Annotated Bibliography

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- Green crab establishment and movement, an example of costly economic impacts from marine invasive species.

Bennun, L., Van Bochove, J., Ng, C., Fletcher, C., Wilson, D., Phair, N., & Carbone, G. (2021). Mitigating biodiversity impacts associated with solar and wind energy development: Guidelines for project developers. *IUCN, International Union for Conservation of Nature*. https://doi.org/10.2305/IUCN.CH.2021.04.en

- Summary of 65 studies looking into the effects of OWF on biotic communities, compiled by the IUCN.

BOEM Oregon Joint Effort. (2021). *Oregon Offshore Renewable Energy: BOEM-Oregon Offshore Wind Planning Efforts* [Fact Sheet]. Bureau of Ocean Energy Management. https://www.boem.gov/sites/default/files/documents/regions/pacific-ocs-region/renewable-energy/BOEM-Oregon-Joint-Effort-Fact-Sheet_0.pdf

Broad A., Rees M. J., & Davis A. R. (2020). Anchor and chain scour as disturbance agents in benthic environments: trends in the literature and charting a course to more sustainable boating and shipping, *Marine Pollution Bulletin*, Volume 161, Part A, 111683, ISSN 0025-326X, https://doi.org/10.1016/j.marpolbul.2020.111683.

- Anchor scouring and disturbance

Broehl, J., & Gauntlett, D. (2018) North American Wind Energy Copper Content Analysis *Copper Development Association* https://www.copper.org/publications/pub_list/pdf/a6198-na-wind-energy-analysis.pdf

Brooks, A. (2022). *Renewable Energy Resource Assessment Information for the United States* (EXEC-2020-003533, 1855910, 8837; p. EXEC-2020-003533, 1855910, 8837). https://doi.org/10.2172/1855910

- An overview of different renewable energy resources focused on the United States. Good background on offshore wind and use nationally.

Call for Information and Nominations-Commercial Leasing for Wind Energy Development on the Outer Continental Shelf (OCS) Offshore Oregon. (2022, April 29). Federal Register. https://www.federalregister.gov/documents/2022/04/29/2022-09000/call-for-information-and-nominations-commercial-leasing-for-wind-energy-development-on-the-outer

- Public notice calling for information or nominations for specific sites within the two designated Call Areas. This includes information from potentially affected parties.

Chen, Mu-Hong & Zhang, Qiang & Zhang, Lanlan & Zarikian, Carlos & Wang, Ru-Jian. (2014). Stratigraphic distribution of the radiolarian Spongodiscus biconcavus Haeckel at IODP Site U1340 in the Bering Sea and its paleoceanographic significance. Palaeoworld. 23. 90-104. 10.1016/j.palwor.2013.11.001.

- Global currents map

Daewel, U., et al. “Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea.” *Communications Earth & Environment*, vol. 3, no. 1, 2022, https://doi.org/10.1038/s43247-022-00625-0.

- Evidence that ongoing offshore wind farm developments can have a substantial impact on the structuring of coastal marine ecosystems on basin scales.

Data Gathering and Engagement Summary Report. (2022, January) BOEM Oregon Offshore Wind Planning Efforts. https://www.boem.gov/sites/default/files/documents//Data%20Gathering%20and%20Engagement%20Report%20OR%20OSW%20Energy%20Planning%20January%202022.pdf

- Summary of planning process for BOEM

Diez-Caballero, K., Troiteiro, S., García-Alba, J., Vidal, J. R., González, M., Ametller, S., & Juan, R. (2022). Environmental Compatibility of the Parc Tramuntana Offshore Wind Project in Relation to Marine Ecosystems. *Journal of Marine Science and Engineering*, 10(7), 898-. https://doi.org/10.3390/jmse10070898

- An analysis of floating offshore wind turbines in Catalonia, Spain. Goes over the motivation for implementing offshore wind turbines, impact of construction, potential vectors for marine bioinvasions, and increase in water turbidity.

Dorrell, R., Lloyd, C., Lincoln, B., Rippeth, T., Taylor, J., Caulfield, C., Sharples, J., Polton, J., Scannell, B., Greaves, D., Hall, R., Simpson, J. (2022) Anthropogenic Mixing in Seasonally Stratified Shelf Seas by Offshore Wind Farm Infrastructure. *Physical Oceanography.* Vol. 9. https://doi.org/10.3389/fmars.2022.830927

- How the turbines will contribute to mixing the water column in stratified waters. Little studies done on the scale necessary to really understand it. Studies done so far suggest that floating will do more mixing than fixed and that effects will result in more nutrient mixing and a less stable thermocline.

Fawthrop, A. (2021, March 3). Hywind Scotland is ‘proving potential’ of floating offshore wind. *NS Energy Business*. Retrieved 2023, from https://www.nsenergybusiness.com/news/company-news/floating-wind-potential-hywind-scotland/.

Floating Offshore Wind Turbine—An overview | *ScienceDirect Topics*. (n.d.). Retrieved November 24, 2023, from https://www-sciencedirect-com.proxy.lib.pdx.edu/topics/engineering/floating-offshore-wind-turbine

Floating Offshore Wind - Oregon.Gov, www.oregon.gov/energy/Data-and-Reports/Documents/2022-DRAFT-FOSW-Lit-Review.pdf. Accessed 30 Nov. 2023.

“Group of EU Countries Agree on Boost to Offshore Wind Power Capacity.” *Reuters*,

Thomson Reuters, 30 Aug. 2022, www.reuters.com/business/energy/group-eu-countries-agree-boost-offshore-wind-power-capacity-2022-08-30/.

Hansen, G. I., Hanyuda, T., & Kawai, H. (2018). Invasion threat of benthic marine algae arriving on Japanese tsunami marine debris in Oregon and Washington, USA. *Phycologia,* 57(6), 641-658. https://doi.org/10.2216/18-58.1

- Invasive species carried to US west coast after a tsunami in Japan.

HB3375 2021 Regular Session—Oregon Legislative Information System. (n.d.). Retrieved November 24, 2023, from https://olis.oregonlegislature.gov/liz/2021R1/Measures/Overview/HB3375

- HB3375 Oregon State legislature for establishing a plan to develop up to 3 gigawatts of floating offshore wind

Jiang, Z. (2021). Installation of offshore wind turbines: A technical review. *Renewable and Sustainable Energy Reviews*, *139*, 110576. https://doi.org/10.1016/j.rser.2020.110576

- In depth installation process for offshore wind turbines. Concludes that bottom-fixed offshore wind turbine methods have been standardized and are advanced but there is still room for working on floating turbine installation methods. With less security in the floating methods, it could lead to more maintenance.

Kölzsch, A., & Blasius, B. (2011). Indications of marine bioinvasion from network theory: An analysis of the global cargo ship network.*The European Physical Journal. B, Condensed Matter Physics,* 84(4), 601–612. https://doi.org/10.1140/epjb/e2011-20228-5

Langhamer, O. (2012). Artificial Reef effect in relation to offshore renewable energy conversion: State of the art. *The Scientific World Journal,* 2012, 1–8. https://doi.org/10.1100/2012/386713

- Effects of the artificial reef created by fixed OWF substrate and of creating no trawling zones (NTZ).

Leignel, V., Stillman, J. H., Baringou, S., Thabet, R., & Metais, I. (2014). Overview on the European green crab Carcinus spp. (Portunidae, Decapoda), one of the most famous marine invaders and ecotoxicological models. *Environmental Science and Pollution Research,* 21(15), 9129–9144. https://doi.org/10.1007/s11356-014-2979-4

- Economic facts on toll of green crabs

Lerch, M., De-Prada-Gil, M., & Molins, C. (2021). A metaheuristic optimization model for the inter-array layout planning of floating offshore wind farms. *International Journal of Electrical Power & Energy Systems*, *131*, 107128. https://doi.org/10.1016/j.ijepes.2021.107128

Li, C., Coolen, J. W. P., Scherer, L., Mogollón, J. M., Braeckman, U., Vanaverbeke, J., Tukker, A., & Steubing, B. (2023). Offshore Wind Energy and Marine Biodiversity in the North Sea: Life Cycle Impact Assessment for Benthic Communities. *Environmental Science & Technology*, 57(16), 6455–6464. https://doi.org/10.1021/acs.est.2c07797

- Study on effect of building OSW turbines on biodiversity over time in the North Sea - which hosts 2/3 of OSW global energy. They found that construction reduced biodiversity, but over time species richness recovered

Lord, J., & Whitlatch, R. (2015). Predicting competitive shifts and responses to climate change based on latitudinal distributions of species assemblages. *Ecology (Durham)*, 96(5), 1264–1274. https://doi.org/10.1890/14-0403.1

MacDonald, M. (2022). Coos Bay Offshore Wind Port Infrastructure Study. *TotalEnergies SBE US* https://drive.google.com/drive/u/0/folders/1v12fnOofK13AkpXqcylcEAqSCdm4JOpi

Martin, G. R., & Banks, A. N. (2023). Marine birds: Vision-based wind turbine collision mitigation. *Global Ecology and Conservation*, 42, e02386. https://doi.org/10.1016/j.gecco.2023.e02386

- Regarding impacts of OSW on marine birds, this article proposes painting the wind turbines to reduce crashes and deaths. Painting would make the wind turbines more visible from land.

Middel, H., & Verones, F. (2017). Making Marine Noise Pollution Impacts Heard: The Case of Cetaceans in the North Sea within Life Cycle Impact Assessment. *Sustainability*, 9(7), 1138. https://doi.org/10.3390/su9071138

Musial, W., Spitsen, P., Beiter, P., Duffy, P., Marquis, M., Cooperman, A., Hammond, R., & Shields, M. (2021). *Offshore Wind Market Report: 2021 Edition*.

Musial, Walter, et al. *Offshore Wind Market Report: 2022 Edition*. Aug. 2022.

"Offshore Wind Farms Make Artificial Reefs for Marine Life." *World Economic Forum*, www.weforum.org/agenda/2021/11/offshore-wind-farms-boost-ocean-biodiversity/. Accessed 29 Nov. 2023.

Oregon Activities | Bureau of Ocean Energy Management. (n.d.). Retrieved November 24, 2023, from https://www.boem.gov/renewable-energy/state-activities/Oregon

- Gives an overview of the scoping process BOEM and the DLCD are undertaking in order to identify areas that are optimal for offshore wind leasing

Oregon Offshore Renewable Energy. (2021, October) BOEM Oregon Offshore Wind Planning Efforts. https://www.boem.gov/sites/default/files/documents/regions/pacific-ocs-region/renewable-energy/BOEM-Oregon-Joint-Effort-Fact-Sheet_0.pdf

- General overview of the planning process for BOEM

Pinochet, J., Urbina, M. A., & Lagos, M. E. (2020). Marine invertebrate larvae love plastics: Habitat selection and settlement on artificial substrates. *Environmental Pollution*, 257, 113571-. https://doi.org/10.1016/j.envpol.2019.113571

Qing Y., Liu K., Teixeira A.P., & Guedes Soares, C. "Assessment of the influence of offshore wind farms on ship traffic flow based on AIS Data." *Journal of Navigation*, vol. 73, no. 1, 2019, pp. 131–148, https://doi.org/10.1017/s0373463319000444.

- Shows how OSW altera shipping routes and other ecosystem services such as fishing

Renewable Power Generation Costs in 2020. (2021, June 22). https://www.irena.org/publications/2021/Jun/Renewable-Power-Costs-in-2020

Seebens, H., Gastner, M. T., Blasius, B., & Franck Courchamp. (2013). Risk of marine bioinvasion caused by global shipping. *Ecology Letters*, 16(6), 782–790. https://doi.org/10.1111/ele.12111

- The largest risk of bioinvasion to the PNW via shipping comes from the NWP (Japan, Korea, China). Winter is the season with the highest risk. Intermediate Distance Hypothesis confirmed: Transportation along links of intermediate distance ensures both a high chance for the introduction of non-native species and their survival during transportation. 7.5k-10k km. PNW to NWP is ~9k km. The majority of ports are unlikely to receive new primary introductions via ballast water and moderate efforts at treatment of ballast water at each port substantially reduces invasion risk.

Shelef, Oren, et al. "The value of native plants and local production in an era of Global Agriculture." *Frontiers in Plant Science*, vol. 8, 2017, https://doi.org/10.3389/fpls.2017.02069.

State of Oregon: Energy in Oregon—Floating Offshore Wind Study: Benefits & Challenges for Oregon. (n.d.). Retrieved November 24, 2023, from https://www.oregon.gov/energy/energy-oregon/Pages/fosw.aspx

- Oregon Department of Energy informational page including a literature review and stakeholder consultation for developing floating offshore wind by 2030. Public comment letters are included.

Supply Chain Road Map for Offshore Wind Energy in the United States. (n.d.). Retrieved November 24, 2023, from https://www.nrel.gov/wind/offshore-supply-chain-road-map.html

Thatcher, H., Stamp, T., Wilcockson, D., & Moore, P. J. (2023). Residency and habitat use of European lobster (Homarus gammarus) within an offshore wind farm. *ICES Journal of Marine Science*, 80(5), 1410–1421. https://doi.org/10.1093/icesjms/fsad067

- This study looked at the presence of European lobsters within an offshore wind (bottom-fixed) farm and found that it provided valuable habitat for the species. In this case, OSW farms could be valuable for this species.

US EPA, O. (2020, August 28). *Renewable Electricity Production Tax Credit Information* [Collections and Lists]. https://www.epa.gov/lmop/renewable-electricity-production-tax-credit-information

Wind Energy Factsheet. (n.d.). Center for Sustainable Systems. Retrieved November 24, 2023, from https://css.umich.edu/publications/factsheets/energy/wind-energy-factsheet

WINDExchange: Production Tax Credit and Investment Tax Credit for Wind Energy. (n.d.). Retrieved November 24, 2023, from https://windexchange.energy.gov/projects/tax-credits

Zupan, M., Rumes, B., Vanaverbeke, J., Degraer, S., & Kerckhof, F. (2023). Long-Term Succession on Offshore Wind Farms and the Role of Species Interactions. *Diversity (Basel)*, 15(2), 288–. https://doi.org/10.3390/d15020288

- No stable-state for OSW communities, leaving further invasions a constant possibility. Nearly impossible to predict what species will colonize new OSW substrate habitat (need to read more on this).