of the small contract.

It has to be noted that the sandy beach work (from the 6th International Sandy beach Symposium) yielded fantastic outputs largely to the expertise of a PhD student (Harris) to which Dr Nel was the promoter. This project was initiated because the 2004 National spatial biodiversity assessment disregarded sandy beaches as unique ecosystems. In collaboration with SANBI (and Prof Eileen Campbell and others), an ecosystem-based spatial conservation plan has been designed that has been incorporated into the new spatial assessment and into coastal plans. The workshops at the beach symposium contributed directly to the student's PhD and so to national conservation management strategies.

6. Contacts

Provide the names and details of internal and external stakeholders/partners that can be contacted.

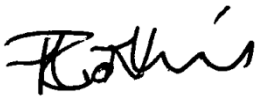
Internal:
Prof Eileen Campbell (Eileen.Campbell@nmmu.ac.za)
Prof Graham Kerley (Graham.Kerley@nmmu.ac.za)
Dr Derek Du Preez (Derrek.DuPreez@nmmu.ac.za)

External:
Mr Douglas Hykle, IOSEA Secretariat Bangkok (iosea@un.org)
Dr George Hughes, Ex-CEO Ezemvelo (george.hughes@iuncapped.ac.za)
Mr Herman Oosthuizen, DEA (Oosthuiz@environment.gov.za)

7. Attach a Portfolio of evidence and supporting documents linked to the above criteria

See portfolio attached with documents 1 – 14.

8. Please confirm that all the information provided is correct by signing your application



Dr Ronel Nel
Name: Signature: