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OPI

OCEANS PAST INITIATIVE

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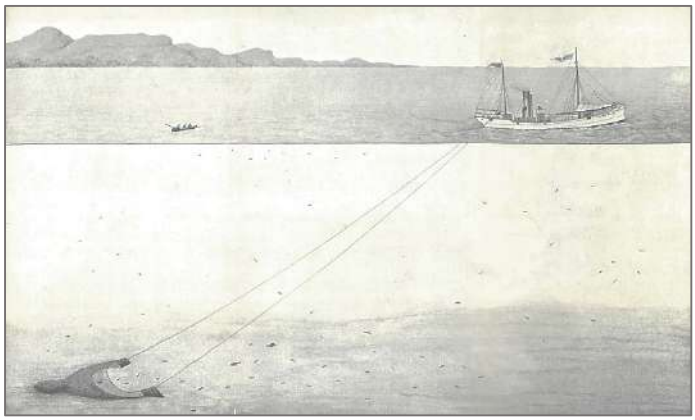
Can the past inform the present – and future?

"The Menhaden Fishery: Fishermen signalling to shore crews the approach of a school of fish" From sketch by Capt. BF Conklin, 1887, NOAA (USA) Historical Fisheries Collection.

"Surely, you're not suggesting we go back to the 1800s." It's a reply I've heard, and perhaps many of you as well; a dismissal of my research as nostalgia and of little use for the challenges we face today. Responses like this miss the point, and the light historical and long-term research can shed for contemporary science, management, and conservation. Increasingly, research is demonstrating the value in looking back – from improved stock assessment and restoration targets, to clearer insight on the change and dynamics of people and ecosystems over time and space. This edition of OPN highlights such work, all of which helps us understand where we are today, and how we can better plan for change in the future.

Even the old adage that those who ignore the past are doomed to repeat it misses a simple truth: the past has much more to offer than a reminder of previous mistakes.

***Emily S. Klein**, Southwest Fisheries Science Center & The Farallon Institute, USA*
OPN Editor



Drawing of the historical trawl vessel, SS Pieter Faure, towing its trawl gear (from Department of Agriculture. 1899. Report of the Marine Biologist for the Year 1898. Cape Town, Cape of Good Hope).

OCEANS PAST SPOTLIGHT*

Jock Currie, PhD: **Use of historical gear reveals ecosystem change in South Africa and combats shifting baselines for management and science**

Understanding the state of historical fish communities and their ecosystems is critical for the informed management of ocean spaces. Without the knowledge of historical baselines, a context to interpret current ecosystem condition and change is lacking, whether the focus is population densities, assemblage compositions, or the distribution of species. We were inspired to investigate such baselines and assess long-term change on South Africa's Agulhas Bank by the rediscovery and digitisation of historical trawl survey data from 1897-1904. Before this time, local fishing effort consisted of beach seining or line-fishing from small open boats or the shoreline, which meant that these initial trawl surveys captured a rare snapshot of temperate demersal ecosystems when they were relatively untouched by people.

The most accurate and meaningful comparison with the historical data would be to replicate historical methods and gear in a long-term repeat experiment. This would avoid grappling with substantial changes in trawl technology and their unquantified influences on catches. Therefore, we set out to perform such repeat surveys. The historical trawl gear was reconstructed through careful interpretation of relevant literature and photographs to ascertain the design, dimensions, materials, and methods of fishing. An early 'Granton otter trawl' net was built, together with flat wooden otter boards. In 2015, three sites were successfully re-surveyed with the replicated historical gear and methods,

Each issue of Oceans Past News includes a feature article to highlight research happening in our community, as either an **Oceans Past Spotlight or as **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.*

fished from a chartered side-trawler. The aim was to quantify how fish assemblages changed over a 111-year period, during which industrialised fishing and mounting anthropogenic pressures had developed.

Results showed that a suite of historically-dominant species have been mostly replaced by a different collection of taxa, signifying substantial ecosystem change. The work highlighted the extent to which certain species had declined, while other taxa had increased substantially. Habitat preferences as well as geographic and depth distribution appeared to separate the taxa that increased from those that had declined over time. These factors, together with indirect trophic impacts, reproductive and growth characteristics have likely shaped the responses of demersal fish communities to fishing and other human impacts.

Besides the provision of novel historical context for future studies and decision-making, this work helps counter the erosive nature of shifting baselines† in South Africa's marine environment. The results are being reported to government working groups that advance science-based fisheries management recommendations. In addition, the findings have bearing on ecocertification programs and conservation assessments for both species and ecosystems.

Currie, J.C., 2017. ***Historical baselines and a century of change in the demersal fish assemblages on South Africa's Agulhas Bank*** *(PhD thesis). University of Cape Town, South Africa; https://open.uct.ac.za/handle/11427/27385.*

Deck scenes of a trawl haul from the historical research vessel, the SS Pieter Faure (top), and the repeat survey led by Jock Currie, in photo, 111 years later (bottom).

REFLECTION

Long term perspectives and contemporary management challenges: Researchers around the world are currently wrestling with the next paradigm shift in fisheries management: the transition from single species to ecosystem-based mechanisms (ecosystem-based fisheries management, EBFM) for stock assessment and quota setting. As **Northeast Fisheries Science Center** (Woods Hole, MA, USA) researcher **Mike Fogarty** explained recently, such a change represents "**not a revolution, but an evolution**."

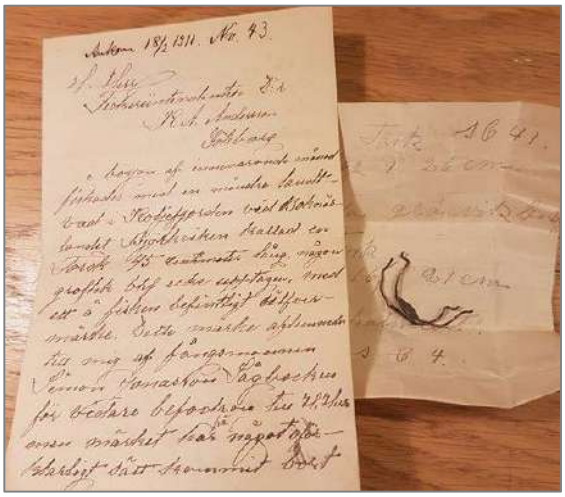
Historical marine ecology (HME) and **marine environmental history (MEH)**, for two very different reasons, can contribute greatly to this transition. From a stock assessment perspective, historians and scientists working together can provide the information by which long term biomass, fishing effort, and mortality trends can be mobilized to lengthen assessment scientists' time horizons. For long-heavily fished areas such as New England, USA, including such information is essential if we are to fully understand what the ecosystem has the potential to offer. And while past performance is no indicator of future possibilities, it seems irrational to ignore systematically collected, thoroughly vetted, and fully documented data that happened to be assembled before arbitrary historical moments.

Fogarty's identification of evolution over revolution also points to another important aspect of this task: once developed scientifically, EBFM models must be adopted by managers concerned with a variety of stakeholder interests. Scientists and historians can help here, too. By highlighting how past peoples have viewed, understood, and related to their marine ecosystems over long periods, we can better frame and understand how new policy recommendations emerging from ecosystems-based models will likely be received, interpreted, opposed, and embraced. By pushing our vision further back, we can recognize how socially and cultural rooted fisheries science and management truly are. This insight is something that HME and MEH can uniquely provide.

~ Matthew McKenzie, Associate Professor, History and Maritime Studies
University of Connecticut, USA

†Pauly, D. 1995. Anecdotes and the shifting baseline syndrome of fisheries. TREE. Available at https://www.cell.com/trends/ecology-evolution/pdf/S0169-5347(00)89171-5.pdf

RESEARCH NEWS



A letter from 1911 that a fisherman sent back along with the recapture information of a tagged cod, alongside an example of old tags employed (at right). Swedish Regional State Archives in Gothenburg, Photo: Annelie Hilvarsson.

Tagging data sheds light on Eastern Baltic cod: Effective management of exploited fish stocks requires good estimates of growth rates, which rely on a reliable and consistent age determination. The Eastern Baltic cod (*Gadus morhua*) is a key top predator in the Baltic Sea and an important source of income for the fisheries. Despite its importance, it has been increasingly difficult to estimate age, and thus quantify the growth rates, for this stock. Historical tagging surveys offer a novel avenue for understanding cod growth and providing this critical information for management. In **TABACOD** (Tagging Baltic Cod; http://www.tabacod.dtu.dk/), a project financed by **BalticSea2020**, researchers are using extensive historical external tagging data from Sweden, Germany, Poland and Denmark. These data will be used to directly estimate the growth rates of Eastern Baltic Sea cod in 1960s-1980s, providing a baseline for comparisons with recent tagging surveys. Researchers will also use historical and contemporary tagging surveys to analyse the movements of cod across the Baltic and better resolve mixing between stocks. Collectively, the biological information gained from analysing historical tagging data will help develop new analytical stock assessment models and improve the advice for Baltic cod management. Further, for a successful tagging study, a high reporting rate of the recaptured fish is necessary. The preliminary results of the project show that the reporting rate was higher in the past compared to present surveys. A possible reason for this difference may be different processing techniques: in the past fish were handled directly by the fishermen, and therefore the tags were more easily detectable, while larger fishing vessels and automatic degutting machines makes the detection of the tags more difficult. Understanding the causes of these differences between the past and present reporting rates can help improving future tagging studies, introducing for example new types of tag and on-board automatic detector.

~ Monica Mion & Michele Casini, Swedish University of Agricultural Sciences, Dept. of Aquatic Sciences.

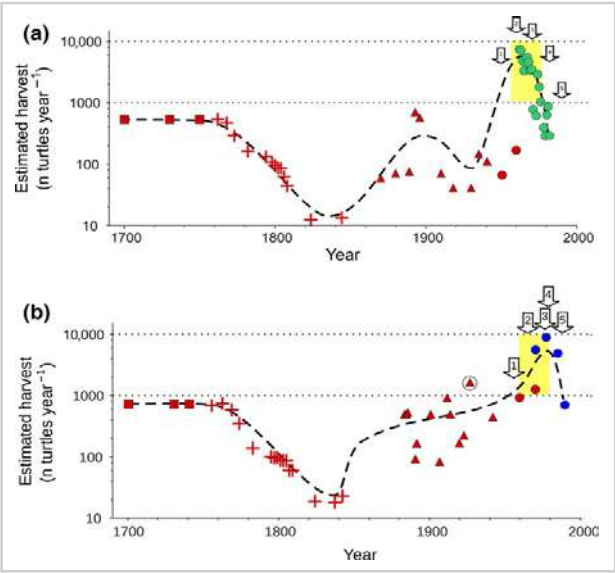


Fig 2 from Early-Capistrán et al.: Estimated annual harvest of C. mydas*, two areas in Baja California, Mexico,1700–1990.*

Researchers reconstruct baselines and human impacts on green sea turtles in Baja California, Mexico: Marine turtles were exploited for millennia in the Eastern Pacific, before systematic monitoring began. In Baja California, Mexico, sea turtles have been a staple food source for at least 12,000 years. **Michelle-María Early-Capistrán and colleagues** used ethnographic and historical data to generate a detailed reconstruction of the East Pacific green sea turtle (*Chelonia mydas*) in Mexico's Baja California peninsula for close to 300 years, from 1700 to 1990. In contrast with regions such as the Caribbean, they found small human populations and limited market access resulted in sustainable turtle harvests until the second half of the 20th century, when estimated annual catches exceeded those of the previous 250 years by an order of magnitude. This explosive increase in effort severely depleted the green turtle population and led to the collapse of the fishery. It began to recover in the early 2000s, following a total ban on sea turtle captures and other significant conservation efforts. Using this work, the authors define a reliable historical baseline abundance of sea turtles in the region, demonstrating the importance of long-term perspectives and novel data sources for contemporary management and conservation. *Related publication: Early-Capistrán, M-M, et al. (2017).* ***Reconstructing 290 years of a data-poor fishery through ethnographic and archival research: The East Pacific green turtle (Chelonia mydas) in Baja California, Mexico****.* Fish and Fisheries*. doi: 10.1111/faf.12236.*

COLLABORATIONS

Oyster men and fishing equipment, Port Lincoln, South Australia 1909. State Library of South Australia.

Historical work spurs unprecedented shellfish restoration in Australia: Restoration of lost marine habitats and productivity is gaining interest worldwide. In 2016, the South Australian Government announced a commitment to undertake the largest shellfish reef restoration project in the southern hemisphere. This project was spurred by new knowledge on the extensive loss of shellfish ecosystems, particularly those formed by the native oyster *Ostrea angasi*. Previous research by **Heidi Alleway** and **Sean Connell** used historical records of commercial oyster catches to reconstruct oyster ecosystem baselines, finding they previously occurred across more than 1,500 km of the states' coastline. Additional work, described in a paper out this year in PLoS ONE, revealed sharp declines in other shellfish ecosystems in Australia in the late 1880s and early 1900s. Collectively, research demonstrated both the degradation of Australian shellfish ecosystems, and the limitation of scientific understand that stems from the shifting baseline syndrome.

One of the custom made concrete structures for oyster reef reconstruction being lowered into place on the new reef (PIRSA)

Outcomes also show the promise of historical work for contemporary conservation and restoration. Prompted by this work, a 4 ha trial project, 150 km from the capital city, Adelaide, the first shellfish restoration reef of its kind in South Australia and the biggest project of its kind in Australia, is being constructed to enhance recreational fishing opportunities through restoring the local shellfish population and 'reef' habitat traditionally created by *O. angasi* prior to their overexploitation. Under the local Aboriginal name of the coastal region in which the reef is located, **Windara Reef** was opened to the public in August 2017, with planned expansions for 2018. Further restoration projects will soon follow in South Australia and other Australian states, including Western Australia and Victoria. The success of Windara Reef lies in the collaborative, multi-partner approach, involving all three tiers of Government, industry operators and conservation groups, as well as the proactive adoption of a policy of support for shellfish ecosystem restoration based on increasing knowledge of ocean ecosystems in the past, and what has been lost.

Related research: Alleway & Connell, 2015. ***Losing oyster reefs to history****.* EScience*, http://escience.realviewdigital.com/?iid=117938#folio=48, and Gillies et al. 2018.* ***Australian shellfish ecosystems: Past distribution, current status, and future direction****.* PLoS ONE*. doi.org/10.1371/journal.pone.0190914. More on the oyster restoration project at www.adelaide.edu.au/environment/marine-biology/research/oyster-reefs/ and on Windara at www.pir.sa.gov.au/fishing/recreational_fishing/windara_reef and www.natureaustralia.org.au/our-work/oceans/restoring-shellfish-reefs/south-australian-reef-to-revive-the-gulf/.*

Can the past inform today's blue growth agendas‡? Last year this question was posed by members of the ICES (International Council for Exploration of the Seas) **Working Group on the History of Fish and Fisheries (WGHIST)**. Although the term "blue growth" originated in the recent decade and was not a term used in the past, WGHIST members aimed to understand whether blue growth objectives have previously been attempted and or achieved. Hailing from a range of countries and focusing on capture fisheries and aquaculture, WGHIST used historical case studies to determine if goals of contemporary blue growth agendas had corollaries in the past, and therefore perhaps lessons for blue growth today. Using these case studies, from Venice to Australia, research is outlining how aspects of blue growth were attempted or implemented in the past, and following their success or failure, developing advice for future blue growth policy. The work will be submitted to peer review this year. More on WGHIST at: **http://www.ices.dk/ community/groups/Pages/WGHIST.aspx**.

‡For examples of 'blue growth' agendas, see that for the European Commission, https://ec.europa.eu/maritimeaffairs/policy/blue_growth_en, and the Food & Agricultural Organization of the United Nations (UN FAO), http://www.fao.org/zhc/detail-events/en/c/233765/

What are iconic Western Australian fisheries worth? Murdoch University has secured funding to assess the social and economic value of two iconic fisheries in Western Australia. The three-year study investigating the **blue swimmer crab** and **black bream** fisheries in the Peel-Harvey and Blackwood estuaries in the Southwest of the State will also evaluate the economic case for investing in release programs for these fisheries. The research will examine historical changes in values, perceptions, and the governance of these fisheries. It is hoped that the project's findings will help guide future investment and management of these fisheries across the state. The multidisciplinary project team is led by **James Tweedley** and includes **Neil Loneragan, Michael Hughes** and **Malcolm Tull**. Two PhD students, **Clara Obregon** and **Denis Abagna**, have been appointed to work on the social and economic values of the two fisheries. The project is supported by funding from the Fisheries Research and Development Corporation on behalf of the Australian Government, with additional financial support provided by the Western Australian Recreational Fishing Initiatives Fund. For more information: **https://jamestweedley.wixsite.com/goldenfish**.

The Goldenfish team at Murdoch University.

ICES Workshop to engage marine historical ecology and fisheries science: Stock assessment is a critical tool for fisheries management, yet many assessments only use very short and modern time series. Historical and longer-term data can improve stock assessment by providing information on baselines and how stocks change over time. The **ICES** (International Council for Exploration of the Seas) **Workshop on Integrating Historical Data into Modern Stock Assessment (WKIHSD)** aims to demonstrate these and other potential benefits of including historical data in stock assessment by directly connecting researchers with historical data to fisheries scientists. Goals of this workshop are: (1) explore and apply different methods to incorporate historical data into modern stock assessment, and (2) explore the advantages of using longer time series in stock assessment and better understand the potential of historical resources for biomass reference points. WKIHSD is chaired by **Massimiliano Cardinale** of the Swedish University of Agricultural Sciences, Institute of Marine Research, and **Giuseppe Scarcella** of the Italian National Research Council, Institute of Marine Science, and will take place in Lysekil, Sweden, 27-31 August 2018. If you want to be involved, either as a participant or to provide historical resources, please visit **http://www.ices.dk/ community/groups/Pages/WKIHSD.aspx**.

RECENT PUBLICATIONS

Bennema, FB (2018). **Long-term occurrence of Atlantic bluefin tuna *Thunnus thynnus* in the North Sea: contributions of non-fishery data to population studies**. *Fisheries Research*. 199:177-185. https://doi.org/10.1016/j.fishres.2017.11.019.

Early-Capistrán M-M, & A Sáenz-Arroyo, J-G Cardoso-Mohedano, G Garibay-Melo, SH Peckham, V Koch. (2017). **Reconstructing 290 years of a data-poor fishery through ethnographic and archival research: The East Pacific green turtle (*Chelonia mydas*) in Baja California, Mexico**. *Fish and Fisheries*. doi: 10.1111/faf.12236.

Eckert LE, & NC Ban, A Frid , M McGreer (2018). **Diving back in time: Extending historical baselines for yelloweye rockfish with Indigenous knowledge.** *Aquatic Conservation*. 28(1):158-166. https://doi.org/10.1002/aqc.2834.

Eddy TD, & WWL Cheung, JF Bruno (2018). **Historical baselines of coral cover on tropical reefs as estimated by expert opinion**. *PeerJ* 6:e4308. https://doi.org/10.7717/peerj.4308.

Gilad E, & SM Kidwell, Y Benayahu, Y Edelman-Furstenberg (2018). **Unrecognized loss of seagrass communities based on molluscan death assemblages: historic baseline shift in tropical Gulf of Aqaba, Red Sea**. *Marine Ecology Progress Series* 589: 73-83. https://doi.org/10.3354/meps12492.

Gillies, CL & IM McLeod, HK Alleway, P Cook, et al. (2018). **Australian shellfish ecosystems: Past distribution, current status, and future direction**. *PLoS ONE* 13(2): e0190914. https://doi.org/10.1371/journal.pone.0190914.

Horbowy J & MT Tomczak (2017). **Extension of biomass estimates to pre-assessment periods using density dependent surplus production approach**. PLoS ONE. 12(11). e0186830. doi.org/10.1371/journal.pone.0186830.

Hutchings P, & E Kupriyanova (2018). **Cosmopolitan polychaetes – fact or fiction? Personal and historical perspectives.** *Invertebrate Systematics*. 32(1): 1-9. https://doi.org/10.1071/IS17035.

MacKenzie, BR & H Ojaveer (2018). **Evidence from the past: exploitation as cause of commercial extinction of autumn-spawning herring in the Gulf of Riga, Baltic Sea**. *ICES Journal of Marine Science*, doi:10.1093/icesjms/fsy028.

Pooley, S (2018). **Descent with modification: Critical use of historical evidence for conservation**. *Conservation Letters*. E12437: https://doi.org/10.1111/conl.12437.

Rodrigues, AT, & I McKechnie, DY Yang (2018). **Ancient DNA analysis of Indigenous rockfish use on the Pacific Coast: Implications for marine conservation areas and fisheries management**. *PLoS ONE*. 13(2): e0192716. https://doi.org/10.1371/journal.pone.0192716.

ANNOUNCEMENTS: PhD OPPORTUNITY

Call for a PhD student to study trajectories of change in marine megafauna for using diverse archival resources alongside novel statistical techniques for sparse or sporadic data. The research aims to merge interdisciplinary methods, increase our understanding of the risks posed to large iconic species, and aid marine managers in setting more accurate targets for their recovery. This project also offers have the opportunity to conduct research in both Australia and the UK, leveraging resources in both and allowing comparisons for a global focus. The deadline for expressions of interest is 26 May 2018. Project description and to apply: https://global-engagement.uq.edu.au/node/1616/2#2; contact **Ruth Thurstan** (r.thurstan@exeter.ac.uk) or **John Pandolfi** (j.pandolfi@uq.edu.au) with questions.

ANNOUNCEMENTS: CONFERENCES

Oceans Past VII (OPVII), "**Tracing human interactions with marine ecosystems through deep time: implications for policy and management**" is issuing a second call for abstract for late breaking research that will advance conference themes. This call opened 24 April and will close on 15 May, and will be the final call for abstracts for this conference. Abstracts of late-breaking research should be submitted to infor@oceanspast.org. For more and to submit, please visit *https://bit.ly/2JxeweH* or *http://oceanspast.org/oceanspastvii.html*.

The **1st CONCHA Workshop, "Crossing Seas, Rising Islands, Connecting People** will be held in Lisbon, 14-16 November 2018. A central discussion of the meeting will be on understanding how early settlements in the Atlantic Islands (15th to 17th Ce) developed in relation to differing regional and local ecological and economic environments. Deadline for abstracts is April 30 (send to concha.meetings@gmail.com). More at: *http://www.cham.fcsh.unl.pt/ac_actividade.aspx?ActId=696* and *https://www.facebook.com/events/15846206316 13858/*.

The **53rd European Marine Biology Symposium (EMBS53)** aims to "link the history, the present, and the future of (European) marine biology", and one of the four conference themes is **Science from a historical perspective**. Organized by the Flanders Marine Institute (VLIZ) and Lifewatch Belgium, EMBS53 will take place 17-21 September 2018 in Ostend, Belgium. *http://www.embs53.org/*.

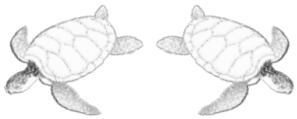
International Conferences on Environmental Humanities, "Stories, Myths, and Arts to Envision a Change." Alcalá de Henares, Spain, July 3-6, 2018. More at *http://www.institutofranklin.net/en/events/international-conference-on-environmental- humanities/*.

The Centre for Research in Political Science (CICP) and the Interdisciplinary Center for History, Culture and Societies (CIDEHUS) of the University of Évora are pleased to be hosting the **III Meeting of the Portuguese Network of Environmental History, "Dynamics and Resilience in Socio-Environmental Systems"**, to be held in Évora, Portugal, between 28 and 30 March 2019. More information at *https://encontroreportha2019.weebly.com/*.

The **3rd World Congress of Environmental History, "Convergences: The Global South and the Global North in the Era of Great Acceleration"**, will take place from 22 – 26 July, 2019, in Florianopolis, Brazil, at the Universidade Federal de Santa Catarina. The call for papers is open, and the deadline for submission is 10 September 2018. More information and to submit on the webpage, *http://www.3wceh2019.floripa.br/*.

ANNOUNCEMENTS: CALL FOR BOOK PROPOSALS

Interdisciplinary in its approach, **Maritime Humanities, 1400–1800: Cultures of the Sea** puts maritime humanities at the centre of a transnational historiographical scholarship that seeks to transform traditional land-based histories of states and nations by focusing on the cultural meanings of the early modern ocean. The series welcomes books from across the full range of humanities subjects, and invites submissions that conceptually engage with issues of globalization, post-colonialism, eco-criticism, environmentalism, and the histories of science and technology. For more information, visit: **https://bit.ly/2JuWgCN**.



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 our editors, **Emily Klein** (emily.klein04@gmail.com) or **Cristina Brito** (escolademar@gmail.com).

*The next Oceans Past News will be out mid-July 2018. We **warmly welcome submissions** through June, 2018.*

RESOURCES

The Oceans Past News Archive is available online: **http://oceanspast.org/newsletter.html**
More on the Oceans Past Initiative: **http://oceanspast.org/index.html**
We are also on Facebook: **https://www.facebook.com/groups/122288493384/**