NEWSLETTER

VOLUME 24 | Apr 2022

OPI

OCEANS PAST INITIATIVE

OCEANS PAST NEWS No.24

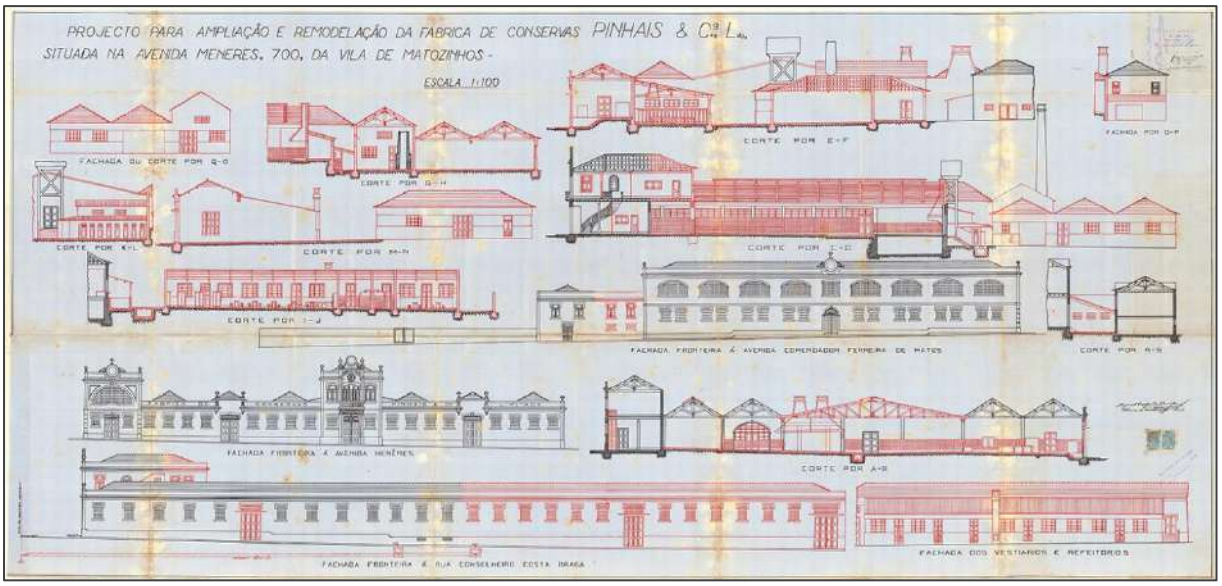
SPRING 2022

OCEANS PAST INITIATIVE

Our global community.

Russian's invasion of Ukraine continues. I think often of our Ukrainian colleagues, of their families and friends and loved ones. I also think of our European colleagues, opening their doors to welcome strangers. I think of our Russian colleagues, who may be silenced or fleeing. But I also remember conflict close to my Western world should not encourage me to forget other conflicts abroad, and my colleagues around the world facing violence and fleeing their homes. May we all know peace and kindness, may we all practice patience and compassion.

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



Project for Pinhais cannery expansion approved in 1945 (Matosinhos' Municipality Historical Archive)

OCEANS PAST SPOTLIGHT*

Sardines and architecture

André Tavares & Diego Inglez de Souza;
Arquiteto, Urbanista e Pós-Doutorando, fishingarchitecture.com

Architecture might not seem the most obvious discipline to understand the oceans past. But once we think of marine ecosystems and people, the constructions built to support fisheries tell of the complex dynamics underlying a process that is in permanent flux. Our research aims to tackle these uncharted architectural connections: How can we represent the intricate relationship between the sea and the shore? How large a school of sardines does a canning factory process in one day? What ecological impacts do onshore construction have on marine systems?

† 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.*

As architects, we can help foster a more balanced relationship between humans as predators and other species. We coined the term "**Fishing Architecture**" to build a bridge between marine biology and architecture, drawing on sources as disparate as the urban remnants of canning factories and port constructions (architecture *per se*), governmental reports (providing figures on fish landings and political strategies), municipal archives (with holdings on cartography and architectural projects), trade magazines (covering fishery practices and views), literature and photography (representing architecture), and scholarly research (on marine biology).

At the 2021 ICES Annual Science Conference, we presented initial results of a specific case study on the relationship between sardines and the urban development of Matosinhos on the coast of northern Portugal. In the late nineteenth century, this area underwent large-scale industrial expansion when the port of Porto was relocated to the mouth of the river Leça, providing a safe harbour for larger boats. The move was followed by infrastructural and urban developments to support a bourgeoning canning industry. However, the location and expansion of canning factories were less driven by a formal planning process. Instead, we argue they are more strongly impacted by environmental factors. For example, the Portuguese coast is subject to powerful upwelling, favoring pelagic fish, such as sardines — and cannery growth paralleled an inefficient appraisal of local ecological conditions. While the industry had a fixed share of daily production and annual output, fishermen were unable to predict daily catches and regular landings throughout the year. This mismatch led to an ongoing "sardine crisis" in the region.

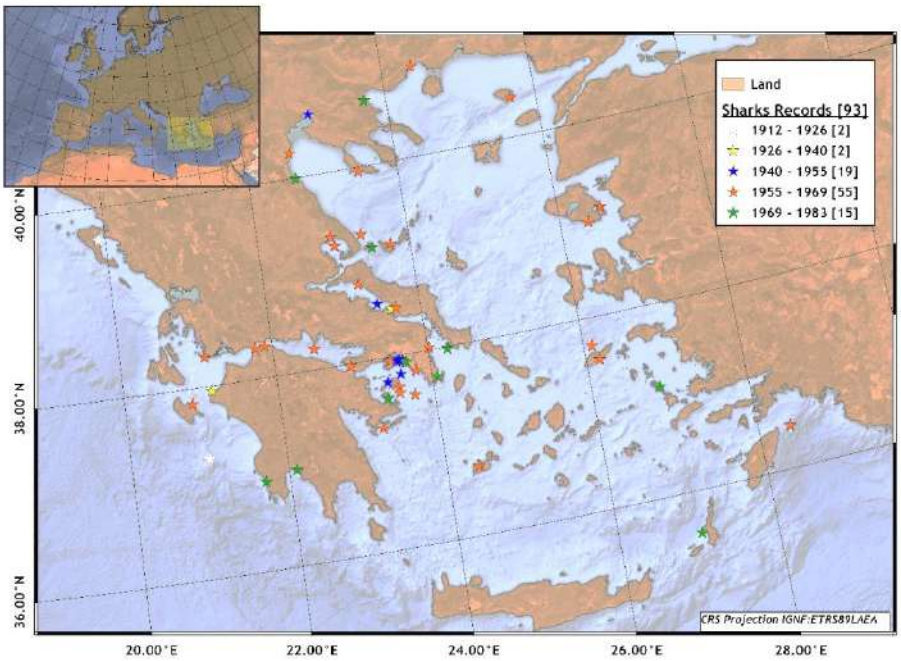
Statistical data demonstrates how closely canning infrastructure worked to meet biological production. Such data from 1944 to 1946 reveals there were forty-seven active canneries in Matosinhos, when the city was the leading European port exporting canned sardines. One telling example is the Pinhais cannery, which had a significant extension to its premises approved in 1945. The fact that Pinhais is still operating in the same facilities with the same technological processes offers a unique standpoint from which to assess the ecological pressure of a precise architectural design. This factory processes about 60–100,000 sardines per day, a quantity that seems close to the estimated numbers of a medium-size sardine school, fitting approximately within a large purse-seine net. Despite the provisional nature of the data collected, the proportional relationship between the size of a sardine school off the Portuguese shore and the dimensions of a factory are surprisingly related. This relationship between the factory and the school is intriguing: it seems that the building was designed to process approximately one sardine school per day.

Relation between Pinhais cannery processing capacity and the average size of a sardine school in Northern Portugal (Fishing Architecture, 2022)

Our research on fishing architecture is still in its early stages, but it aims to explore the possibility of reading architecture and urbanism in relation to different biological data. In doing so, we can trace the connections between building practices and marine biology and arrive at a more informed assessment of architecture's socio-ecological impact, thus shining new light on the relationship between urban transformations, working waterfronts, and the sea and shore continuum.

RESEARCH NEWS

Unravelling "beasts" in early 20th century Greek fisheries. Historical anecdotal data can improve understanding of past dynamics, enabling us to determine whether contemporary systems are acting within the historical range of variability exhibited before large-scale human impacts. Although sharks are today a hot topic, information on their presence, distribution, and status, especially in the past and in the Eastern Mediterranean, is limited - undermining their management and protection. We conducted an exhaustive review of references related to shark presence during the early Greek fisheries period (first half of the 20th century) and searched traditional and digital libraries



References on sightings indicating the presence of sharks during the early fisheries period of the Greek fisheries.

using a multi-level thematic approach across anthropology, sociology, history and fisheries sciences on Greek fisheries and marine organisms. A resulting significant contribution was made to the newspaper collection of the National Library of Greece (https://bit.ly/3vJ7vAm) covering both the Athenian and provincial press.

Our search revealed that large, charismatic species were common in the Greek Seas, a phenomenon not suspected from modern fishery surveys. A key message of our study is that during early modern fishing period in Greece, shark presence was a major problem for coastal communities - with the proposed solutions now considered illegal and socially unacceptable.

In the early 20th century, the first record on the presence of a large shark (20m in length) was reported in the North Ionian Sea in 1913 (see figure). Shark sightings gradually increased to 1969, with more frequent records in the Aegean Sea. Shark presence then declined to the mid-1980s (figure). A key fact in our findings is a high number of these observations stemming from shark attacks on humans. As shark attacks are not currently a problem, this suggests a lower abundance in modern times. In addition, in the past, these events resulted in calls for the culling of sharks, requests for permission to hunt sharks with firearms, and offering rewards for killed individuals. The protection of sharks is supported by a variety of legal provisions both national and European, but locally is far from being taken for granted, as indicated by the delay in time by which these laws are enacted and/or ratified, as well as the lack of enforcement and compliance by professionals.

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Pair of papers uncover new data and insight on Mediterranean swordfish. MacKenzie and collagues published two papers demonstrating the value of historical data to contemporary marine management and science. Modern data sets often offer limited temporal coverage, often far shorter than the history of human impact on many populations and ecosystems, especially for the largest and commercially most valuable species. In the first paper, the authors hypothesized that historical trap fishery records for bluefin tuna (*Thunnus thynnus*) could contain information for other bycatch species, such as swordfish (*Xiphias gladius*). Swordfish have a long history of exploitation and are presently overexploited, but fishery management indicators only start in 1950. The authors examined historical tuna fishery records and logbooks, recovering previously neglected but detailed data on bycatch going back over 100 years (1896–2010), a time period before and after major expansion of swordfish fisheries in the Mediterranean Sea. The datasets - available at scales of high time–space–biological resolution (i.e., sub-weekly, sub-regional sea; individual weights) - are online and available with open access via three DOIs, as described in the article.

In the second paper, the authors analyze the recovered bycatch data on swordfish to illuminate how humans and nature affect dynamics at multi-decadal time scales. The detail available in the datasets allowed different ecological questions to be addressed than is possible with coarsely scaled data (e.g., annually resolved total catches aggregated over large sea areas). They were able to construct regional indicators of population status for most of the 20th

century, and pre-dating other population information by 50–70 years. This uncovered significant multi-annual/ decadal variations in abundance and mean weight not detectable in shorter, more recent time series.

Such historical datasets can help understand how human activities and natural variability interact to affect the long-term dynamics of species. This work used such term data to improve knowledge of Medi-terranean swordfish ecology. The findings provide a basis on which further historical data recovery and analysis of contemporary data can provide new perspectives and opportunities for quantifying vulnerability of populations to exploitation and climate change. *Publications: MacKenzie BR, Romeo T, Addis P, Battaglia P, Consoli P, Andaloro F, Sara G. 2021. New historical data for long-term swordfish ecological studies in the Mediterranean Sea* Earth Syst. Sci. Data. 13:5867–5877; *MacKenzie BR, Addis P, Battaglia P, Consoli P, Andaloro F, Sara G, Nielsen A, Romeo T. 2022. Neglected fishery data sources as indicators of preindustrial ecological properties of Mediterranean swordfish.* Fish Fish.

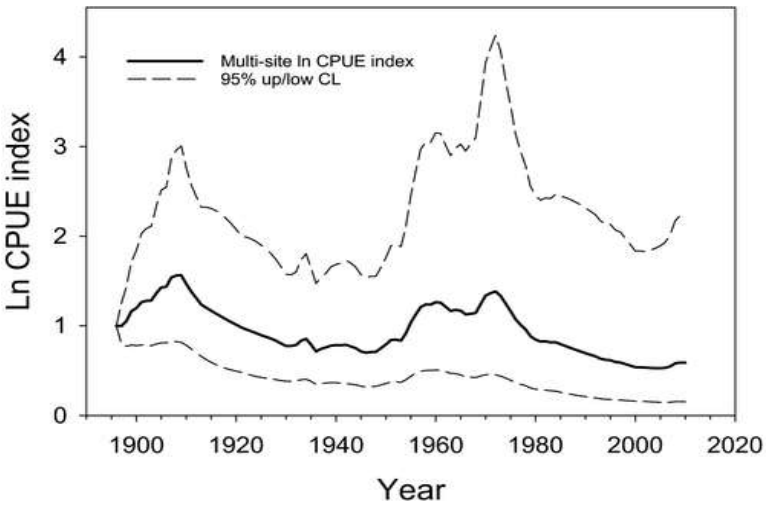
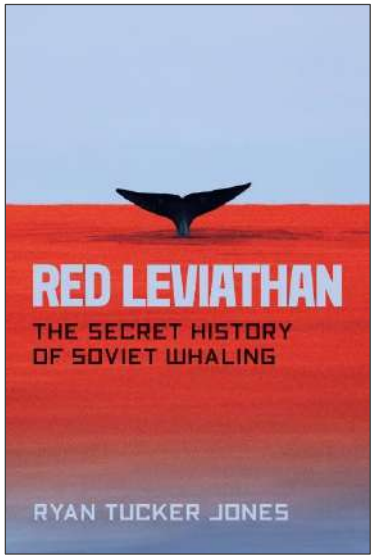


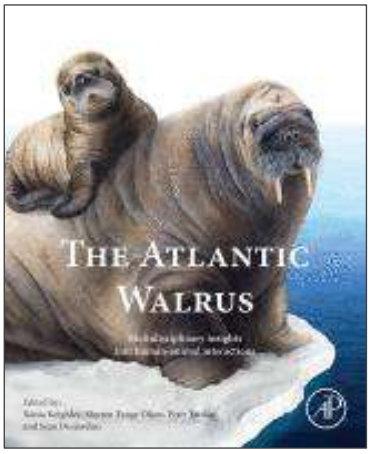
Fig 4 from the 2nd paper: Long-term inter-annual variability in a multi-site index (with 95% confidence limits) of swordfish abundance the Tyrrhenian Sea-Strait of Messina area, 1896–2010. The index is based on a random walk time series analysis of swordfish bycatches in four bluefin tuna traps in Italy.

RECENT PUBLICATIONS



Red Leviathan: The Secret History of Soviet Whaling. In his new book, Ryan Tucker Jones shows how Soviet whalers secretly helped nearly destroy endangered whale populations, while also contributing to the scientific understanding necessary for these creatures' salvation. Based on formerly secret Soviet archives and interviews with ex-whalers, the book offers a complete history of the role the Soviet Union played in the whales' destruction. Cold War intrigue encouraged this destruction, but, as Jones shows, there is a more complex history behind this tragic Soviet experiment. Jones compellingly describes the ultimate scientific irony: today's cetacean studies benefited from Soviet whaling, as Russian scientists on whaling vessels made key breakthroughs in understanding whale natural history and behavior. Finally, *Red Leviathan* reveals how the Soviet public began turning against their own country's whaling industry, working in parallel with Western environmental organizations like Greenpeace to help end industrial whaling before the world's whales disappeared altogether. https://press.uchicago.edu/ucp/books/book/chicago/R/bo137529766.html.

The Atlantic Walrus: Multidisciplinary insights into human-animal interactions addresses the key dimensions of long-term human walrus interactions across the Atlantic Arctic and subarctic regions, over the past millennia. This book brings together research from across the social and natural sciences to explore walrus biology, human culture, environmental conditions and their reciprocal effects. It discusses walrus evolution and biology, the cultural significance and ecological impact of prehistoric and indigenous hunting practices, as well as the effects of commercial hunting and international trade – and examines historic and ongoing management strategies and the importance of new research that reveal new details of the past. The work concludes by discussing the future for Atlantic walruses in the face of climate change and increased human activities in the Arctic. Edited by X. Keighley, Xénia, MT Olsen, PD Jordan, and SPA Desjardins: https://www.sciencedirect.com/book/9780128174302/the-atlantic-walrus.



Kleiven AF, Espeland SE, Stiansen S, Ono K, Zimmermann F, Olsen EM. 2022. **Technological creep masks continued decline in a lobster (*Homarus gammarus*) fishery over a century**. *Sci Rep* 12: 3318. https://doi.org/10.1038/s41598-022-07293-2.

MacKenzie BR, Romeo T, Addis P, Battaglia P, Consoli P, Andaloro F, Sara G. 2021. **A new historical dataset for long-term swordfish ecological studies in the Mediterranean Sea**. *Earth Syst. Sci. Dat*. 13, 5867–5877.

MacKenzie BR, Addis P, Battaglia P, Consoli P, Andaloro F, Sara G, Nielsen A, Romeo T. (2022). **Neglected fishery data sources as indicators of preindustrial ecological properties of Mediterranean swordfish**. *Fish Fish*. https://doi.org/DOI: 10.1111/faf.12651.

Sodeland M, Jentoft S, Jordeb PE, Mattingsdal M, Albretsen J, Kleiven AR, Warøy Synnes A-E, Espeland SH, Olsen EM, Andre C, Stenseth NC, Knutsen H. 2022. **Stabilizing selection on Atlantic cod supergenes through a millennium of extensive exploitation**. *PNAS* 119 (8). https://doi.org/10.1073/pnas.2114904119.

ANNOUNCEMENTS: CONFERENCES

ESSAS and Oceans Past Initiative joint conferences. Registration is now open for the **Oceans Past IX conference**, which will take place **22-25 June 2022** at the University of Washington in Seattle, WA. Participants can choose to attend in person or online, and have the opportunity to also attend the **Ecosystem of Subarctic Seas Annual Science** (ESSAS) meeting, taking place 19-22 June, at a greatly reduced rate. More information including links to registration can be found at https://oceanspast.org/opix.php. Also note there is an option to reserve lodging on the University campus at a markedly reduced rate compared to equivalent lodging options. Priority lodging for reservations by **MAY 10** (our final opportunity to adjust the size of the Room Block). After that date available rooms may continue to be reserved until June 3, 2022. University room availability is limited so interested participants need to move quickly.

Third meeting to focus on people's entanglement with nature. The Centre for History (CH-U Lisboa) of the University of Lisbon, the Centre for the Humanities (CHAM) of the NOVA University of Lisbon and the Centre for Administration and Public Policies (CAPP) of the University of Lisbon are pleased to be hosting the **International Meeting Histories of Nature and Environments: More Than Just Biodiversity** from the 24th to the 26th November 2022. The meeting will take place in Peniche with the support of the City Hall. Ecocultural systems, or integrated 'natureculture' views, will be the main object of our discussions, considering that different species, both human and non-human, and their interrelationships, can be placed at the centre of the debate and be discussed as agents in historical and current narratives. We are welcoming contributions from early stage to senior researchers, as well as from people outside academia. The conference will be held in English, and proposals are due **May 15, 2022** to ihnemeeting3@gmail.com. More information at https://hnemeeting3.wordpress.com/.

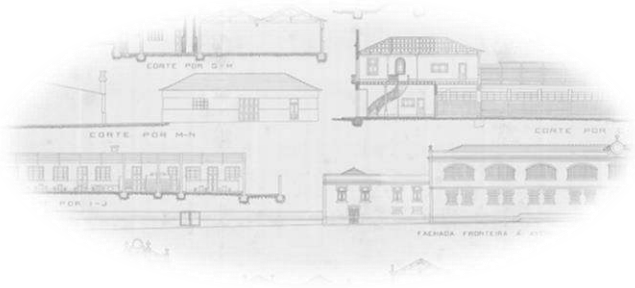
INQUA, International Union for Quaternary Research will be holding its XXI Congress in **Rome 14-20 July 2023**. Please see the website for more information: https://inquaroma2023.org/

Save the Date: The **2nd Conservation Paleobiology Symposium** will be held **Feb 16-19, 2023,** in Gainesville, Florida (USA). More information about abstract deadlines and registration will be forthcoming.

OTHER ANNOUNCEMENTS:

Q-MARE Seminar Series launches. Each month Q-Mare will host a public online seminar on topics dealing with the timing and scale of human impacts in marine ecosystems over millennia. Our inaugural seminar will be given by Dr. Susan Kidwell on: "Where we are and what's next in understanding the nature of ordinary shallow-marine fossil records". Sue's seminar will be on the **4th May, 10am CDT**. More at https://pastglobalchanges.org/calendar/129114.

New working group on historical data and coral reef management. A new Conservation Paleobiology Network Working Group, **Integrating Paleo and Historical Data into Coral Reef Management and Policy**, is kicking off, led by principal investigators Katie Cramer and Loren McClenachan. Studies using paleoecological and historical data can inform coral reef management and policy by providing accurate ecological baselines and by pinpointing the timing, magnitude, and drivers of ecosystem declines. Yet this potential is rarely realized. This working group is bringing together coral reef paleontologists, historical ecologists, fish biologists, benthic ecologists, managers, and conservation practitioners to develop a plan for incorporating long-term ecological data into decision-making to advance the sustainable management of reef ecosystems, and focusing on Caribbean coral reefs. More info and updates: https://conservationpaleorcn.org/coral-reef-working-group/.



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-July 2022. We **warmly welcome submissions** through June 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***