OCEANS PAST NEWS No.2
NOVEMBER 2016

OCEANS PAST INITIATIVE

GREETINGS!

This issue of Oceans Past News focuses on Oceania, Asia, and the Southwest Pacific, a region of contrasting human antiquity. Modern humans settled in Australia approximately 50-60,000 years ago, while 2,200km east across the Tasman Sea, people arrived in Aotearoa/New Zealand only about 760 years ago. In both land masses, humans exploited the margins of the sea - but the contrasting histories offer unparalleled insights into the effects of changing climates and human impacts. In Asia, people have been fishing and trading along the coast for millennia, but only recently have there been attempts to understand the impacts of this activity on exploited marine populations and on human society over the longer term. In the region as a whole, the disciplines of marine historical ecology and marine environmental history are still in their infancy and there are many compelling questions to address about human impacts on the marine environment from a historical perspective. In this issue, we bring you some exciting snippets about the latest research occurring in the region.

Alison MacDiarmid, PhD.
National Institute of Water & Atmospheric research (NIWA), New Zealand

10 QUESTIONS: HEIDI ALLEWAY

*Each issue of Oceans Past News will include a feature article to highlight research happening in our community, as either the **Oceans Past Spotlight** or **10 Questions**, which will pose the same 10 questions to different leaders in our field. If you would like be considered for either, or to nominate a colleague or mentee, please contact Emily Klein at emily.klein04@gmail.com.*

Heidi is the General Manager of the Aquaculture, Policy, and Environment Unit, Department of Primary Industries and Regions, South Australia (PSIRA). She lives in Adelaide, Australia.

Q1. First, a brief introduction: can you describe your research as it pertains to the past in two sentences or less?

My research broadly focuses on the temporal scale in ecosystems and marine resources, and how time, through human activities including colonization, patterns of use and societal preferences, and approaches to management, has influenced the way they are today.

Q2. Why do you find research on the past important?

Learning how human communities perceived and used ecosystems in the past can reveal changes or past states we never even knew existed. Without this knowledge, I don't believe our understanding of contemporary environments can ever be complete. It may be complete enough, with respect to our ability and capacity to, for example, manage fisheries or implement conservation initiatives. But is this enough, for science and society, when we consider a population size, community structure, or habitat distribution alongside the way it looked in the past?

Q3. Was there a person or event that had a particular influence on your commitment to studying historical ecosystems?

No one person influenced my decision to focus on historical ecosystems. It was a combination of reading the work of Pauly, Jackson and Dayton and an interest in finding out what historical information might be available to the Department of Fisheries in South Australia that saw me essentially 'fall into' this niche.

Q4. What advice do you have for engaging in historical work?

Don't be afraid of trying an analysis or pursuing a line of inquiry that might end up being seemingly unsuccessful. While there is a risk you may make mistakes in recording or processing data, that your initial investigation might not prove as useful as you pictured, or that you were not able to obtain enough data to perceive or understand a pattern, these inquiries often end up connecting with others at some point in the future. That connection is not one you would have made or found if the original path wasn't pursued in the first place, so thinking and tinkering never ends up being wasted time. Do listen, read, and learn as much as possible from those who have tried and developed methods previously. The methods for analysis can be the hardest part, and everyone's made mistakes!

Dr. Alleway, right, on a recent trip scoping potential oyster restoration projects in the East China Sea.

Q5. Do you believe the past can help in solving contemporary environmental/ social problems, and if so, what is one area we can provide insight on?

Without a doubt. The past can help us better interpret the state/s of contemporary ecosystems and in doing so support improved options for management of natural resource use. Even when management arrangements and targets are effective in the current setting they can still be improved. Challenges always exist, whether it is limitations to the data or the pressures of negative social or political discourse. I believe historical work can contribute much to these debates and may provide a means for grounding important policy decisions.

Q6. When you do assess our current environmental and societal challenges, what gives you hope?

Gains in ecosystem restoration are being made all the time. These techniques are informed and directed by data on historical baselines, which significantly increases the potential for success. Palaeoecological and archaeological data in particular provide insights into the way elements of ecosystems could and should function when restored.

The cross-disciplinary nature of historical work is also exciting. More specifically, both the environmental history and historical ecology disciplines contribute unique skills and an applied path to understanding past ecosystem states, however, using a combination of techniques and concepts from each may enable us to be even more influential. For example, connecting with society and the public can be prompted and evoked through environmental history text, and thus assist in ecological work being better understood and resonating with the broader audience.

Q7. What knowledge would you like to pass on to the next generation, of the public or of scientists?

The understanding that it is ok to question what we know and what we perceive to be true. An inquisitive nature must have led early environmental historians and historical ecologists to question current baselines and this same sense of examination is something we should encourage in future generations. Also, field specialization is critical to scientific progress, but understanding and appreciating the role and skill of others and other disciplines, as well as encouraging a conscious critique, make us better placed to continue making progress when it is most needed.

Dr. Alleway in action!

Q8. What field of research – besides your own – do you consider most exciting?

Restoration ecology. I don't overlook the challenge of the occurrence of ecosystem states for which we have no analogue or disagree that these environments will characterize our future, as well as present a significant challenge to decision-making for politicians, managers and scientists alike. However, the case for restoration should not be overlooked or dismissed as a concept as the 'garden of Eden'. Ecosystem restoration has benefits well beyond this ideal. These benefits are returned through the parts or functions of an ecosystem that can be positively affected by restoration techniques. Using historical baselines to inform the target, methods or design is an exciting influence we can have.

Q9. What are you reading at the moment?

As many papers as possible on oyster reef and oyster population restoration, particularly those around detailed restoration design and methods, mostly from the USA. Also 'Under the Sea – Wind' by Rachel Carson and 'The Saga of the Exiles' by Julian May, for down time.

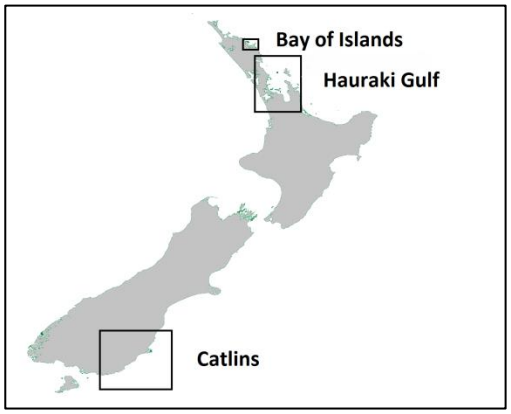
Q10. What is a critical but perhaps under-acknowledged question we as a community should be asking?

What consequence/s do changes to past ecosystems have on contemporary ***human*** communities, e.g. what consequence, with respect to lost revenue, lost food resources, lost function from ecosystems, is felt by society today? If we can quantify the value of this impact, be it negative or positive, we will be better placed to advocate for and have our work applied to policy and management.

RESEARCH NEWS

Human impacts in New Zealand marine environments

New Zealand was one of the last significant-sized landmasses to be colonized by people, and it provides rare opportunities for tracking the course of human impact on pristine marine environments. The key overarching research into the impact of people on the marine environment for New Zealand has been that of Alison MacDiarmid and her team, but they have focused particularly on Hauraki Gulf in the north of the country and the Catlins coast in the south. How representative are their results – for the country as a whole, and for the north in particular?



Map of New Zealand showing study areas.

To find out, **Dr. John Booth** studies change over time in key aspects of the marine ecology of the Bay of Islands (35° 12′ S, 174° 10′ E), a 350-km^2 microcosm of nearby Hauraki Gulf, from before human arrival (about 1300 AD for the Bay of Islands) to the present time. Dr. Booth focuses on what ~800 middens can tell us about enduring impacts pre-Contact (1769 AD) harvesting might have had on the ecology of fish and shellfish, as well as other marine taxa of the Bay of Islands. His work suggests 500 years of Māori harvesting pressure (and a local population of perhaps as many as 10,000 in 1750) left no lasting legacy on Bay of Islands' fish and shellfish resources – with the probable exception of the fishing-out of local populations of the Cook Strait limpet, *Cellana denticulata*, a shellfish at the edge of its natural range. As it turned out, indirect effects of poor forestry and farming practice, in particular, had much greater long-term effects on the fish and shellfish of the Bay of Islands than Māori ever had, soon to be compounded by the intense commercial and recreational fishing of the mid- to late-1900s (Booth 2016).

But, almost certainly, overharvesting in the Bay of Islands contributed to the extinction of sea lions (a lineage of *Phocarctos hookeri*) in the Early Period (pre-1450 AD), and to the extirpation of breeding colonies of the New Zealand fur seal, *Arctocephalus forsteri*, from Northland by 1500 AD. Furthermore, the Pacific rats, *Rattus exulans*, transported on early canoes, together with human harvesting, resulted in seabird extinctions and extirpations. In sum, this story of change over time in the Bay of Islands fish, shellfish, marine mammal and seabird heritage almost perfectly mirrors that for the Hauraki Gulf – which is encouraging and confirms earlier research. *Related reading:* ***Booth, J.D.*** *(2016). Ecological consequences of pre-Contact harvesting of Bay of Islands fish and shellfish, and other marine taxa, based on midden evidence. Journal of Pacific Archaeology 7: 73-86.*

Ancient DNA illuminates early Māori impacts on marine megafauna

A series of studies at New Zealand's University of Otago using ancient DNA from Māori archaeological sites indicates the rapid impact of small populations of humans on marine megafauna soon after first settlement. Analyses of modern and ancient DNA, radiocarbon dating, and Bayesian modelling undertaken by Rawlence et al. (2015) show that the southeast South Island lineage of the Stewart Island Shag (*Leucocarbo chalconotus*) was formerly widespread across coastal South Island, but experienced dramatic population extinctions, range retraction and lineage loss soon after

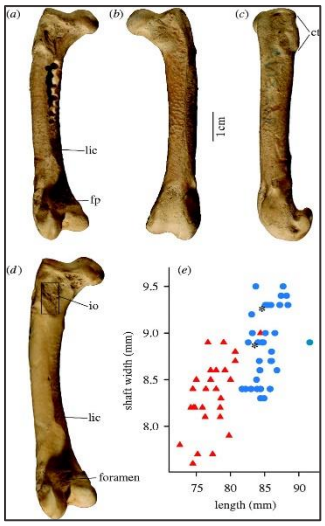


Fig. from Boessenkool et al. Prehistoric, historic, and modern penguin bones were used to establish past species distributions.

human arrival around 1280 AD. Similarly, Collins et al. (2014) used analysis of ancient DNA to show that extinction of an endemic sea lion lineage (*Phocarctos* spp.) soon after human arrival in mainland New Zealand probably aided the northward range expansion of a lineage formerly restricted to the sub-Antarctic islands (Collins et al. 2014,). Among coastal penguins (*Megadyptes* spp.) a comparable mainland species extinction– sub-Antarctic species replacement event occurred (Boessenkool et al. 2009). These studies suggest that impacts on vulnerable marine fauna may occur very rapidly – within two hundred years of human settlement – and have been detected in New Zealand only because coastal archaeological sites from first settlement are still present. In most other places around the world, where human settlement took place >10,000 years ago, evidence of the earliest exploitation of marine fauna has been lost due to rising sea levels.

Publications: (1) Boessenkool, S., et al. 2009 ***Relict or colonizer? Extinction and range expansion of penguins in southern New Zealand*** *(http://bit.ly/2eXbMZ2); (2) Collins CJ, et al. (2014)* ***Extinction and decolonization of coastal megafauna following human arrival in New Zealand*** *(http://bit.ly/2e4j5zd); (3) Rawlence NJ, et al. (2015).* ***Geographically contrasting biodiversity reductions in a widespread New Zealand seabird*** *(http://bit.ly/2eYZkqv).*

Fig. from Alleway et al.(2016): Historical photographs of inland fishing in South Australia.

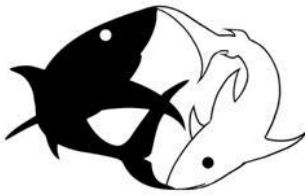
European colonialism & concurrent trends in fisheries preferences: Societal preferences have been a major driver of patterns of change across archaeological, historical and contemporary timescales. Using different geographically regions or countries as experimental controls for hypotheses, it may be possible to test these patterns of change across greater (global) spatial scales. Scientists recently published research highlighting the commonality between patterns of fisheries resource use in Europe and Australia, predicated on the societal expectations of European settlers. Despite the development of prevalent and high yield inland fisheries in South Australia shortly after colonization, inland fisheries now contribute very little to overall production, principally from introduced species, and marine fisheries now dominate production for the table and plate. Further, many parts of Australia, and Europe, identify with marine fisheries and seafaring 'pioneers', however, there are illustrations that in both regions freshwater species were in the past often preferred. *Related publication: Alleway, H. K., Gillanders, B. M. & Connell, S. D. 2016.* ***'Neo-Europe' and its ecological consequences: the example of systematic degradation in Australia's inland fisheries****.*

Understanding trends in oyster harvests: Understanding the historical roots of current trends is also being extended into research associated with coastal fisheries, specifically oysters along the southern and eastern Australian coast. Here, extensive oyster dredge fishing occurred in many locations, and contributed to the widespread overexploitation of oyster reefs. Understanding the area and scale of historical oyster fishing could motivate restoration and support a 'revival' of these past preferences through sustainable means of resource use, such as aquaculture. A coordinated, national-level approach to understanding the past distribution of oyster reefs and historical fishing across Australia is currently being coordinated by the **National Shellfish Reef Restoration Network** *(http://bit.ly/2dEFcfM).*

Silent film on early marine surveys now available online: Danish marine scientist, Johannes Schmidt, was a pioneer when it comes to popularizing deep-sea marine research through the use of mass media. When Schmidt headed the Carlsberg Foundation's Oceanographical Expedition Around the World (1928-30), he brought along a film camera, documenting the surveys conducted onboard as well as encounters with local populations. This film consists of 20 sequences, and is available at: **http://bit.ly/2drt0MR**. Contact **Bo Poulson** (*bpoulsen@cgs.aau.dk*) for more info.

COLLABORATIONS

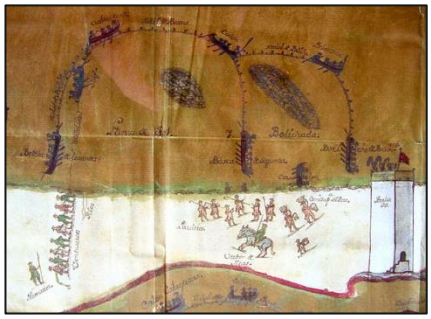
Pearling in the Indian Ocean World: Investigators and collaborators in Professor James Warren's Discovery Project '**Pearls, People, and Power: Global Commodity History and Material Culture in the Transformation of the Indian Ocean World, 16th-20th Centuries**' held their inaugural meeting at the International Congress of Maritime History, at Murdoch University on 27 June to 1 July 2015. Pearling is one of the most important maritime industries in Indian Ocean world history, and topics discussed included production, labour allocation, trade and consumption of pearls and mother-of-pearl across an interconnected region spanning from East Africa and the Red Sea to the Arabian Gulf, India and Sri Lanka, Northwest Australia and Torres Strait, and the waters of Southeast Asia. Moving forward, a principal aim of this Discovery project collaboration is to investigate the multi-dimensional and interdependent connections of Indian Ocean world history, as revealed through comparative studies of different pearling industries. Across millennia, the many pearling grounds of the Indian Ocean provided both luxury items and bulk commodities for long-distance trade. The repercussions of this global trade resulted in mass movements of peoples to the Indian Ocean pearling grounds, and led to the advent of conflicts between local rulers and imperial powers over the control of pearling industries and the conduct of trade in commodities such as opium, textiles, guns and tea linked to the production and circulation of pearls and pearlshell.



Evaluating the attitudes of the public towards sharks: A collaboration is aiming to understand public attitudes towards sharks and investigate differences between regions and countries. The anonymous online questionnaire is translated in over ten languages to engage as many people as possible across diverse backgrounds. This project involving the University of Padova (*http://chioggia.biologia.unipd.it/en*), iSea (*http://isea.com.gr/en*/), the National Institute of Oceanography and Experimental Geophysics (*http://www.ogs.trieste.it/en/content/institute*), the Portuguese Center for Global History, and NIWA (*https://www.niwa.co.nz/*). For further information: **info@tshark.org**.

To take part in the survey, please visit: www.tshark.org/questionnaire.

NEW PUBLICATIONS



The Inland Seas: Towards an Ecohistory of the Mediterranean and the Black Sea. Bekker-Nielsen T. and Gertwagen R. (eds), published by Franz Steiner Verlag (Stuttgart). In this volume, the first on its subject, eighteen scholars from eleven different countries and a wide range of scientific disciplines address the question of how humans have interacted with the Mediterranean-Black Sea ecosystem from the dawn of prehistory until the twentieth century, and from the Sea of Azov as far as the straits of Gibraltar. Each paper presents an overview of the state of our present knowledge within a specific field of archaeology, biology, history, economy, sociology or ecology and highlights the specific methodological problems facing the study of the Mediterranean-Black Sea ecosystem. They also pay special attention to the complex interrelationship between human society on the shore and life in the sea, and the ways in which societal and economic changes among the shore populations, or changes in trading patterns, have affected the scope and extent of marine harvesting. Available at: http://bit.ly/2essej5.

Acebes, J. M. V., and M. Tull. 2016. **The history and characteristics of the Mobuild Ray Fishery in the Bohol Sea, Philippines**. *PLOS ONE*. (*http://dx.doi.org/10.1371/journal.pone.0161444*).

Beller, E. E., and P. W. Downs, R. M. Grossinger, B. K. Orr, and M. N. Salomon (2016). **From past patterns to future potential: using historical ecology to inform river restoration on an intermittent California river.** *Landscape Ecology* 31(3): 581-600. *doi: 10.1007/s10980-015-0264-7* (*http://bit.ly/2dGLj1W*).

Bentze, P., and I. R. Bradbury. **Don't bet against the natal homing abilities of marine fishies**. *Molecular Ecology* 25(12): 2691-2692. *doi: 10.1111/mec.13591* (*http://bit.ly/2ekJFWv*).

Fortibuoni, T. and D. Borme, G. Franceschini, O. Giovanardi, S. Raicevich (2016). **Common, rare or extirpated? Shifting baselines for common angelshark, *Squatina squatina* (Elasmobranchii: Squatinidae), in the Northern Adriatic Sea (Mediterranean Sea).** Hydrobiologia 772(1): 247-259. (*http://bit.ly/2ekB1ab*)

McCain, J. S. P., and R. W. Rangeley, D. C. Schneider, and H. K. Lotze (2016). **Historical abundance of juvenile commercial fish in coastal habitats: Implications for fish habitat management in Canada**. *Marine Policy* 73: 235-243. (*http://dx.doi.org/10.1016/j.marpol.2016.08.009*).

Usseglio, P., and A. M. Friedlander, H. Koike, J. Zimmerhackel, A. Schuhbauer, T. Eddy, and P. Salinas-de-León (2016). **So Long and Thanks for All the Fish: Overexploitation of the Regionally Endemic Galapagos Grouper Mycteroperca olfax (Jenyns, 1840)**. PLOS ONE. (*http://dx.doi.org/10.1371/journal.pone.0165167*).

ANNOUNCEMENTS: CONFERENCES

American Society for Environmental History Conference: **Winds of Change: Global Connections across Space, Time, and Nature**. Chicago, Illinois, USA. March 29 - April 2, 2017. *http://aseh.net/*.

Call for abstracts: European Geosciences Union Conference: **Annually resolved archives of marine climate change session.** Vienna, Italy, 23-28 April 2017. Deadline 11 January 2017: *http://bit.ly/2f2dCun*.

Oceans Past VI Conference: **Historical perspectives on the elements and dynamics of the marine socio-ecological system**. Sesimbra, Portugal, May 2017. *http://www.escolademar.pt/oceanspastvi/*.

European Society for Environmental History (ESEH) Biennial Conference: **Natures in between. Environments in areas of contact among states, economic systems, cultures and religions.** Zagreb, Croatia, 28 June to 2 July 2017. *http://eseh.org/event/next-conference/*.

Call for Expressions of Interest to Host the ESEH 2019 Conference. *http://bit.ly/292kNhU*.

Call for panels (19 Oct – 5 Dec 2017) for the III CHAM International Conference: **Oceans and Shores: People, Heritage and Environments**. Lisbon, Portugal, July 2017: *http://www.nomadit.co.uk/cham/cham2017/index*.

The **3rd World Congress for Environmental History** will be held at the Universidade Federal da Santa Catarina in Florianópolis, Brazil, during the fourth week of July 2019. Although it is still 3 years away, mark your calendars now!

ANNOUNCEMENTS: EMPLOYMENT OPPORTUNITIES

The **School of Arts and Sciences at the University of Pennsylvania** invites applications for a tenure-track assistant professor appointment in **environmental humanities**, broadly interpreted to embrace disciplinary and interdisciplinary approaches from the humanities, social sciences, and natural sciences. Review of applications begins **November 3, 2016**, and will continue until the position is filled. *http://www.iceho.org/*

CONTACT

Oceans Past News is a quarterly newsletter that aspires to both unite and inform the worldwide community interested in historical perspectives of marine social-ecological systems by providing insight into the wide-ranging and excellent work being done and the resources available. If you would like to propose work for OPN in the future, please contact **Emily Klein** (*emily.klein04@gmail.com*) or **Cristina Brito** (*escolademar@gmail.com*).

The next Oceans Past News will be mid-January 2017. We warmly welcome submissions until the end of 2016.

RESOURCES

Oceans Past Initiative: http://www.tcd.ie/history/opi/