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(Online)

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Supporting collaborative engagement for water quality management in the Salish Sea with a web-based visual analytic tool, DORA (Dissolved Oxygen Regional Assessment explorer)

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Supporting collaborative engagement for protecting Salish Sea with web-based visual analytic tool, DORA (Dissolved Oxygen Regional Assessment explorer).

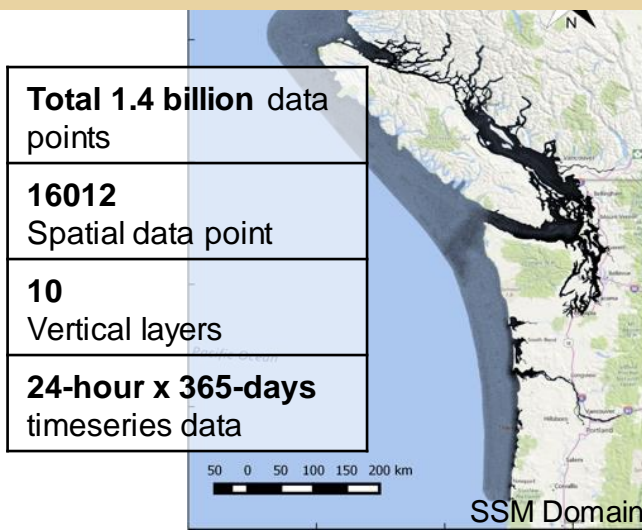


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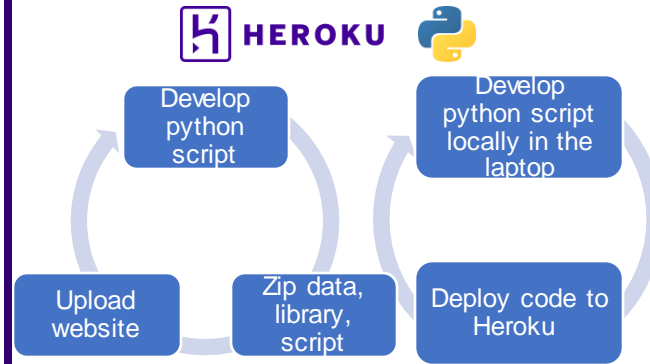
Abstract

Water quality issues of the Salish Sea system are complexly intertwined, with multiple stakeholders and an extensive management community. Both researchers and regulators have focused on better understanding the impact of human activity on the water quality of the Salish Sea. The modeling efforts primarily focused on the human activity impact on dissolved oxygen based on different nutrient loading scenarios for the Salish Sea. However, to improve the public access and understanding of scenario impacts across various water quality parameters such as dissolved oxygen, nitrogen, and net primary production both spatially and temporally, we designed a low-cost prototype of a web-based visual analytic tool, DORA (Dissolved Oxygen Regional Assessment explorer). DORA was developed by using the open-source language, Python, and the cloud platform, Heroku. DORA would encourage wider stakeholders to access scenario outputs, from students and concerned citizens to managers who want to explore underlying mechanistic processes in the complex decision-making of water quality management.

Introduction

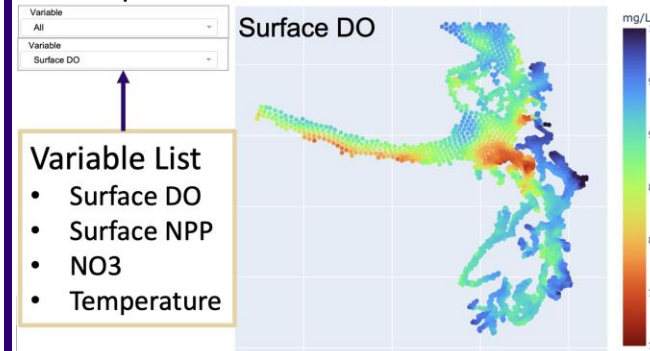


Method



Result

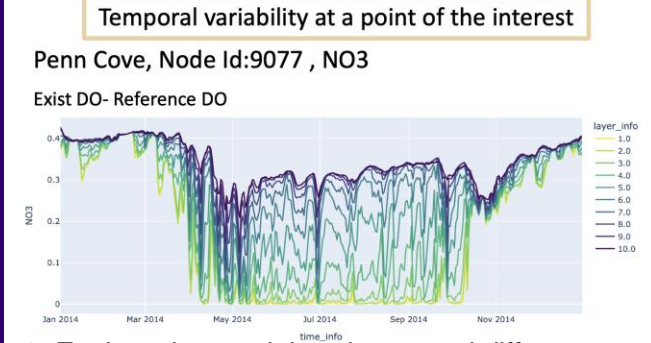
1. Explore the spatial variability of the model parameters



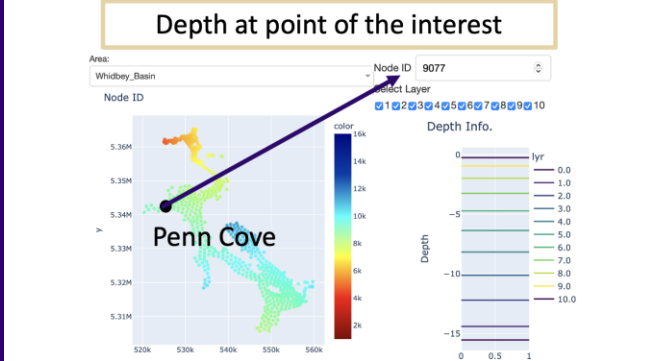
Reference

[1] Ahmed, A., et al. "Puget Sound Nutrient Source Reduction Project, Volume 1: Model Updates and Bounding Scenarios." *Washington Department of Ecology, Publication* (2019): 19-03.
 [2] Khangaonkar T, A Nugraha, W Xu, W Long, L Bianucci, A Ahmed, T Mohamedali, and G Pelletier. 2018. Analysis of Hypoxia and Sensitivity to Nutrient Pollution in Salish Sea. *Journal of Geophysical Research— Oceans*, 123(7): 4735-4761
 [3] Rice, J. (2021, September 27). *INTRODUCING DORA EXPLORER*. Puget Sound Institute. Retrieved April 14, 2021, from <https://www.pugetsoundinstitute.org/2021/09/introducing-dora-explorer/>

2. Explore the depth and the temporal variability at a point of the interest



3. Explore the spatial and temporal difference for two scenarios (e.g. Existing-Reference)



Conclusion

Advantages of web-based visual analytic tool

- Higher accessibility for user by avoiding to install data and software
- Less concern about the software/ library version difference in user system
- Convenience in updating the dashboard
- Keep confidential algorithm secured