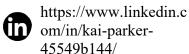
Kai Parker

PhD, Coastal Scientist





Santa Cruz, CA





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Summary

Innovative coastal scientist with over a decade of experience in coastal hazard modeling, climate adaptation, and stakeholder-driven science across the U.S. West Coast. Proven leader in developing and managing multi-million-dollar projects at the USGS, with a strong foundation in numerical modeling, geospatial analysis, and nature-based solutions. Adept at translating complex data into actionable insights for diverse audiences, from policymakers to local communities. Passionate about mentoring, cross-disciplinary collaboration, and advancing coastal resilience through science-based planning and communication.

Work Experience

United States Geological Survey – Physical Scientist

(2024 – Present)

- Technical lead for CoSMoS modelling in the Salish Sea, delivering actionable coastal hazard data impacting populations in the millions.
- Managed team and budget (external funding totaling >4 million) with demonstrated success at product delivery and generation of new partners/projects.
- Lead collaboration with multiple partners and sustained engagement with diverse stakeholders including tribes, counties, communities, and federal and academic partners.
- Mentorship of junior staff and postdoctoral researchers, building internal capacity.

United States Geological Survey - Oceanographer

(2020 - 2024)

- Designed coastal modelling workflows allowing a small team to develop multi-hazard datasets at regional scales (entire Southeast Atlantic).
- Developed data pipelines to efficiently process 30+ TB of data into stakeholder-ready products
- Work on adaptation solutions to address ecosystem degradation and coastal hazard risk.

Fulbright Scholar (Chile)

(2019)

- Application of machine learning techniques for long-term wave and shoreline change hindcasting in resource poor (computational and data) environments.
- Contributed to adaptation planning efforts for a critical Chilean coastal site (Pichilemu).

Graduate Research Assistant (Oregon State University)

(2014 - 2018)

Grays Harbor Coastal Futures

- User-centered design, bridging research to stakeholders for community adaptation to risk.
- Design of multiple adaptation scenarios, including various nature-based solutions.
- Large interdisciplinary team including public policy, economics, ecology, and more.

An Emulation Based Approach to Estuarine Flooding

- Developed new hybrid machine learning/physical modeling methodology for robust probabilistic coastal hazard assessments.
- Applied Monte Carlo simulations and non-stationary extreme value analysis to quantify probabilistic hazards, enabling data-driven decision-making under future climate scenarios.

Moffatt & Nichol, San Diego Office – Coastal Engineering Internship (2012 - 2013)

- Comprehensive analysis of various coastal phenomenon such as shoreline erosion, sediment budgets, river/estuary modeling, sea level rise, etc.
- Extensive technical writing explaining coastal processes at multiple audience levels.

Skills

- **Programming Languages**: Python, Matlab, R, Git, bash, Fortran.
- Physical Modelling: Delft3d, Adcirc, SFINCS, Xbeach, SWAN, and many others.
- Geospatial: ArcGIS Pro, Qgis, GDAL, Python geospatial (geopandas, rasterio, etc.)
- Engineering (general): Engineer-in-Training (State of California), CAD.
- HPC: SLURM, MPI enabled workflows, linux, Deep-learning,
- **Data Science / ML:** Big data (>30 TB) workflows, Neural networks, ensemble techniques and Monte Carlo Simulations, regression analysis, Bayesian analysis.
- **Communication:** Technical writing, public presentations, stakeholder facilitation.
- **Fieldwork certifications:** Wilderness First Responder, CPR, SCUBA Open Water, Motorboat (MOCC), Jetski, and ATV operator.

Education

Doctor of Philosophy, Coastal and Ocean Engineering

(2013 - 2018)

Oregon State University: Corvallis, Oregon Minor in Statistics

Bachelor of Science, Civil Engineering

(2007 - 2012)

California Polytechnic State University: San Luis Obispo, California

Recent Journal Publications (since 2024)

- Barnard, P. L., Befus, K. M., Danielson, J. J., Engelstad, A. C., Erikson, L. H., Foxgrover, A. C., Hayden, M. K., Hoover, D. J., Leijnse, T. W. B., Massey, C., McCall, R., Nadal-Caraballo, N. C., Nederhoff, K., O'Neill, A. C., **Parker, K. A.,** Shirzaei, M., Ohenhen, L. O., Swarzenski, P. W., Thomas, J. A., ... Jones, J. L. (2025). Projections of multiple climate-related coastal hazards for the US Southeast Atlantic. Nature Climate Change. https://doi.org/10.1038/s41558-024-02180-2
- Stevens, A. W., Ruggiero, P., **Parker, K. A.**, Vitousek, S., Gelfenbaum, G., & Kaminsky, G. M. (2024). Climate controls on longshore sediment transport and coastal morphology adjacent to engineered inlets. Coastal Engineering, 194. https://doi.org/10.1016/j.coastaleng.2024.104617
- Vitousek, S., Vos, K., Splinter, K. D., **Parker, K.,** O'Neill, A., Foxgrover, A. C., Hayden, M. K., Thomas, J. A., Erikson, L., & Barnard, P. L. (2024). Scalable, data-assimilated models predict large-scale shoreline response to waves and sea-level rise. Scientific Reports, 14(1). https://doi.org/10.1038/s41598-024-77030-4
- Thomas, J. A., Barnard, P. L., Vitousek, S., Erikson, L. H., **Parker, K.**, Nederhoff, K., Befus, K. M., & Shirzaei, M. (2024). The projected exposure and response of a natural barrier island system to climate-driven coastal hazards. Scientific Reports, 14(1), 25814. https://doi.org/10.1038/s41598-024-76749-4