

Restoration.

In the Anthropocene, we understand people as the major current driver of change on our planet. For many of us, this motivates a desire to reduce our impact, and to find ways to recover what we have lost. As research in this edition denotes, from Dr. Philine zu Ermgassen's Spotlight and others' research on oysters to past biodiversity in Brazilian middens, history holds critical clues to help us advance effective restoration of our oceans.

The theme of *restoration* is also one that is personally resonating for me right now. With the recent elections, misinformation on social media, and the new rise in the corona virus, to say things are uncertain here in the US feels an understatement. But we have weathered crises before – as societies, communities, and in our personal lives. Overcoming them is never easy, but perhaps we, too, can learn from our past to find new ways forward. Indeed, as with my own view of the value and use of history to address contemporary challenges, it is less about going backwards, and more about the information needed to go forwards successfully. With that in mind, how we can restore the aspects of our lives that may be missing, but in our new normal?

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OCEANS PAST SPOTLIGHT*

10 Questions: Dr. Philine zu Ermgassen
(Native Oyster Restoration Alliance)

Q1. First – a brief introduction: can you describe your research in two sentences or less?

Oysters! By that I mean the habitats they create, although often most of the data we can examine is fisheries related.

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

Oysters are largely extirpated as a habitat. In many cases even to the point where they are no longer identified with culturally in the coastal communities they previously nourished. While I am a scientist by training, and my approach to historical ecology is driven by that, it is the human connections that can be unearthed from history that I find resonate so well with people today. For a nearly extirpated, largely subtidal habitat, history is the key to introducing a wide range of stakeholders and funders to this important, biodiverse, and ecosystem-service-rich habitat. On top of that, I personally find it fascinating.

Q3. Was there a person or event that was particularly influential on your interest in history and historical ecosystems?

I would say if I had to pick on moment, it was probably reading the following when examining the second report of **Eugene G. Blackford** to the New York (USA) assembly on January 20, 1887. Blackford was the US Commissioner of Fisheries, as well as in charge of the oyster investigation and oyster territory survey, for the years 1885 and 1886 at the Natural History Museum Library in London. “Dredged seventy-five yards, found a roller skate, bottles, ashes, pasteboard, refuse, eight large oysters and a peck of small seed”. It had never even occurred to me that roller skates had actually been invented in the 1800s. I like that the sentence actually conveys quite a lot of information. We know the vague location of the dredge tow, the distance towed, and the count of oysters. While there are many more dire descriptions of slime, dead oysters and oily refuse, and more measured quantitative counts, tows, and areas listed throughout the report, this sentence struck me as having a particularly enjoyable human element. I have relayed it to friends and colleagues and this description always seems to amuse and draw people in, helping them to understand the frankly shocking state of the Hudson River in the 1880s.

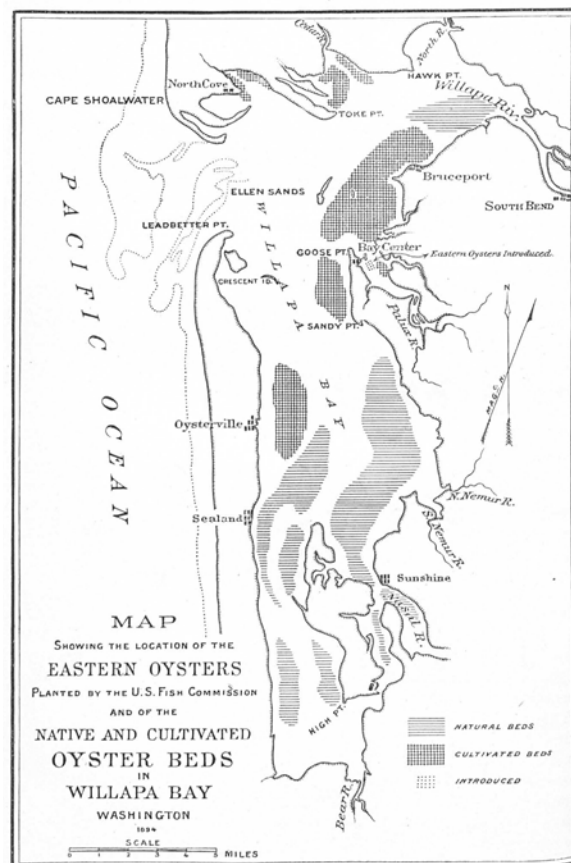
Q4. What advice would you give those who want to engage in historical work or collaborate with our community?

Have patience and don't be afraid to get lost in the past - at least for a while. My scientific training always leads me to a data extraction approach to historical ecology, and while telling the story in that way is in my opinion critical, stories and images from the past allow new audiences to be drawn in and provides context to the raw numbers. The context should, however, also be critically assessed. Therefore, I'd also add “Don't believe everything you read.”

I guess the flip side of getting lost in the past is that it is important to budget enough time to get the most out of historical texts. Collaborations can really help in that regard, especially as no one person is an expert on every area and collaborations can really unlock a lot of data. The current effort being led by **Dr. Ruth Thurstan** with the **Native Oyster Restoration Alliance Historical Ecology Group** is a shining example of that [more on Dr. Thurstan and the NORA under Collaborations, below].

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

Absolutely. It is my primary motivation for doing historical ecology. In my main field of research, marine habitat restoration, the use of historical ecology in site selection and public engagement is widely accepted. Information from the past is used to map out where and what may be achievable in the future, whereas an understanding of the historical significance of the species and habitat is critical in public and stakeholder engagement.



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

Marine habitat restoration! Restoration of marine habitats is coming on leaps and bounds. Whether it is seagrass, oyster reefs, saltmarsh, mangroves, or kelp beds, the scope and scale of restoration is growing. The evidence base for the positive benefits of restoration is also increasing, which is critical in unlocking the funding to support it. All in all, I see marine restoration, coupled with marine protection, as a hugely positive force in the future.

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

I hope that the next generation can find out first-hand how vibrant, healthy and valuable our coastal ecosystems can be once they are restored. With historical ecological data contributing to decision making and outreach, there is every chance that this could become a reality.

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

Deep sea marine ecology. I find it fascinating that there is still so much we do not know about the ocean deep and tragic that we are so capable of impacting so much of those fragile ecosystems.



RESEARCH NEWS

Charting past distributions of native oyster beds in the North Sea. Flat oysters, *Ostrea edulis*, are Europe's native oyster species, and have been highly prized by society for centuries, owing to their well-known culinary qualities. However, they are also known to have suffered substantial habitat losses. Two centuries ago, extensive beds of flat oysters populated both shallow, coastal areas of Europe as well as deeper, offshore waters. The largest of these 'deep water' flat oyster beds were in the central North Sea, where the species played a key ecological role. Intensive exploitation of these beds began in the 1880s, when especially fishermen from Brightlingsea and Grimsby in England, and from Hamburg in Germany, extended their trawling further offshore, aided by improved sailing vessels (Fig 1). Within two decades, depletion was evident, and oyster trawling stopped at the onset of World War I. Thereafter, large-scale trawling of the same areas for fish prevented any natural recovery. Today, there is rising interest in repopulating North Sea areas with flat oyster beds - for such projects to be successful, information on the conditions under which oysters grew, reproduced and thrived in the past is indispensable.

Our new paper is based on historical texts, 19th century maps, and trawling data from the early 20th century collected onboard the early research vessels *Huxley*, *Wodan* and *Poseidon*. Together, this information allowed us to delineate former flat oyster bed areas in the central North Sea (Fig 2), which was considerably larger than typically assumed in current studies based on a single, frequently cited historical 'Oyster Map' by **O.T. Olsen** (1881). Our analysis of ecological conditions revealed that oysters beds were not present in the 'dynamic sandy areas', but merely confined to the 'low energy' muddy areas, and the apparent disappearance of cold water adapted flat oysters. Our paper

Q9. *What are you reading at the moment?*

The Great Gatsby by **F. Scott Fitzgerald**. It is my first reading of this classic after a friend sent it to me when I asked for a good book recommendation. So far, I am greatly enjoying it and looking forward to what I can learn.

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

How can marine historical ecology best be communicated to a greater diversity of people? This is a topic that conservation science in general has to grapple with. Historical ecology has the potential to be a gateway to a broader range of stakeholder groups engaging with conservation science, but it has to be communicated in an engaging and accessible way. How can planned and existing projects best achieve this aim?

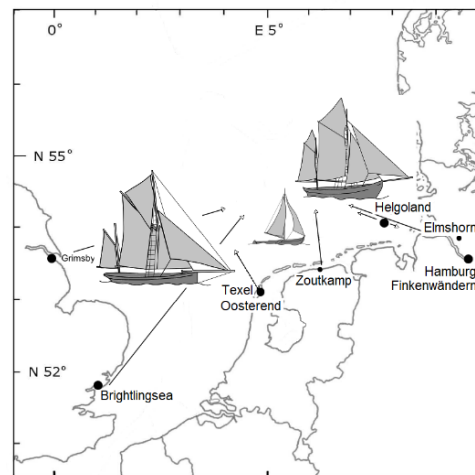
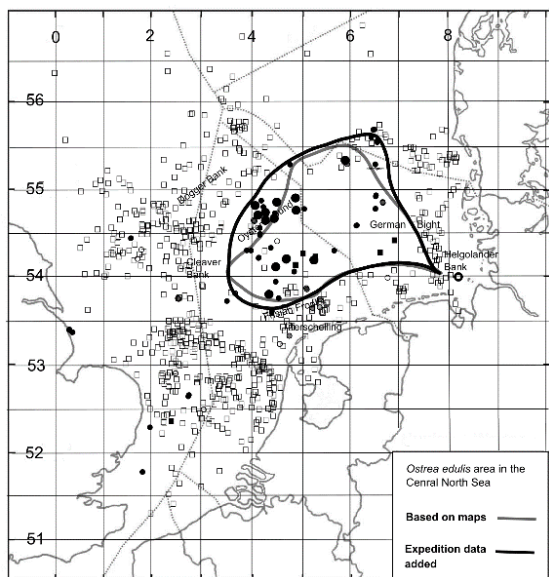


Figure 1. Late 19th century flat oyster trawling in the North Sea.



piqued the interest of several oyster recovery initiatives, including the **Native Oyster Restoration Alliance (NORA)** European Network, and **De Rijke Noordzee** in the Netherlands, and is currently being reviewed in the context of MPA planning within the North Sea. This work demonstrates that marine historical ecology is not just about what happened long ago; it can clearly help inform what society is interested in right now. ~ Floris P. Bennema & Georg H. Engelhard. *Publication: Ostrea edulis beds in the central North Sea: delineation, ecology and restoration. ICES Journal of Marine Science. doi.org/10.1093/icesjms/fsaa134.*

Figure 2. Early 20th century trawl survey stations (black, oysters recorded; white, no oysters observed), which helped inform the delineation of historical oyster beds.

Zooarchaeology and the conservation of Brazilian coastal-marine ecosystems. Along the Atlantic coast of Brazil, pre-Columbian people in the Middle and Late Holocene left behind archaeological shell mounds and middens, known as *sambaquis*. Sambaquis have recognized cultural value, as well as being vital biological archives for tracking changes in past biodiversity and informing modern conservation studies and management. The authors reviewed the published record of faunal remains from archaeological sites located in Babitonga Bay, in the state of Santa Catarina, southern Brazil. From 110 such sites, they used assembled a comprehensive survey of terrestrial and marine taxa exploited by human groups in the region between ca. 5500 and 370 years ago. A total of 244 species were recorded, of which 14 are currently endangered - and 12 no longer present. This zooarchaeological synthesis provides snapshots of past biodiversity, adding a novel contribution to current debates around the conservation biology of one of the world's most threatened tropical biomes. *Publication: Fossile T, Ferreira J, da Rocha Bandeira D, Dias-da-Silva S, Colonese AC. "Integrating zooarchaeology in the conservation of coastal-marine ecosystems in Brazil". Quaternary International 545: 38-44. <https://doi.org/10.1016/j.quaint.2019.04.022>.*

Fish in a barrel: Atlantic sturgeon and economic power. In 2019, archaeological excavations of the royal Danish ship *Gribshunden*, which sank in the Baltic Sea in 1495, unearthed a wooden barrel submerged inside the shipwreck, and which included well-preserved fish remains. Using morphology and ancient DNA analysis, researchers identified at least one Atlantic sturgeon (*Acipenser oxyrinchus*). The authors further examined butchery marks, using these to determine the sturgeon was chopped to larger pieces before being placed in the wooden barrel and stored in the hold of *Gribshunden*. The *Gribshunden* sturgeon is among the first examples derived from an underwater context, at least in the Baltic Sea, and the sheer quantity of the remains as well as its high contextual integrity is unique for Scandinavian context as well. Sturgeon were of high value during the late medieval period – and the *Gribshunden* was a royal flagship. The Danish King Hans was onboard the ship, on his way to Kalmar for a diplomatic summit to claim the Swedish throne. Therefore, the ship carried valuable cargo, including the sturgeon, intended to impress the Swedish noblemen awaiting the king. Collectively, this work combines aDNA and other identification techniques alongside history to illuminate archaeological finds, but also to place them in important historical context – denoting not only fishery cargo, but also that fish as a luxury item used to signal economic power. *Publication: Macheridis S, Hansson MC, Foley BP (2020). Fish in a barrel: Atlantic sturgeon (Acipenser oxyrinchus) from the Baltic Sea wreck of the royal Danish flagship Gribshunden (1495). Journal of Archaeological Science: Reports 33.*



Figure 2 from the paper: Barrel A42 in situ during excavation (27th of August 2019). The barrel's location and a large dorsal scute just outside of the barrel are indicated by blue arrows.

Research further uncovers historical ecology of the iconic Angelshark in the southern North Sea – and its demise. Using historical books and catch records of 104 Dutch individuals, researchers revealed both the previous abundance, ecology, and demise of an iconic species, the critically endangered angelshark, *Squatina squatina*, in the southern North Sea. The authors revealed that angelsharks were once annual visitors to the North Sea, and from 1600 and 1950 were sometimes commonly observed. They found recorded individuals peaked in the early twentieth century and between 1945 and 1955 – and declined rapidly in the 1960s, coinciding with the introduction of engine-powered fisheries, and full extirpation following the increased use of diesel-powered beam-trawlers. The last recorded observation of an angelshark was in 1973. The study also provided biological insight. Angelsharks were most commonly recorded as observed in summer season, in accordance with the prevailing notion of Angelsharks migrating to warmer waters in winter, and that the highest catches in shallow waters were of newborns and adult females, denoting the importance of the area for parturition and nursery. Collectively, the review exemplifies how a large predator disappeared from a marine food web, as well as the importance of historical data to deduce the natural richness of the North Sea. Given the growing call to restore the natural richness of the North Sea, the authors contend their study indicates this call can often be unclear on what that natural richness actually was. *Publication: Bom RA, van de Water M, Camphuysen KCJ, van der Veer HW & van Leeuwen A (2020). Marine Biology 167: 91.*

RECENT PUBLICATIONS

New Coastal History Collection in *Arcadia Environment and Society Portal*. Coastal History is now the theme of a new collection of articles at *Arcadia: Explorations in Environmental History*. *Arcadia*, a project of the **Rachel Carson Center for Environment and Society**, a joint initiative of **LMU Munich** and the **Deutsches Museum**, is an open-access, peer-reviewed journal that publishes short compelling environmental histories. The Coastal History Collection is curated by **Isaac Land** (Indiana State University, USA) and **Joana Gaspar de Freitas** (University of Lisbon, Portugal). In recent years, historians have proposed a host of new conceptual frameworks in this general area, from **Michael Pearson's** "*littoral societies*," **Isaac Land's** "*coastal history*," **Alison Bashford's** "*terraqueous history*," and **John Gillis's** discussion of the ecotone in *The Human Shore*. But there remains a fresh, open debate about what Coastal History might include. It is especially well-suited to investigating the range of subject matter that is sometimes overlooked as "*not-quite-oceanic*," yet "*not-quite-terrestrial*." Its ambition is to embrace the entire array of human or more-than-human elements imbricated in these hybrid spaces, of shallow waters, interstitial watery realms and adjacent lands.



Icarai Beach in Brazil (Photo: Joana Freitas).

The collection kicked off in October 2020 with a compilation of articles already in the *Arcadia* archives connected to the theme, but new submissions are welcome. Anthropocene coasts, in particular, present interpretive challenges as heavily engineered environments where human and natural agencies exist in a state of dynamic tension. Whether or not coasts can ever be managed, or sea level rise mitigated, it is impossible to study shorelines today without confronting fundamental questions of value, meaning, responsibility, praxis, and social justice in a time of global crisis. *The collection can be accessed at www.environmentandsociety.org/arcadia/collection/17807, and the call for contributing papers at www.environmentandsociety.org/arcadia/contribution.*

Aswani S (2020). **New Directions in Maritime and Fisheries Anthropology**. *American Anthropologist* 122(3): 473-486. <https://doi.org/10.1111/aman.13380>.

Bartosiewicz L, Haidvogel G, and Bonsall C (2019). **Archeozoological and Historical Data on Sturgeon Fishing along the Danube**. *Zooarchaeology* 3, 59-71.

Bas M, Salemme M, Green EJ, Santiago F, Speller C, Álvarez M, i Godino IB, and Luis Cardona L (2020). **Predicting habitat use by the Argentine hake *Merluccius hubbsi* in a warmer world: inferences from the Middle Holocene**. *Oecologia* 193: 461-474. <https://doi.org/10.1007/s00442-020-04667-z>.

Bennema FP, Engelhard GH, and Lindeboom H. (2020). ***Ostrea edulis* beds in the central North Sea: delineation, ecology and restoration**. *ICES Journal of Marine Science*: <https://doi.org/10.1093/icesjms/fsaa134>.

Bom RA, van de Water M, Camphuysen KCJ, van der Veer HW & van Leeuwen A (2020). **The historical ecology and demise of the iconic Angelshark *Squatina squatina* in the southern North Sea**. *Marine Biology* 167: 91.

Colloca F, Carrozzini V, Simonetti A, & Di Lorenzo M (2020). **Using local ecological knowledge of fishers to reconstruct abundance trends of elasmobranch populations, Strait of Sicily**. *Front. Mar. Sci.* doi.org/10.3389/fmars.2020.00508.

Fossile T, Ferreira J, da Rocha Bandeira D, Dias-da-Silva S, Colonese AC (2020). **Integrating zooarchaeology in the conservation of coastal-marine ecosystems in Brazil**. *Quat. Int.* 545: 38-44. doi.org/10.1016/j.quaint.2019.04.022.

France, RL (2020). **From Cryptozoology to Conservation Biology: An Earlier Baseline for Entanglement of Marine Fauna in the Western Pacific Revealed from Historic "Sea Serpent" Sightings**. *Advances in Historical Studies* 9(2).

Handley SJ, Swales A, Horrocks M, Gibbs M, Carter M, Ovenden R, and Stead J (2020). **Historic and contemporary anthropogenic effects on granulometry & species composition detected from sediment cores & death assemblages, Nelson Bays, Aotearoa-New Zealand**. *Cont. Shelf Res.* 202(1). doi.org/10.1016/j.csr.2020.104147.

Lidström S, Sörlin S and Svedäng H (2020). **Decline and diversity in Swedish seas: Environmental narratives in marine history, science and policy.** *Ambio* 49: 1114–1121. <https://doi.org/10.1007/s13280-019-01247-1>.

Macheridis S, Hansson MC, Foley BP (2020). **Fish in a barrel: Atlantic sturgeon (*Acipenser oxyrinchus*) from the Baltic Sea wreck of the royal Danish flagship Gribshunden (1495).** *Journal of Archaeological Science: Reports* 33. <https://www.sciencedirect.com/science/article/pii/S2352409X20302716>.

Olukoju A and Castillo Hidalgo D eds (2020). **African Seaports and Maritime Economics in Historical Perspective.** Springer Nature. <https://doi.org/10.1007/978-3-030-41399-6>.

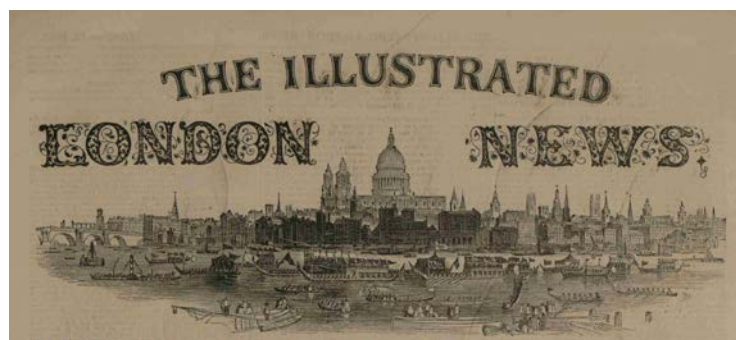
Punzón A, Rueda L, Rodríguez-Basalo A, Hidalgo M, Oliver P, Castro J, Gil J, Esteban A, de Sola LG, Massutí E (2020). **History of the Spanish demersal fishery in the Atlantic and Mediterranean Seas.** *ICES Journal of Marine Science* 77(2): 553–566. <https://doi.org/10.1093/icesjms/fsz231>.

What is maritime history? (2020). Forum in *International Journal of Maritime History* 32(2): <https://journals.sagepub.com/toc/ijh/32/2>.

Sanchez GM (2020) **Indigenous stewardship of marine and estuarine fisheries?: Reconstructing the ancient size of Pacific herring through linear regression models.** *Journal of Archaeological Science*. 29: 102061. <https://doi.org/10.1016/j.jasrep.2019.102061>.

ANNOUNCEMENTS: COLLABORATIONS

Seeking collaborators to develop the historical ecology of the European native oyster. The **Native Oyster Restoration Alliance (NORA)** has recently established a **Historical Ecology Working Group**. Expressions of interest are sought for those from a range of disciplinary backgrounds who might consider contributing some of their time and expertise to developing a sound quantitative and qualitative assessment of the native oyster (*Ostrea edulis*) in Europe. The project will result in at least one peer reviewed publication and short report which will benefit those seeking to engage with new stakeholders for restoration, with developing funding bids, with site selection, as well as with broader outreach about the historical importance of native oysters. You will join a diverse group of experts with a common interest. Additional collaborators from across Europe are invited to take part to pull together data from scattered archives, historical news reports, naturalists reports and other sources from across the native range of the species. We hope you can join us! If you are interested in finding out more about the project and what it entails, please contact **Ruth Thurstan**, r.thurstan@exeter.ac.uk.



Opening of the Billingsgate Oyster Market in 1843

Call for Conservation Paleobiology Working Groups pre-proposals. We are currently accepting pre-proposals for **Conservation Paleobiology Network (CPN)** Working Groups. Submission deadline is January 8th, 2021. The CPN will sponsor working groups focused on research questions that integrate conservation paleobiologists, academic partners, wildlife managers, and stakeholders to develop effective strategies for translating products of historical research into conservation and management actions. Each working group will include up to three multi-day meetings to develop approaches to research or applications. Working groups should engage key interest groups (conservation paleobiologists, archaeologists, environmental historians, federal and state management officers, and stakeholders), tackle problems that focus on one or more species, habitats, or organismal groups, and provide a clear vision of outcomes that will contribute to the broader mission of the CPN of establishing conservation paleobiology as both a basic and applied discipline. More information at: <https://conservationpaleorcn.org/working-groups/>.

New team gains support to study to maritime history and archaeology. A team of maritime historians and archaeologists have been awarded €10.5 million by the *European Research Council* (ERC) to assess the importance of marine life to human societies during the last two millennia. The **4-OCEANS** team is comprised of **Poul Holm** and **Francis Ludlow** from Trinity College (Ireland), **James Barrett**, University of Cambridge (UK), and **Cristina Brito**, of NOVA University (Portugal). The project will kick off in July 2021 and last six years. It aims to assess the importance of marine life for human societies during the last two millennia, from 100 BCE to 1860 CE; how selected major socio-economic, cultural, and environmental forces constrained or enabled marine exploitation; and identify the consequences of marine resource exploitation for societal development. One of the outputs will be the creation of an online World Atlas of Historical Marine Exploitation. ERC Synergy Grants support research challenges that can only be tackled by collaborative approaches spanning multiple disciplines. The project will bring together expertise in marine environmental history, climate history, natural history, geography, historical ecology and zooarchaeology.

ANNOUNCEMENTS: PhD OPPORTUNIES

The **Water and Environmental Research Center** at **University of Alaska Fairbanks** has two funded PhD positions in isotope geochemistry and paleoecology, and the research team seeks students who are interested in interdisciplinary research. One position will research mercury and isotopes in historical/archaeological bone of pinnipeds and fish, on a project that includes marine science, marine mammal science, fisheries, archaeology, iso- and bio-geochemistry, and biology. Remote archaeological field work in the Aleutian Islands is planned for summer 2021 or Summer 2022. This is a funded NSF cross-program project within the Polar Programs Division: “*Mercury dynamics from the Holocene to the Anthropocene: Tracking Aleutian mercury in ocean species important to Native Alaskan diets*”. The second position will be a part of a fisheries and paleoecology project researching isotopes in Atlantic cod from Icelandic archaeological sites, and involves cod bone and otoliths and bulk and compound specific amino acid stable isotope analyses. The project includes marine science, fisheries, archaeology, and isotope geochemistry. If you are interested in applying to be a part of the research project, please contact **Nicole Misarti** (nmisarti@alaska.edu) to learn more about the projects and discuss possible departmental affiliations as soon as possible.

ANNOUNCEMENTS: CONFERENCES

Open call for Oceans Past Workshops 2021. The **Oceans Past Initiative** is excited to announce they are planning a programme of online workshops to be held throughout 2021! These will be in place of the annual conference, which will now be held in-person in 2022. These workshops will be focused upon specific problems and research areas that cater for the diverse interests of the OPI membership. If you are interested in organising an online workshop on a particular topic, please get in touch at info@oceanspast.org and we will facilitate the inclusion of your workshop in the 2021 programme. We welcome workshop ideas that aim to explore new topics, create novel collaborations, foster research outputs, or that engage new perspectives on previously completed research.

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-January 2021. We warmly welcome submissions through the end of 2020.

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](https://twitter.com/oceans_past)