

## The Rufford Small Grants Foundation

### Final Report

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

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. 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. 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](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

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Grant Recipient Details	
Your name	Julia K. Baum
Project title	Fishing and Climate Change Impacts on the World's Largest Atoll, Kiribati
RSG reference	17814-2
Reporting period	July 2015-July 2016
Amount of grant	£5000
Your email address	<a href="mailto:juliakbaum@gmail.com">juliakbaum@gmail.com</a> , <a href="mailto:baum@uvic.ca">baum@uvic.ca</a>
Date of this report	July 15, 2016

**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
1. Socioeconomic Monitoring	✓			<p>We were not able to conduct this component of our research unfortunately because of a major outbreak of Chikungunya on the island. We began the work, but almost immediately my Research Assistant Lisa Szostek contracted Chikungunya, and had to return to Canada. Thereafter, I did not pursue this land-based work because it was unsafe for my team to do so for fear of others contracting the virus. The outbreak appeared to be better contained when we were most recently on Kiritimati (spring 2016; funded separately) and I anticipate that we will be able to resume our socioeconomic surveys in our next expedition (summer 2017).</p>
2. Coral Reef Ecosystem Monitoring			✓	<p>We conducted all types of our proposed monitoring: underwater visual censuses of fishes and urchins, photographs of small benthic photoquads and permanent mega-photoquads (MPQs), water quality samples and measurements.</p> <p>We also were able to establish 20 new MPQs at sites around the island, so that our 10 focal sites with MPQs now each have three MPQs instead of just a single one. This will greatly strengthen the ecological inferences we can make. In addition, we adopted a new methodology for our MPQs called Structure-from-Motion (SfM) photography, which will allow us to fully characterise reef structure and diversity.</p>

3. Conservation Outreach: a) Participatory Research	✓			Because of the Chikungunya outbreak, we were unable to conduct the participatory research we had planned (see above). We did, however, still meet in person multiple times with our main contacts at the Ministry of Fisheries and the Ministry of Wildlife/MELAD. The latter has a new local head of the Ministry, and she was very welcoming and receptive to the work we are doing. We are arranging to do a presentation and discussion group with MELAD employees on our next trip.
b) Conservation education		✓		Again, because of the Chikungunya outbreak, we were unable to conduct the conservation education activities we had planned.  I was able to conduct some outreach during my spring 2016 expedition, namely presenting to a new Climate Change Youth Group at one of the churches in Ronton, Kiritimati about coral and El Niño. We had an excellent discussion and I plan to present again to them on my next trip.
c) Aquarium trade safety and sustainability	✓			We met multiple times with the owners of the two aquarium fish companies we are connected with to discuss future possibilities for dive training. To date, we are having trouble nailing down dedicated funding for this endeavour.
d) Papers			✓	We produced two 2015 Research Reports for the Kiribati government (both attached with this report) and two peer-reviewed papers from this project (Watson et al. 2016, Robinson et al. 2016). We took printed copies of these reports and papers with us to Kiritimati this spring (and shared them with all of our contacts), and we mailed colour printed copies of them to our contacts at the Ministry of Fisheries and MELAD in Tarawa (the capital of Kiribati).

e) Global media communications			✓	<p>We shared our research broadly on Facebook and twitter (@baumlab, &gt;2500 followers total) and on my lab websites (baumlab.weebly.com; kiritimati.weebly.com). We also wrote blog posts about our spring 2016 expedition: <a href="http://baumlab.weebly.com/lab-blog">http://baumlab.weebly.com/lab-blog</a></p> <p>In addition, our expeditions to Kiritimati over the past year garnered much media attention including articles in the Associated Press and Washington Post, television and radio interviews (see: <a href="http://baumlab.weebly.com/2016-media-coverage.html">http://baumlab.weebly.com/2016-media-coverage.html</a> and <a href="http://baumlab.weebly.com/2015-media-coverage.html">http://baumlab.weebly.com/2015-media-coverage.html</a>), vastly raising the profile of our project there.</p>
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**2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).**

The two difficulties that arose were the Chikungunya outbreak, which prevented us from doing land based work in the summer of 2015, and rough weather at times in both our summer 2015 and 2016 field seasons, which was related to the intense El Niño. Despite these obstacles, we had a great, hardworking and experienced team and we were able to still conduct a great deal of high quality research and outreach.

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

**a) Ecological monitoring.** We collected a fifth round of ecological survey data at our permanent monitoring sites: this data is proving to be a treasure trove of information for understanding how climate change is impacting coral reefs. The 2015-2016 El Niño event has caused the greatest coral bleaching around the world on record, and Kiritimati is the second hardest hit area on the planet (after nearby Jarvis Island). Thus, my long-term monitoring data is proving very important for characterising exactly how the reef ecosystem is impacted by these intense heat events.

We are now completing analyses of all of our benthic photo data (from all years) and we will be analysing it and writing it up for publication in the near future to

document the intensity of coral bleaching and mortality around the atoll, and how these vary by species and by area of the atoll.

**b) Conservation Education.** As noted above, I presented to a Climate Change Youth Group. The community leader organising the group was very receptive to me and my team and we are making plans for future activities we can do together including radio interviews and community beach clean ups. I believe this connection is instrumental for starting to educate the local communities about coral reef conservation.

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

As detailed in the table and Conservation Education text above. At this stage, having conducted 11 expeditions to Kiritimati over the past 8 years, my team and I have strong local connections with local communities, businesses, and government. Assuming the Chikungunya virus remains under control, we will continue to build on these connections and on community involvement in our future trips.

**5. Are there any plans to continue this work?**

Yes. I feel deeply committed to Kiritimati (both the people and the environment) and I plan on continuing my work there for the foreseeable future. I plan on returning to Kiritimati next summer (July/August 2017). I would like to apply for a Rufford Booster Grant that would support our household surveys and conservation education activities in summer 2017, that would focus on the how the El Niño impacted peoples health and livelihoods and to discuss climate change adaption measures that could be put in place.

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

We have shared all of our results to date with the local government on Kiritimati (Ministry of Fisheries, Ministry of the Environment) through in person meetings and with copies of our research reports and publications; we also send our research reports and publications to the federal Government of Kiribati in Tarawa. We will continue to do so: writing up a 2016 Research Report this fall.

My team (Danielle Claar, Jamie McDevitt) and I gave three talks on this work at the International Coral Reef Symposium (ICRS) in Honolulu, July 2016. I also presented this research at the University of Miami in April 2016, at Yale University in November 2015, and here at UVic in October 2015.

We are currently preparing three publications for publication in peer-reviewed journals from this work.

Lastly, we share our work via social media on Twitter and Facebook: @BaumLab, which now has >2500 followers and on our websites and blogs.

**7. Timescale: Over what period was the RSG used? How does this compare to the anticipated or actual length of the project?**

Preparation & planning: April – July 2015;

Work on Kiritimati: I used the RSG funding over our 4-week trip to Kiritimati in July and August 2015. The actual length of the field trip is the length that we anticipated.

Data analysis and write-up: September 2015 – ongoing. We are continuing to analyse data and prepare reports and publications from the data we collected, using my faculty salary and my students' scholarships as support for this work. We anticipate have three manuscripts submitted within the next 3 months.

The actual timescale of the project is as expected, with the exception of the final manuscripts.

**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
Flights (to/from Kiritimati via Honolulu) for JB, LS	£2190	£1448	+£742	Flights were cheaper than anticipated
Kiritimati food/lodging (Dive Kiribati USD\$55/person/day X 2 X 28 days)	£2094	£3237	-£1143	Dive Kiribati had deteriorated significantly and was no longer a safe place to stay. We relocated to Ikari House at considerable extra expense, but the

				lodging is now clean and safe.
Household survey and outreach supplies	£200	£115	+£85	This was cheaper than budgeted
Lodging/transportation in Honolulu 1 night	£160	£154	+£6	-
Team research permit and exit taxes	£185	£185	£185	-
Shipping equipment/excess luggage charges	£170	£272	-£102	This was more expensive than anticipated
<b>TOTAL</b>	<b>£4999</b>	<b>£5353</b>	<b>-£355</b>	

I had to cover the additional costs from my overall lab operating grant, and then raise additional funds for our other research.

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

The most important next step ecologically will be to assess how Kiritimati's coral reefs start to recover from the incredible heat stress and coral mortality (~85% island wide) during the 2015-2016 El Niño.

I would also like to use our expedition next summer to strengthen my ties with the local government and communities, to encourage them to think about and take initial steps toward coral conservation in light of fishing pressure and climate change. To do so, I will build on my relationships with local community leaders and government. I have also applied for funding that would allow me to travel to the capital of Kiribati (Tarawa) to meet with government there to discuss conservation options for Kiritimati. Important next steps are to determine what conservation policies might be feasible on Kiritimati, both in terms of fisheries resource management and climate change adaptation.

I would also like to expand our conservation education efforts in the schools i.e. by developing materials for the high schools, and by hiring local high school students to work with us as interns. Successful community engagement would also involve communicating our results and recommendations through the radio and church presentations.

Overall, I would like to start reaching out to conservation NGOs with the goal of engaging one of them to start work on Kiritimati. There is a great need for sustained

and focused conservation effort on Kiritimati, and the additional help of an eNGO could be highly beneficial.

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

Yes. The RSGF logo is posted on my lab website, and has been shown (as an acknowledgement to our RSGF funding) on all talks about this research. We also acknowledged Rufford in tweets last year.

**11. Any other comments?**

I am grateful for Rufford's continued support of my project on Kiritimati, and look forward to continuing this work next year.