The Rufford Foundation
Final Report

Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Fru Azinwi Nche-Fambo
Project title	Diversity and variability of microplankton community structure in KwaZulu-Natal estuaries
RSG reference	16448-1
Reporting period	Final
Amount of grant	£4991
Your email address	fruazinwi@gmail.com
Date of this report	16th of November 2015.

1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Bi-weekly sampling			yes	Neap tide bi-weekly sampling of all sites at both estuaries was achieved.
Physico-chemical data		yes		A good data set of the physico-chemical environment of both systems has been recorded. When closed, the Mdloti estuary was fresh with salinities 0.31-3.82, mostly anoxic [Dissolved oxygen (DO)], 0.42-9.12 mg/L and not very turbid (0.4-9.8 NTU). When open, the Mdloti was brackish (1.98-26.44) and oxygenated (6.09-11.6 mg/L) Whereas, the Mlalazi estuary was marine to brackish (6.33-35.53), oxygenated and more turbid (4.3-40.7 NTU). However, analysis of nutrient samples is still pending due to equipment failure in the department.
Diversity of microplankton and indicator species.		yes		Diatoms, green algae, cryptophytes, dinoflagellates and cyanobacteria were recorded in both estuaries. It is expected that the diversity per estuary would be different as the environmental variables most of which drive microplankton growth and diversity (such as salinity, dissolved oxygen) differed per estuary. At the moment, not all microplankton samples collected have been microscopically analysed. Hence indicator species have not yet been finalised as well. However, at the Mdloti estuary, the cyanobacteria (*Anabaena* sp.) dominated when conditions were very anoxic (<3mg/L dissolved oxygen) and the dinoflagellate (*Prorocentrum* spp.) mostly dominated at the Mlalazi
Community structure of microplankton.		yes		Cyanobacteria, cryptophytes and green algae dominate at the Mdloti estuary while diatoms and dinoflagellates dominate at the Mlalazi. A localised *Prorocentrum redfieldii* bloom was

				recorded the mouth Mlalazi on the 10th of June 2015.
Microplankton driving parameters		yes		Nutrient analysis is currently being carried out. As this is one of the key factors in microplankton growth, analysis on parameters driving microplankton diversity and community has not yet been finalised. Hence indicator species and water quality has not been finalised either.
Variability of microplankton community		yes		Within an estuary, microplankton varied specially and temporarily with different species dominating at different sites of the estuary on the same day. For instance, at the Mdloti, green algae and cryptophytes mostly dominated in the mouth of the estuary while cyanobacteria dominated at head of the estuary. Also, different species dominated on different sampling dates.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

1) After the 12months of sampling, the temporarily open/closed (TOCE) Mdloti estuary did not breach as expected. Hence the sampling programme was extended for a further 2 months to include an open phase occurring after the planned sampling period. This was in order to investigate the growth and change in microplankton communities during and after a mouth opening event which was initially one of the projects objectives.

2) The electric motor used for the boat to sample at the Mdloti estuary broke and we had to change to a petrol motor. This led to extra cost on fuel that was not initially budgeted for.

3. Briefly describe the three most important outcomes of your project.

As of now,

1) Biweekly sampling was accomplished and a good data set on the environmental parameters of both systems was recorded.
2) Both estuaries showed differences in environmental variables most important of which was dissolved oxygen concentration. These differences in environmental variables also differed along the estuarine length.
3) Microscopic analysis so far has shown that both systems have different microplankton community structures which differ spatially from the mouth to the head of the estuary and vary with time as well.

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

Although local communities were not involved, Ezemvelo KwaZulu-Natal (EKZN) Wildlife will benefit from the dataset for management purposes.

5. Are there any plans to continue this work?

The field aspect of the project for which I solicited funds for has been accomplished. A monitoring plan would be set up at the end of the project. This would inform management ideas for both systems.

We would therefore like to continue monitoring the system based on the new monitoring plan proposed by this project. This work complements monitoring and management by EKZNW and DWA

6. How do you plan to share the results of your work with others?

The results of the work would be published in peer review journals. It would be reported as talks and posters in conferences. Also, the Ezemvelo KwaZulu-Natal (EKZN) Wildlife and the Department of Water Affairs (DWA) would be given copies of the reports from this project. These two bodies (EKZN and DWA) manage the estuarine systems in KwaZulu-Natal, South Africa.

7. Timescale: Over what period was The Rufford Foundation grant used? How does this compare to the anticipated or actual length of the project?

The Rufford Grant was used over a period of 1 year. It funded most of the field work for this project. The actual length of this project is 2 years. One year for field work (which has been completed) and another year for lab work, statistical analysis and write ups (which is currently ongoing).

8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Transportation to estuary	2329	2329	0	
Fuel for boat	545	609.4	64.4	The electric motor used at the Mdloti estuary broke and we had to use a petrol motor hence increase

				in the actual amount spent
Whatmann Glass Fibre Filter paper	695	695	0	
2.0µm Milipore filter paper	575	575	0	
20 µm Nitex filter paper	646	646	0	
Consumables	201	201	0	
Total	**4991**	**5055.4**	**64.4**	The local exchange used is 1£=R17.618

9. Looking ahead, what do you feel are the important next steps?

The most important next steps are to complete the microscopic analysis, identify the driving parameters for microplankton community structure and identify indicator species for water quality monitoring.

10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

As of now, I have not produced any materials related to this project. However, The Rufford Foundation logo will be used on all posters and reports, and the foundation acknowledged in all publications.

11. Any other comments?

This project relied on the availability of funds for the frequent fieldtrips to properly investigate microalgae as they have a very short regeneration period of hours to days. This project would therefore not have been adequately carried out without the funding awarded by the Rufford Small Grant Foundation. Without this funding, the data generated would have an inadequate temporal resolution hence would not be valuable in deciding a monitoring plan or give management advice which is one of the aims of the project. We are therefore immensely grateful for the funding.