NEWSLETTER

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Resist, accept – or both?

Welcome to the first OPN of 2022! With so much uncertainty in our world, I am left again reflecting on what this new year will bring. Last year, forest fires and other climate-related impacts ripped through towns in some areas, while rising tides aim to swallow up others – and I wish for more urgent action from leaders. We crave a return to "normal", but I wonder how much we are already there, in the "*new* normal". Will we aim to be resistant to change, or adapt to new conditions? Where is the balance between acceptance, and recovering and protecting what we can? As we look forward, I still have strong faith the past holds critical insight on our way forward.

Emily S. Klein, *OPN Editor*
Pew Charitable Trusts, Washington DC, USA†

OCEANS PAST SPOTLIGHT*

10 Questions: Carolina Chong-Montenegro

(University of Queensland / University of Exeter)

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

Many recreational fisheries have existed for just as long as commercial fisheries, yet little information is known about past socio-ecological drivers that led to the current fisheries state. My research seeks to address this knowledge gap by using unconventional resources to create and analyze quantitative historical fishery datasets.

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

Understanding of the past can teach us about the magnitude of otherwise unappreciated change. In addition, reconstructions of past systems can inform us about the cumulative effects and consequences of our actions.

Q3. Was there a person or event that influenced your commitment to studying history and historical ecosystems?

My work in fisheries often involves interviewing fishers. Despite working in several countries along the Tropical Eastern Pacific, there was one phrase that resonated across borders and among fishers: "the fishing it is not like used to be…". Knowing that many people in this region rely on fishing as their primary source of food and income, I began to investigate the past to provide answers and possible solutions to restore and sustain the fisheries.

Q4. What advice would you give those who want to engage in historical work or collaborate with our community?

There is an incredible amount of information to uncover on historical documents, providing opportunities for new research questions.

† Views expressed here are my own and do not necessarily reflect that of my employer

Each issue of Oceans Past News includes a feature article, either as an **Oceans Past Spotlight or as **10 Questions**. If you would like to be considered for either, or to nominate a colleague or mentee, please contact Emily Klein at emily.klein04@gmail.com.*

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

Absolutely! Without understanding past ecosystems states, how can we create baseline goals for successfully restoration of degraded ecosystems? I would like to see more interdisciplinary collaborations to develop and apply realistic targets based on historical work.

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

We are seeing the protection, and even recovery, of once-endangered species such as the Atlantic Goliath Grouper and Bald Eagles in the USA. These conservation success stories encourage me to continue fighting for feasible solutions for species and ecosystems at risk in the Tropical Eastern Pacific.

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

To the next generation of young scientists, pursue your dream career, take chances, be positively influential, and inspire others.

Q8. What field of research – besides the one you are working in – do you consider most exciting?

I am also interested in evolutionary ecology of fish, in particular how fishing affects the population structure of fish with complex life histories.

Q9. What are you reading at the moment?

In my spare time, I like to take a step outside science and submerge myself in books about historical fiction. In particular, I enjoy reading South American literature as it brings me closer to home. At the moment I am reading ***El General en su laberinto*** by **Gabriel Garcia Marquez**.

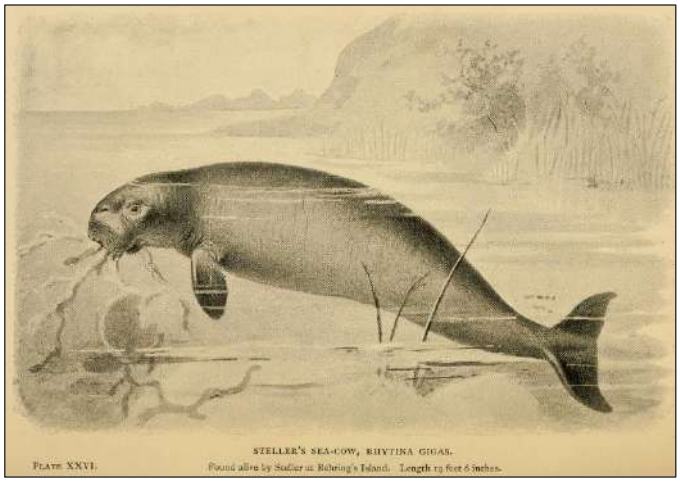
Q10. What is a critical but perhaps under-acknowledged question we as a community should be asking?

When I look at the ocean or a reef, I ask myself, has this system been always like this? Or is this just a mere reflection of our impact?

RESEARCH NEWS

The ghost of a giant: How an extinct megaherbivore may have structured kelp forests across the North Pacific Rim.

In a recent article in *Global Ecology and Biogeography*, **Bullen et al**. examine the historic extinction of the **Steller's sea cow** (*Hydrodamalis gigas*) and its possible impacts on ecological dynamics. The Steller's sea cow was a large (>7m long) herbivorous sirenian of the North Pacific that went extinct in the mid-18th century. The global decline of megafauna such as the sea cow is believed to have had significant and wide-spread ecological impacts, however, little has previously been published on how the loss of this megaherbivore may have affected coastal ecosystem dynamics. Drawing on historical evidence, sea cow biology, kelp forest ecology, and the ecology of extant sirenians, we proposed several discrete hypotheses about the effects Steller's sea cows may have had on kelp forest dynamics of the North Pacific. The evidence we



Drawing of a Steller's sea cow from the 1896 book Extinct Monsters.

Photograph of an underwater kelp forest from the article (Ryan Miller).

reviewed suggests that sea cows exerted substantial direct and indirect influences on kelp forests, likely affecting (a) the physical ecosystem structure, (b) productivity, (c) nutrient cycling, (d) species interactions, and (e) the export of nutrients to surrounding ecosystems. These hypotheses indicate that sea cows likely played an important, and now vacant, role in the North Pacific, and suggests that kelp forest dynamics and resilience were already significantly altered prior to more recent and well-known stressors such as industrial fishing and climate change. This article and the case of the Steller's sea cow serves as an example of the important ecological roles that are lost with megafaunal extinction. ~ *Cameron Bullen.*

Related publications: Bullen CD, Campos AA, Gregr EJ, McKechnie I, & Chan KMA. 2021. The ghost of a giant – Six hypotheses for how an extinct megaherbivore structured kelp forests across the North Pacific Rim. Global Ecology and Biogeography *30: 2101– 2118. https://doi.org/10.1111/geb.13370.*

Paintings reveal previous plenty. There is evidence of the past everywhere – including art. Art tells the story of past civilizations, but also of past ecosystems and biodiversity, providing critical information for conservation today. This info is important for indicating previous references needed to understand current health and set targets, given that current systems are often already degraded below appropriate targets. This work focused on the historical and ecological knowledge of aquatic resources in Western Europe (Atlantic, North Sea, and Mediterranean Sea), analyzing Early Modern paintings for evidence of previous aquatic biodiversity using the statistical tools of numerical ecology. The geographic and temporal variations of the biodiversity represented in these paintings were interpreted on the context of environmental and human pressures, and results highlight the natural and anthropic drivers of spatial and temporal change in species in the paintings. Collectively, the research indicates an overall decrease of represented taxa through time, especially in continental and freshwater species. The authors consider their results against previous works of historical ecology, archeology, history, and biology, and discuss the relevance and potential future contributions of their method to better understand the past reference state of aquatic socio-ecosystems. *Publication: Tribot et al. 2021. Multi-secular and regional trends of aquatic biodiversity in European Early Modern paintings: toward an ecological and historical significance.* Ecology and Society. *doi.org/10.5751/ES-12740-260426.*

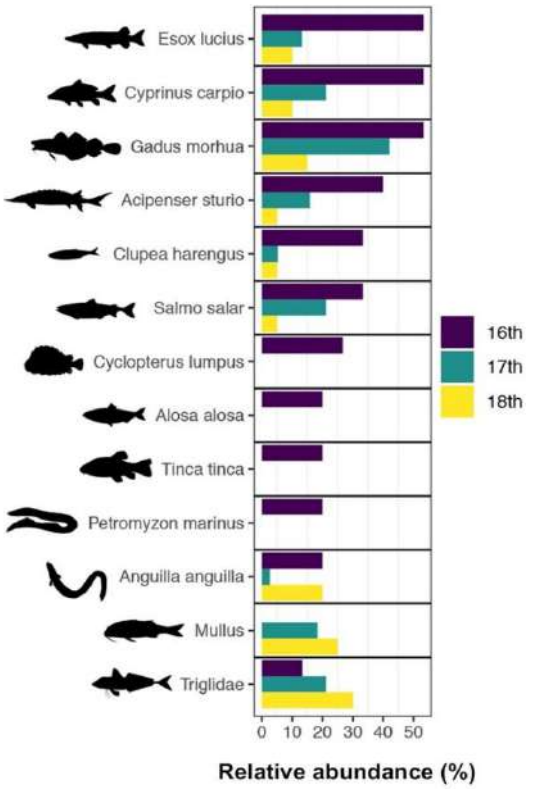


Fig 4b from the article: Abundance (in %) of taxa in the paintings in the 16th, 17th, and 18th centuries. Only the species with the highest variations are shown (based on the first decile of the distribution of standard deviation between the three periods).

RESOURCES & COLLABORATIONS

Conservation Paleobiology Network Student Coffee Hours! Did you know the CPN student panel hosts student coffee hours? They are monthly informal meetings where students interested in conservation paleobiology and related disciplines can meet their peers and discuss relevant topics—research as well as the job market, publication process, conferences and meetings, policies, science communication, work-life balance, and mental health. To cover time zones, separate hour-long (60 minutes) meetings will be held for the Americas and Eurasia. If you are interested in joining or moderating a coffee hour, please fill out the Google form at: https://forms.gle/Qcm7qefmGfYAwPw7A. You will be added to an email list to receive dates and zoom links.

New working group to disentangle climate launched. A new PAGES Working Group, "**Q-MARE: Disentangling climate and pre-industrial human impacts on marine ecosystems**" launched this month, with meetings in mid-January. Both climate and human activities have altered marine ecosystems for thousands of years, altering ecosystem structure and dynamics well before industrialization. Q-MARE brings together scientists from across disciplines to disentangle past climate and human-induced changes and explore the timing and scale of human impacts on Quaternary marine ecosystems by combining paleontological, paleoclimatic, archaeological, and historical data. The WG aims to produce new results on biodiversity loss under natural climate variability and the sustainability of both ecosystems and societies under the low CO2 emission levels of the pre-industrial world, as well as guidelines for the integration of observation data and proxy-based reconstructions with dynamic ecosystem models. This group welcomes anyone interested, with early-career researchers particularly encouraged. More information at https://pastglobalchanges.org/science/wg/q-mare/intro.

RECENT PUBLICATIONS

Bullen CD, Campos AA, Gregr EJ, McKechnie I, & Chan KMA. 2021. **The ghost of a giant – Six hypotheses for how an extinct megaherbivore structured kelp forests across the North Pacific Rim**. *Global Ecology and Biogeography* 30:2101– 2118. https://doi.org/10.1111/geb.13370.

Chancha I, Borges C, Colonese AC, Macario K, Toso A, Fontanals-Coll M, dos Anjos R, Muniz M, Pereira R, Talamo S, Guedes Milheira R. 2021. **Food and diet of the pre-Columbian mound builders of the Patos Lagoon region in southern Brazil with stable isotope analysis**. *Journal of Archaeological Science* 133: 105439. https://doi.org/10.1016/j.jas.2021.105439.

Delgado JP, Brennan ML, Rapu Haoa SA, Rapu Leong JH, Gaymer CF, Carabias D, Stokes E, Wagner D. 2022. **The hidden landscape: Maritime cultural heritage of the Salas y Gómez and Nazca ridges with implications for conservation on the high seas**. *Marine Policy* 136:104877. https://doi.org/10.1016/j.marpol.2021.104877.

Thurstan RH. 2022. **The potential of historical ecology to aid understanding of human-ocean interactions throughout the Anthropocene**. *J Fish Biol*. https://doi.org/10.1111/jfb.15000.

Toso A, Hallingstad E, McGrath K, Fossile T, Conlan C, Ferreira J, da Rocha Bandeira D, Fonseca Giannini PC, Gilson S-P, de Melo Reis Bueno L, Ribeiro Bastos MQ, Borba FM, do Santos AMP, Colonese AC. 2021. **Fishing intensification as response to Late Holocene socio-ecological instability in southeastern South America**. *Scientific Reports* 11: 23506. https://doi.org/10.1038/s41598-021-02888-7.

Tribot A-S, Faget D, Villesseche H, Richard T, Changeux T. 2021. **Multi-secular and regional trends of aquatic biodiversity in European Early Modern paintings: toward an ecological and historical significance**. *Ecology and Society* 26(4):26. https://doi.org/10.5751/ES-12740-260426.

ANNOUNCEMENTS: CONFERENCES

Call for abstracts. This is a call for abstracts for PAGES Open Science Meeting (OSM) session #18, "**Using high resolution marine archives to investigate marine climate, marine environment and maritime societies through the Holocene**." The session will have a strong society/cultural element, and the OSM will be held online **16-20 May 2022**. Sclerochronological marine proxy archives are being used to analyse and reconstruct marine climates and marine environments at ever higher resolutions, allowing spatial and temporal leads and lags to be identified, so that the underlying mechanisms and dynamics of the marine system can be described in increasingly fine detail. The marine realm has also been a key component of the spread and transformation of human societies through the Holocene, and the marine climate and environment have at different times and in different places acted to make these

transformations possible or inevitable, and perhaps to make other transformations unfeasible. At the same time, human societies in maritime settings are likely to have impacted their surrounding environment. This reflects, with a marine focus, the three themes of the PAGES science structure. In this session we will highlight the use of high-resolution sclerochronological marine archives (e.g. bivalve mollusc shells, corals, fish otoliths, coralline algae) from marine and archaeological settings (e.g. shell middens), and historical documentary records, coupled with climate and biological models, to analyse and reconstruct marine climate, the marine environment and maritime societies, and their mutual interactions, through the Holocene. Abstracts can be submitted at https://www.conftool.com/pages-osm-2022/index.php?page=login (you will need to create an account), and the deadline is **31st January 2022.** More info on the meeting website, https://pages-osm.org/index.php/osm/osm-program.

ESSAS and Oceans Past Initiative joint conferences. The Oceans Past XI conferences, hosted by the **University of Washington (USA)** will take place **22-25 June 2022** (conveners are currently assessing hybrid in-person/remote options), and overlaps with the **Ecosystem of Subarctic Seas Annual Science** (ESSAS) meeting taking place **19-22 June**. As we enter the UN Decade on Ecosystem Restoration and Ocean Science for Sustainable Development, the importance of long-term perspectives for understanding past changes to and connections across oceans and maritime communities becomes ever clearer. This interdisciplinary conference will bring together global researchers to build our understanding of our past oceans and ocean life (human and non-human), on and below the water. More info, including on support for Early Career Researchers, at https://oceanspast.org/opix.php.

ANNOUNCEMENTS: OPPORTUNITIES

Research Associate in conservation paleobiology. Colgate University (New York, USA) is hiring a post-baccalaureate research associate for a 9-month position to start mid-May 2022. The position will work with a lab group on conservation paleobiology projects in the northern Gulf of Mexico, specifically live-dead analyses of life history traits in bivalve mollusks. The position is expected to include offshore fieldwork in Louisiana, Alabama, and Florida, as well as data collection and analysis at Colgate University in Hamilton, New York. Review of applications will begin February 28, 2022. For more information and details regarding how to apply: https://careers.colgate.edu/postings/3861.

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).

*The next Oceans Past News will be out mid-April 2022. We **warmly welcome submissions** through March 2022.*

RESOURCES

*The Oceans Past News Archive is available online: **https://oceanspast.org/newsletter.php***
*More on the Oceans Past Initiative: **http://oceanspast.org***
*OPI on Facebook: **https://www.facebook.com/groups/122288493384/** and Twitter: **@oceans_past***