

Impact case study (REF3)

Institution: University of Lincoln		
Unit of Assessment: 14 – Geography and Environmental Studies		
Title of case study: Moana Water of Life: Navigating Climate Change for Planetary Health		
Period when the underpinning research was undertaken: Jan 17 – Jul 20		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
HANNA Edward	Professor	23 Jan 17 to date
KYTHREOTIS Andrew	Senior Lecturer	5 Nov 18 to date
MACKLIN Mark	Distinguished Professor	1 Sep 16 to date
MERCER Theresa	Senior Lecturer	5 Nov 18 to date
Period when the claimed impact occurred: Aug 19 – Jul 20		
Is this case study continued from a case study submitted in 2014? N		
1. Summary of the impact (indicative maximum 100 words) Governments around the world are struggling to tackle climate change, with predominantly top-down approaches that have limited opportunities for citizens to engage in and influence policy change. To address this challenge – grounded in established expertise in the science of climate change – researchers from Lincoln are exploring ‘Citizen Social Science’ as a way to bring citizens and experts together to co-produce both climate research and policies that build on citizens’ values, knowledge and experiences. Whilst limited by Covid-19, this combination of research has already influenced local climate policy, enhanced knowledge and awareness of the role citizen social science can play in tackling climate change, and informed climate conversations around the globe, through the communities of the Anglican Church.		
2. Underpinning research (indicative maximum 500 words) The Fifth Assessment Report prepared by the Intergovernmental Panel on Climate Change states that the warming of the climate is unequivocal and that human influence on the climate is clear. However, despite this report being published in 2014, existing government policy approaches around the world are struggling to limit global temperatures below the 1.5 to 2°C Paris target. The predominantly top-down policy approaches are being called into question, not least by the recent school climate strikes, widespread public protests and declarations by public bodies at all levels of climate emergencies. Research at the University of Lincoln aims to address this policy challenge, by combining expertise in climate science with new research on the benefits of ‘citizen social science’. Professor Edward Hanna is globally recognised for his research on ice-sheet mass balance and consequences for global sea-level rise (Section 3:1,2,3). By examining the meltdown rates of the Greenland and Antarctic Ice Sheets, the work of Hanna’s team has demonstrated the necessity to limit global warming to 1.5°C above pre-industrial levels in order to avoid potentially catastrophic tipping points. Professor Mark Macklin has conducted pioneering research into flood risk under changing climate based on new long reconstructions from sedimentological archives (Section 3:4). As well as being directly relevant for millions of people in low-lying coastal communities including Lincolnshire and Polynesia, who are directly affected by rising sea levels and floods and connected (through the Moana: Water of Life conference) in the impact work below, these findings have informed the work of other members of the research team, who are exploring why existing climate mitigation and adaptation policy approaches are not working and are therefore working on identifying potential alternatives. Dr Kythreotis’ and Dr Mercer’s research into climate policy responses has found that traditional top-down climate change policies have limited citizen agency and disregard citizen’s concerns, values and goals for their communities. This has led these researchers to propose the		

alternative approach of 'citizen social science', as a way to more directly engage members of the general public, and especially young people, in mitigating and adapting to future climate change. The model brings citizens and experts together to work collaboratively to co-produce climate research and policies that build on citizens' values, knowledge and experience and highlights the vital role of engaging ordinary members of the public in finding solutions to problems posed by human-induced climate change. The findings also identify ways to overcome existing barriers to effective citizen action by promoting local climate-change issues with scientists and policymakers. [Section 3:5,6]

Taken together, this body of research creates a powerful platform for impact, grounding citizen social science strongly in recognised climate science expertise and presenting alternative approaches for effective climate action.

3. References to the research (indicative maximum of six references)

- 3.1 Pattyn, F, C. Ritz, E. Hanna, X. Asay-Davis, R. DeConto, G. Durand, L. Favier, X. Fettweis, H. Goelzer, N.R. Golledge, P.K. Munneke, J.T.M. Lenaerts, S. Nowicki, A.J. Payne, A. Robinson, H. Seroussi, L.D. Trusel, M. van den Broeke (2018) The Greenland and Antarctic ice sheets under 1.5°C global warming. *Nature Climate Change* 8, 1053-1061.
<http://dx.doi.org/10.1038/s41558-018-0305-8>
<https://www.nature.com/articles/s41558-018-0305-8>
- 3.2 Hanna, E., F. Pattyn, F. Navarro, V. Favier, H. Goelzer, M. van den Broeke, M. Vizcaino, P. Whitehouse, C. Ritz, K. Bulthuis, B. Smith (2020) Mass balance of ice sheets and glaciers – progress since AR5 and challenges. *Earth Science Reviews* 201, 102976.
<https://doi.org/10.1016/j.earscirev.2019.102976>
<http://dro.dur.ac.uk/29314/> and later: <https://www.journals.elsevier.com/earth-science-reviews>
- 3.3 Hanna, E., J. Cappelen, X. Fettweis, S.H. Mernild, T.L. Mote, R. Mottram, K. Steffen, T.J. Ballinger, R.J. Hall (2020) Greenland surface air temperature changes from 1981 to 2019 and implications for ice-sheet melt and mass-balance change. *International Journal of Climatology*
<https://doi.org/10.1002/joc.6771>.
- 3.4 Longfield, S.A., Faulkner, D., Kjeldsen, T.R., Macklin, M.G., Jones, A.F., Foulds, S.A., Brewer, P.A. and Griffiths, H.M., (2019). Incorporating sedimentological data in UK flood frequency estimation. *Journal of Flood Risk Management*, 12(1), p.e12449.
<https://doi.org/10.1111/jfr3.12449>
- 3.5 Kythreotis, A., C. Mantyka-Pringle, T.G. Mercer, L.E. Whitmarsh, A. Corner and J. Paavola, C. Chambers, B.A. Miller, N. Castree (2019) Citizen Social Science for more integrative and effective climate action: a science-policy perspective. *Frontiers in Environmental Science* 7 (10).
<http://dx.doi.org/10.3389/fenvs.2019.00010>
<https://www.frontiersin.org/articles/10.3389/fenvs.2019.00010/full>
- 3.6 Kythreotis, AP & Mercer, TG (2020) Education as a new urban civil politics of climate change. In Castán Broto, V, Robin, E & While, A (2020) *Climate urbanism: towards a critical research agenda*. Palgrave Macmillan, London.
<https://www.palgrave.com/gp/book/9783030533854#aboutAuthors>

4. Details of the impact (indicative maximum 750 words)

The team's research into Citizen Social Science demonstrates that bridging the gap between citizens and young people with scientists, policymakers and other experts, enables better-informed decision-making that can positively influence policy and its implementation at local to global levels. Grounded in globally recognised climate science expertise, the team has used its

research to influence local policy decisions, enhance knowledge and awareness of the role that citizen social science can play in tackling climate change, and inform climate conversations around the world.

Influencing local policy decisions

A collaboration between the City of Lincoln Council, Siemens, Transition Lincoln and the team of researchers at University of Lincoln has led to establishment of the new Lincoln Climate Commission (LCC, <https://www.lincolncclimate.org.uk/>), co-founded by Kythreotis and advised by Hanna and colleagues. Since being launched in 2019, the Commission has drawn directly on research presented by the University of Lincoln research team – both on climate change and flood risk and on citizen social science – to lobby the City Council to adopt a net zero carbon target by 2030, as well as thinking of new ways to make a more climate-resilient Lincoln, both of which have been successfully incorporated into council policy. As Lincoln City Council Leader, Councillor Metcalfe, has said, *“As LCC Chair, I feel that the scientific evidence and expert judgement presented by University of Lincoln researchers, including recent research results on climate change and flood risk by Profs. Hanna and Macklin and “citizen social science” led by [Dr. Kythreotis], has influenced the City Council in adopting a net zero carbon target by 2030, as well as thinking of new ways to make a more climate resilient Lincoln.”* [5.1] Kythreotis has also liaised with the Place-Based Climate Action Network (<https://pcancities.org.uk/>), resulting in the LCC becoming one of just eleven full members of the UK network of PCAN climate commissions.

The team’s research also influenced the development of the Diocese of Lincoln Environmental Policy, launched by the Diocese of Lincoln on 1 September 2019 as part of our co-run Moana Conference. The Rt. Revd. Dr. David Court, Acting Bishop of Lincoln, wrote that “The University of Lincoln was consulted and excellent sense checking provided through the expertise of Professor Edward Hanna and Rebecca Forster who supported the writing of the policy Introduction and refining of the twelve goals...Learning from [the] Moana [Conference] has resulted in carbon footprint questions being integrated into planning of further diocesan events and hospitality.” [5.2].

Enhancing knowledge and awareness of the role citizen social science can play in tackling climate change

Drawing on our collective research, and working in collaboration with Bishop Grosseteste University and local representatives of the Church of England – for whom limiting the impacts of anthropogenic climate change is essential to their faith – the research team was approached in 2018 by the then Bishop of Lincoln (via the UoL DVC Prof. Toby Wilkinson) to co-organise and host an international conference on addressing human-induced climate change, called *“Moana Water of Life? Navigating Climate Change for Planetary Health”*. BGU were co-organisers of the conference and resulting book [5.3]. The conference, held in August/September 2019, brought together around 150 diverse stakeholders from the UK, USA, Polynesia and New Zealand, including physical and social scientists, religious leaders, ‘green’ businesses, students and members of the general public. As well as exploring the new model of citizen social science with this diverse group of participants, the conference also focused on engaging with the delegates and their views on the issues. The team used questionnaires, a ‘conversation wall’ and a photographic art exhibition by Project Pressure (www.project-pressure.org) to prompt delegates to question their preconceptions on how they deal with climate risks to planetary health and individuals’ lifestyles. This is evidenced by quotes from participants including: *“What all the presenters have shared has challenged the churches that it is time to work together to combat climate change...we are here to try to save the world”*; *“A lot of ideas and influences for the ongoing work with a climate strategy for the church of Sweden”*; *“I am a primary teacher and have been inspired to do more work with the children around making connections with, and having respect for, our planet.”*; and *“I have remembered why I embarked on this journey in the first place”* (Conference feedback sheets, [5.4]). These quotes bolster the concept of Citizen Social Science as a tool to engage disparate and diverse communities, including major religious organisations, in addressing the climate emergency. Further conference feedback includes: *“The Moana: Water of Life conference was distinctive in many ways...One singular trait that*

stands out, with the perspective of time and geographical distance, was the way the conference conversation revealed the multi-faceted nature of climate change/emergency, that scientists, faith-motivated individuals and members of the local community can interpret climate change in vastly different ways, yet reach the same conclusions concerning the urgency for addressing our planet's needs, for humankind and the planet. This melding of very different voices and perspectives was rich and multi-layered, and the cross-over of these worlds, and the conversations that we had, were truly unique in space and time." [5.5]. Dr. Emily Colgan (Trinity Theological College) wrote *"The Moana: Water of Life conference (and the subsequent publication)...was groundbreaking...it was a huge privilege to participate in this project and the ripples of this work continue to spread and impact communities around the world" [5.6].*

Informing climate conversations around the globe, through the communities of the Anglican Church

The connection with the Anglican Community came through the "Moana Water of Life..." Conference, creating an opportunity for the team's research to reach into one of the biggest global communities of more than 85 million people worldwide. The conference was cited as an 'example of good practice' in the General Synod GS 2159 "Climate Emergency and Carbon Reduction Target" background paper to the February 2020 Church of England policy to adopt a Net Zero Carbon emissions target of 2030, relative to a much more conservative and arguably inadequate original target date of 2050. The Rt. Rvrd. Dr. David Court, Acting Bishop of Lincoln, wrote: *"The reasoning for the policy update referenced our learning from Moana conference...It is likely that the shared knowledge for Moana contributed to the receptiveness of ambition within this vote."* The Metanoia Festival Organising Committee wrote that *"without Moana, Metanoia [Festival, to be held in Grantham in October 2021, <https://trinitygrantham.weebly.com/updates/metanoia-climate-festival-dates>] would not have happened, the influence of the Moana Conference has already been significant" [5.7].* Following the conference, Hanna co-edited a resulting first-of-its-kind book, "Science, Faith and the Climate Crisis" (Emerald; June 2020) which uniquely explores the climate science-faith interface. This book brings together conference contributions with reflections by leading academics (including a chapter by Mercer and Kythreotis on Citizen Social Science), religious leaders and other conference delegates and with a foreword from the Archbishop of Canterbury (Justin Welby), who also opened the Conference. In his Foreword, Archbishop Welby wrote: *"This book illustrates how when different voices are listened to carefully, new perspectives, opportunities and solutions can begin to be found" [5.3].* The team has been able to use this book and a resulting online brochure available at <https://www.lincoln.ac.uk/home/media/responsive2017/collegeofscience/schoolofgeography/research/Science,,Faith,and,the,Climate,Crisis.pdf> to encourage and provide materials for churches to lobby their congregations and governments for meaningful action on climate mitigation and adaptation, with a focus on using the scale of the Anglican community to effect change. For example, Bishop Marc Andrus, Bishop of the Episcopal Diocese of California, has added the book to a list of climate action resources shared with a group of about sixty climate-conscious bishops of the Episcopal Church in the USA. Bishop Andrus has said *"Given the monumental, indeed unprecedented scale of threat posed by human-caused climate change, the Lincoln University led conference ranks high on my list of responses...Science, Faith and the Climate Crisis provides insights and information that can help this global body of religious leaders [attendees of the next Lambeth Conference – decadal meeting of global archbishops] engage the climate crisis more effectively." [5.8]*

While progress has been slowed by Covid-19, which has pushed back the timing of the Lambeth Conference by two years to summer 2022, the impact outlined above has made our team determined to continue its work on the role that citizen social science can play in dealing with climate risks.

5. Sources to corroborate the impact (indicative maximum of 10 references)

- 5.1 Testimonial letter from Councillor Ric Metcalfe, Leader of Lincoln City Council.
- 5.2 Testimonial letter from The Right Revd Dr David Court, Acting Bishop of Lincoln.

- 5.3 Book "Science, Faith and the Climate Crisis" (Eds. Myers, Hemstock & Hanna; published in June 2020 by Emerald), arising from the Moana: Water of Life conference.
- 5.4 Moana Conference feedback sheets
- 5.5 Email from Lynnaia Main, Episcopal Church Representative to the United Nations
- 5.6 Testimonial letter from Dr Emily Colgan, Trinity Theological College, New Zealand.
- 5.7 Testimonial letter from Metanoia Festival Organising Committee.
- 5.8 Testimonial letter from Bishop Marc Andrus, Bishop of the Episcopal Diocese of California.