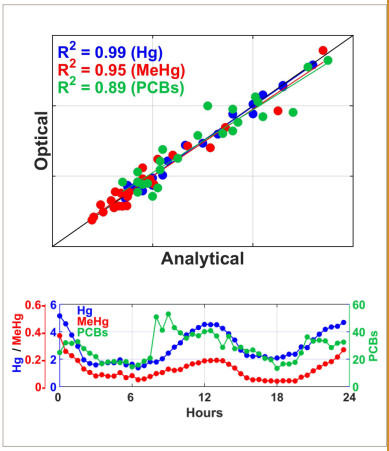
integral consulting inc.

High-Resolution Chemical Monitoring



Benefits

- Cost-effective, high-frequency data collection
- Short-term use or long-term trend tracking
- Larger data volumes than conventional methods at lower cost
- Tailored for specific environmental applications
- Key line of evidence for designing and evaluating remedies

Integral is leading the development and application of optically based monitoring to quantify concentrations of dissolved and particulate contaminants in environmental systems.

It can be expensive and time consuming to obtain water quality data that adequately characterize site conditions and are rigorous enough to support sound, knowledge-based decisions. Optically based monitoring offers high-frequency data collection (on the order of minutes) over an extended time period (weeks to months), making it a uniquely powerful and cost-effective tool for monitoring hydrophobic contaminants in surface water. It can be used to quantify short-term system perturbations, like outfall discharges, as well as longer term trends and patterns, such as recovery of water quality conditions after active remediation. This valuable tool has a wide array of environmental applications, from source identification to monitoring remedial action performance, dredge plumes, and stormwater discharge.

Successful Use at Superfund Site

Although it has long been known that optical measurements correlate with conventionally obtained measurements for many water quality parameters, recent advancements in instrumentation and data processing also allow optical measurements to accurately quantify hydrophobic contaminants at detection limits equivalent to those measured by conventional laboratory analyses. The U.S. Geological Survey used optical measurements to effectively evaluate concentrations of dissolved and particulate mercury and methyl mercury in estuarine wetlands. Building from these efforts, Integral optics experts used optical instruments to quantify concentrations of PCBs, mercury, and methyl mercury in surface water at the Berry's Creek Superfund site over a range of site conditions. High temporal resolution chemical characterization coupled with measurements of particulate dynamics near the sediment bed allowed Integral to demonstrate that surface water contaminant concentrations are strongly correlated to the interaction of organic-rich estuarine solids with the sediment bed. The findings, which bolster our understanding of how site contaminants enter the food web, are critical to the design of an effective remedy at the site.

Benefits of Optically Based Monitoring

Because optically based monitoring involves autonomously deployed instrumentation, a substantially greater volume of data can be collected by this technique than by conventional sampling, and at a far lower cost. The large volume of data supports the evaluation of system water quality over a range of time frames and can be tailored to suit a variety of environmental applications. Integral's study demonstrated that optically based monitoring can develop a unique and critical line of evidence in assessing human and ecological risk and evaluating remedial approaches. This technique has the potential to be an effective tool for a variety of surface water applications where temporal dynamics in contaminant concentrations are important.