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Using Machine Learning to reduce uncertainty in historical ocean temperature measurements

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Historical ocean temperature measurements are important in studying climate change due to the high proportion of heat absorbed by the ocean. These measurements come from a variety of sources, including Expendable Bathythermographs (XBTs), which are an important source of such data. Their measurements need bias corrections which are dependent on the type of XBT used, but poor metadata collection practices mean the type is often missing, increasing the measurement uncertainty and thus the uncertainty of the downstream dataset.

This talk will describe efforts to fill in missing instrument type metadata using machine learning techniques so better bias corrections can be applied and the uncertainty in ocean temperature datasets reduced. I will describe the challenge arising from the nature of the dataset in applying standard ML techniques to the problem. I will also describe how we have used this project to explore the benefits of different platforms for ML and what open reproducible science looks like for Machine Learning projects.