Acknowledgments:

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Data is from Dr. Kirby Sitterley who operated the hydrokinetic reverse osmosis pilot in collaboration with the National Renewable Energy Laboratory.

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List of Papers:

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Draft manuscript is included with this dataset.

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Dataset Description:

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Each CSV file contains an experiment for a hydrokinetic reverse osmosis pilot. During the beginning of each trial, the System Mode is fixed flux (e.g., water treated per unit area of membrane). This is to achieve steady state conditions. Then, the System Mode is changed to cycle feed pressure.

To simulate the increase and decrease of pressure when non-continuous tidal energy is used to power the system, a sine wave is used to set the operating pressure between two values. There are two modes which cycle feed pressure: high and low. The system is controlled by a “feed pump” and a “reject value” which generates pressure across the membrane.

* Flow rates, temperatures, pressures, and calculated flux are the operational parameters.
* Conductivity (surrogate for dissolved solids) is measured in the inlet (feed), treated water outlet (permeate), and the non-treated water outlet (reject).
* Observations are collected every minute.

The clean dataset which combines 11 CSV files contains 25,844 observations with 23 variables.

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Data Quality:

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The CSV files have been combined into a R dataset with two data frames. Four empty variables were removed (Status, Code, Lj.String, and Source), all the variables were renamed, dates characters were transformed into Date class objects, and some string cleaning was performed for readability.

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Dataset Purpose:

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Does variable feed pressure have a significant effect on reverse osmosis (RO) membrane integrity or performance?

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