



ACSA Publications Listing

No. 5 – June 2018

List moderator: Colleen Foelz
(acsa.pubs.list@gmail.com)

Journal Articles - Conference Proceedings Articles Dissertations - Books & Chapters

From the moderator

Thank you to everyone who contributed to this issue of the ACSA Publications Listing.

The ACSA Publication Listing is a quarterly electronic listing of publications in the field of citizen science within the Australian community. The listing is intended to share information with those interested in the Australian citizen science community. The deadline for contributions is announced two weeks prior to the listing. Contributions may be submitted at any time.

Please only submit those publications where you are the author (to prevent duplication) and only include those that have been accepted for publication.

Colleen Foelz

Abstracts of recently published journal articles

How do marine and coastal citizen science experiences foster environmental engagement?

Angela J. Dean^{1,2,3}, Emma K. Church^{4,5}, Jenn Loder^{4,6}, Kelly S. Fielding³, Kerrie A. Wilson^{1,2}

1. ARC Centre of Excellence for Environmental Decisions (CEED), The University of Queensland, St Lucia, QLD 4072, Australia
2. School of Biological Sciences, The University of Queensland, St Lucia, QLD 4072, Australia
3. School of Communication & Arts, The University of Queensland, St Lucia, QLD 4072, Australia
4. Reef Citizen Science Alliance, Conservation Volunteers Australia, PO Box 423, Ballarat VIC 3353, Australia
5. School of Social Science, Monash University, Victoria 3800, Australia
6. Great Barrier Reef Foundation, 13/300 Ann St Brisbane, QLD 4000, Australia

Citizen science programs enable community involvement in scientific research. In addition to fostering greater science literacy, some citizen science programs aim to foster engagement in environmental issues. However, few data are available to indicate whether and how citizen science programs can achieve greater environmental engagement. We survey individuals choosing to attend one of seventeen reef citizen science events and examine the extent to which attendees reported three indicators of greater environmental engagement: (i) willingness to share information, (ii) increased support for marine conservation and citizen science, and (iii) intentions to adopt a new behavior. Most participants reported being willing to share information about reef conservation (91%) and described increased support for marine science and conservation (87%). Half of

participants (51%) reported intentions to adopt a new conservation behavior. We found that key elements of the citizen science experience associated with these outcomes were learning about actions to protect reefs and coasts (procedural learning), experiencing surprise, and experiencing negative emotions about environmental problems. Excitement was also associated with positive outcomes, but only in participants who were less likely to see themselves as environmental or were less frequent visitors to reefs and coasts. Importantly, the association between factual learning and environmental engagement outcomes was limited or negative. These findings suggest that the way citizen science experiences make people feel, may be more important for fostering future environmental engagement than factual-based learning. When designing citizen science programs for community members, these findings provide a reminder to not focus on provision of factual information alone, but to highlight environmental impacts while providing meaningful experiences and building environmental skills.

Published in *Journal of Environmental Management*, 2018, 213, 409-416.
doi: <https://doi.org/10.1016/j.jenvman.2018.02.080>

Building trust among marine protected area managers and community members through scientific research: Insights from the Ningaloo Marine Park, Australia

C. Cvitanovic¹, E.I. van Putten^{1,2}, A.J. Hobday^{1,2}, M. Mackay^{1,3}, R. Kelly^{1,4}, J. McDonald^{1,5}, K. Waples^{6,7}, P. Barnes⁸

1. Centre for Marine Socioecology, University of Tasmania, Battery Point, Tasmania 7004, Australia
2. Oceans and Atmosphere, CSIRO, Hobart, Tasmania 7001, Australia
3. Tasmanian School of Business and Economics, University of Tasmania, Sandy Bay, Tasmania 7004, Australia
4. Institute for Marine and Antarctic Studies, University of Tasmania, Battery Point, Tasmania 7004, Australia
5. Faculty of Law, University of Tasmania, Sandy Bay, Tasmania 7004, Australia
6. Marine Science Program, Department of Biodiversity, Conservation and Attractions, Kensington, Western Australia, Australia
7. Western Australian Marine Science Institution, Crawley, Western Australia, Australia
8. Department of Biodiversity, Conservation and Attractions, Exmouth, Western Australia, Australia

The success of participatory marine governance arrangements is influenced by the levels of trust that exist between decision-makers and diverse stakeholder groups within the community. While the benefits of high levels of trust among these groups is well established, specific approaches to building trust remain largely unknown. The aim of this study is to understand the extent to which scientific research programs can enhance trust among [marine protected area](#) (MPA) managers and community members via an evaluation of the Ningaloo Research Program - a large-scale program of marine research in the Ningaloo [Marine Park](#). Results from a survey of 125 local residents show that community members along the Ningaloo coast believe that scientific research is important for the management of the marine park, and strongly support government investment in scientific research in the region. Results also suggest that science undertaken through the Ningaloo Research Program has increased the extent to which community members trust local managers, which study participants believe has led to improved social and environmental outcomes in the region. Finally, additional opportunities are identified to maintain and further enhance trust between community members and MPA managers, via targeted communication and engagement programs that account for different personality 'types'. In particular, the establishment of citizen science programs might further build trust. These results suggest that scientific research could be used as a means to increase trust among decision-makers and community members when coupled with an effective

communication and outreach program, thus enhancing the success of participatory marine governance arrangements.

Published in *Marine Policy*, 2018, 93, 195-206.

<https://doi.org/10.1016/j.marpol.2018.04.010>

Citizen science in schools: Engaging students in research on urban habitat for pollinators

Manu E. Saunders, Erin Roger, William L. Geary, Floret Meredith, Dustin J. Welbourne, Alex Bako, Emily Canavan, Francesca Herro, Charlotte Herron, Olivia Hung, Madeline Kunstler, Jade Lin, Natasha Ludlow, Mayling Paton, Sunny Salt, Tallulah Simpson, Ariana Wang, Nikki Zimmerman, Kalani B. Drews, Hayley F. Dawson, Lachlan W. J. Martin, Jack B. Sutton, Chiquita C. Webber, Amy L. Ritchie, Leigham D. Berns, Bella A. Winch, Holly R. Reeves, Eiron C. McLennan, Jordan M. Gardner, Charli G. Butler, Emily I. Sutton, Max M. Couttie, Jake B. Hildebrand, Isabella A. Blackney, Justine A. Forsyth, Deborah M. Keating, Angela T. Moles

Citizen science can play an important role in school science education. Citizen science is particularly relevant to addressing current societal environmental sustainability challenges, as it engages the students directly with environmental science and gives students an understanding of the scientific process. In addition, it allows students to observe local representations of global challenges. Here, we report a citizen science programme designed to engage school-age children in real-world scientific research. The programme used standardized methods deployed across multiple schools through scientist–school partnerships to engage students with an important conservation problem: habitat for pollinator insects in urban environments. Citizen science programmes such as the programme presented here can be used to enhance scientific literacy and skills. Provided key challenges to maintain data quality are met, this approach is a powerful way to contribute valuable citizen science data for understudied, but ecologically important study systems, particularly in urban environments across broad geographical areas.

Published in *Austral Ecology*, 23 April 2018

<https://doi.org/10.1111/aec.12608>

Rapid declines across Australian fishery stocks indicate global sustainability targets will not be achieved without an expanded network of ‘no-fishing’ reserves

Graham J. Edgar¹, Trevor J. Ward², Rick D. Stuart-Smith¹

¹ Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Tasmania, Australia

² School of Life Sciences, University of Technology Sydney, PO Box 123, Broadway, New South Wales 2007, Australia

1. A continuing debate between environmental scientists and fisheries biologists on the sustainability of fisheries management practices, and the extent of fishing impacts on marine ecosystems, is unlikely to be resolved without fishery- independent data spanning large geographic and temporal scales. Here, we compare continental- and decadal-scale trends in fisheries catches

with underwater reef monitoring data for 533 sites around Australia, and find matching evidence of rapid fish-stock declines.

2. Regardless of a high global ranking for fisheries sustainability, catches from Australian wild fisheries decreased by 31% over the past decade. The biomass of large fishes observed on underwater transects decreased significantly over the same period on fished reefs (36% decline) and in marine park zones that allow limited fishing (18% decline), but with a negligible overall change in no-fishing marine reserves. Populations of exploited fishes generally rose within marine reserves and declined outside the reserves, whereas unexploited species showed little difference in population trends within or outside reserves.

3. Although changing climate and more precautionary fisheries management contribute to declining fish catches, fisheries-independent transect data suggest that excessive fishing also plays a major role.

4. The large number of fishery stocks that remain unmanaged or have poor data, coupled with continuing declines in the stock biomass of managed fish species, indicate that Aichi Target 6 of the Convention on Biological Diversity (i.e. 'by 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably') will not be achieved in Australia, or elsewhere.

5. In order to maintain some naturally functioning foodwebs supported by large predators and associated ecosystem services in this era of changing climate, a greatly expanded network of effective, fully protected marine protected areas is needed that encompasses global marine biodiversity. The present globally unbalanced situation, with >98% of seas open to some form of fishing, deserves immediate multinational attention.

Published in *Aquatic Conserv: Mar Freshw Ecosyst.*, 31 May 2018, 1-14
<https://doi.org/10.1002/aqc.2934>

Social licence through citizen science: A tool for marine conservation

R Kelly, A Fleming, G Pecl, A Richter, A Bonn

Citizen science can increase social licence for conservation. With decreasing trust in government, active and meaningful public engagement in science and data collection is needed to foster informed and publically-accepted natural resource management. Citizen science presents a valuable avenue to achieve such engagement, in addition to other benefits. Citizen science is a partnership between scientists and the public to address scientific questions of common interest or often, concern, and to collect, analyse, publish and communicate data for science. This study explores whether citizen science can also play a role in generating social licence, using European marine citizen science as a case study. To date, social licence in the marine space has largely focused on industry and extractive uses of the marine environment. However, much could be gained in exploring social licence for non-extractive uses including marine conservation and the best means to engage the public to support these efforts. Here, we use in-depth semi-quantitative interviews and online surveys to demonstrate how citizen science may play a role in enhancing social licence and the mechanisms through which this can occur. Our research suggests that citizen science can engage and inform the public about science and the marine environment and can enhance the flow and exchange of information between society, science and marine management. Citizen science may have considerable potential to generate and develop social licence for marine conservation in Europe and elsewhere.

bioRxiv, 2018
<https://doi.org/10.1101/266692>

Abstracts of recently published books and chapters

Shorebird monitoring in Australia: a successful long-term collaboration among citizen scientists, governments and researchers

Hansen, B.D¹, Clemens, R.S., Gallo-Cajiao, E., Jackson, M.V., Kingsford, R.T., Maguire, G.S., Maurer, G., Milton, D., Rogers, D.I., Weller, D.R., Weston, M.A., Woehler, E.J., Fuller, R.A.

¹Centre for eResearch and Digital Innovation, Federation University Australia

Pp. 149-164. In: Legge, S., Lindenmayer, D. B., Robinson, N. M., Scheele, B.C., Southwell, D.M. & Wintle, B.A. (Eds). Monitoring threatened species and ecological communities. CSIRO publishing, Melbourne.

<http://www.publish.csiro.au/book/7720/>

Abstracts of recently published conference proceedings

Abstracts of recently published dissertations
