



Case Study: Reference Manual for Forecasting Intake Debris Events

CLIENT: Electric Power Research Institute (EPRI)

BACKGROUND: Debris events challenge the reliable operation of cooling water intake screening equipment at power plants. Changing ecological conditions are increasing the frequency and severity of debris events and their impacts to plant operation. Additionally, expected gradual, long-term changes in source waterbody conditions will bring new challenges and requirements for managing such events. Forecasting of debris events would allow operators to proactively prepare equipment, verify operational settings, organize personnel, and prepare for potential plant derates. Forecasting of debris events can contribute to effective management of power plant operation, reduce plant downtime (and lost revenue), minimize damage to plant equipment, and improve safety.

CHALLENGE: Forecasting of intake blockage events is a complicated, site-specific, technology- and data-intensive exercise. General guidance on the various components and how they are to be integrated into a single functioning system is needed for the effective management of power plant operation, reduction of plant downtime (and lost revenue), minimization of damage to plant equipment, and improvement to safety.

APPROACH: TWB partnered with Pecten Aquatic (Netherlands) to develop a reference manual for EPRI members. Information was collected during consultation and discussion with EPRI, with facilities developing forecasting systems and software developers, and via responses to a request for information (RFI) from technology vendors. Practical experience, available literature, and other information were reviewed with a focus on existing forecasting systems.

SOLUTION: The TWB and Pecten Aquatic team delivered a [reference manual](#) covering the following:

- How to characterize the debris issue (e.g., type, biomass, frequency, seasonality)
- The importance of accounting for changing environmental conditions
- Operational theory of a forecasting system
- Components of a forecasting system (modeling, monitoring, and IT-related)
- Data requirements for training the system

- A step-by-step guide illustrating how to pull all the pieces together into a functioning system for a hypothetical case study.



Marine macroalgae can suddenly clog intake screens



Freshwater macrophytes can suddenly clog intake screens