URL: [Spatial planning offshore wind energy farms in California for mediating fisheries and wildlife conservation impacts - ScienceDirect](https://www.sciencedirect.com/science/article/pii/S2211464524000435)

Overviews

[Marine Spacial Planning](https://www.sciencedirect.com/topics/earth-and-planetary-sciences/marine-spatial-planning)

Bibliography

[Where to put things? Spatial land management to sustain biodiversity and economic returns - ScienceDirect](https://www.sciencedirect.com/science/article/abs/pii/S0006320708001213) An original paper about how to figure out the spatial allocation problem.

[Ecosystem service tradeoff analysis reveals the value of marine spatial planning for multiple ocean uses | PNAS](https://www.pnas.org/doi/abs/10.1073/pnas.1114215109) An original paper about how to do this in the ocean, by Crow.

[Spatial planning offshore wind energy farms in California for mediating fisheries and wildlife conservation impacts - ScienceDirect](https://www.sciencedirect.com/science/article/pii/S2211464524000435#bib65): A paper discussing fishery and wildlife conservation impacts by Crow.

[Reviewing the ecological impacts of offshore wind farms | npj Ocean Sustainability](https://www.nature.com/articles/s44183-022-00003-5)

[High resolution assessment of commercial fisheries activity along the US West Coast using Vessel Monitoring System data with a case study using California groundfish fisheries | PLOS One](https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0298868)

[Habitat-based density estimates for cetaceans in the California Current Ecosystem based on 1991-2018 survey data](https://repository.library.noaa.gov/view/noaa/27826)

[Lester: Evaluating tradeoffs among ecosystem services... - Google Scholar](https://scholar.google.com/scholar_lookup?title=Evaluating%20tradeoffs%20among%20ecosystem%20services%20to%20inform%20marine%20spatial%20planning&publication_year=2013&author=S.E.%20Lester&author=C.%20Costello&author=B.S.%20Halpern&author=S.D.%20Gaines&author=C.%20White&author=J.A.%20Barth)

[Upstream solutions to coral reef conservation: The payoffs of smart and cooperative decision-making - ScienceDirect](https://www.sciencedirect.com/science/article/pii/S030147971631060X)

Summary

Crow White is a former colleague of James who has done a lot of work in the area of our paper. We should learn more about their work.

Overall, this paper is a model for how we might want to write our paper.

Their method was to develop spatial data “layers” estimating (for a set of deployed wind turbines) the power production and the negative impacts on fisheries and marine wildlife conservation. After quantifying the response of fishers and marine wildlife to deployment of turbines, they looked at three leases to do analysis over them. They integrated the sector response data into their framework, which lets them find solutions to the problem, how can we deploy wind turbines in ways that maximizes electricity production constrained by minimizing impact on fisheries and wildlife? They compared the impact of three leases they looked at to the factors they considered. They found that minimal changes to the granted leases could have mitigated most of the impacts on fisheries and/or wildlife while only marginally impacting power generation.

The paper mentions a lot of factors: marine sanctuaries?, onshore power transmission infrastructure?, federal/state ownership of the ocean space?, strength of winds. There’s a history of decisions around wind farms in California. A summary of the fisheries in California. A summary of impacts of floating wind turbine farms on whales. A summary of impacts of turbines on bird populations. It has a lot of callouts to papers talking about the California situation, which are not that useful to us. What is useful is, this is a model paper for our analysis.

They conclude that spatial planning research estimates that wind energy facilities can be sited in the ocean and be compatible with other ocean activities and ecosystem service objectives, within certain constraints. When sited strategically and limited in its total footprint, a wind facility can generate minimal impacts to fisheries and marine conservation ([White et al., 2012](https://www.sciencedirect.com/science/article/pii/S2211464524000435" \l "bib107)). This paper is a specific application….

Methods

They gridded the area they were studying into many 2x2km patches (which is the size needed to support an offshore floating wind turbine). Two options were considered: no change and full change.

The paper talks about how to measure energy consumption. They “siumulated” wind speed (a thing we can steal!). They talk about how hard it is to measure energy creation. There’s a paper in the bibliography about that

It talks about how to measure fisheries data. I added a paper about that.

It talks about how to measure seabird data. I added a paper about that.

It talks about measuring cetacean data. I added a paper about that.

It talks about methodologies for trading off impacts of a wind turbine decision on all these things. I added a paper about that.

The “tradeoff analysis” section is important for our paper. The Lester paper is the foundation here. This paper has their many technical advances since the ten-year-old paper.

The “upstream solutions” paper talks about the computation strategies this paper used. This paper goes on to tell a detailed story. We need to understand this, as it’s a suggestion for how our code should work.

They found that if you were careful, you could distinguish between potential locations in terms of anticipated wind power and impact on wildlife. The majority of the “meat” of the paper talks about this.

Discussion:

This paper goes past the analysis of large lease areas into the analysis of specific decisions within our lease areas. They also have a simple data model we could use to bring data from Oregon into their framework and add analysis about where to put wind farms here. We could provide the beginning of an analytic framework.