Valuing offshore wind in New England and New York
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Introduction
In New England, there is an abundance of potential for offshore wind development due to both shallow waters, and existing governmental interest.

30 MW were installed off Block Island, RI. MA has committed to 1,600 MW by 2027. The Bureau of Ocean Energy Management has leased this water for offshore wind [1], The objective of the research being done is to determine the environmental value of offshore wind in New England and New York, and where it can be implemented.

Modeling and Calculations
We define the value of offshore wind as the change in the total cost of climate damages and cost of abatement when offshore wind is added to the portfolio. Value of OWE = (\text{D}_{\text{GCAM}} - \text{D}_{\text{OW}}) * (\text{GDP}_{\text{state}} - \text{GDP}_{\text{global}})

To extract the change in mean global temperature and the cost of regional abatement in response to the implementation of offshore wind, the Global Change Assessment Model (GCAM) was used.

Results

**The value of offshore wind in New England and New York**

Figure 4. The value of offshore wind in each state. HC and LCAT refer to the lowest and highest cost cases for offshore wind. The two bars above each of these are for damages allocated by GDP and the damages allocated by population.

**The value of offshore wind in New England and New York per capita**

Figure 5. The value of offshore wind per thousand people in each state.

Maps:
To get a better sense of how much offshore wind was modeled in New England, the offshore wind GCAM outputs were mapped. The locations are dependent on wind speed, distance from shore, and water depth.

**Maps:**
- Figure 6. Map of offshore wind with business as usual policy
- Figure 7. Map of offshore wind with business as usual policy
- Figure 8. Map of offshore wind with $10 carbon tax high cost case
- Figure 9. Map of offshore wind with $10 carbon tax low cost, advanced technology case

Conclusions
- GCAM distributed more wind to areas close to shore that are not necessarily realistic.
- When downscaling damages, if GDP was used, there was a dip between the $10 tax case and the Representative Concentration Pathways 4.5 case (scenario that achieves a radiative forcing value of 4.5 W/m\(^2\) by 2100 [5]), while if population was used, there was an increase. Damages were also larger overall when GDP was used, which can be accounted for in that New England and New York GDP's took up a larger percentage of the global GDP than New England and New York's population took up globally.

Future Work
- Update GCAM to remove infeasible areas of wind energy development. Estimate the value of offshore wind with these assumptions.
- After removing infeasible areas, work on creating realistic offshore wind development scenarios for each state.

References

Acknowledgments
This work is partially supported by the NSF-sponsored IGERT: Offshore Wind Energy Engineering, Environmental Science, and Policy (Grant Number 1068864) and NSF award number 1540462.

Any opinions, findings, conclusions, or recommendations expressed in this material are those of the authors and do not necessarily reflect those of the National Science Foundation.