

**Poster #21-40**

**Dissolved Oxygen Sensor System for Real-time, In-situ Subsurface Monitoring of the East River Hyporheic Zone in Crested Butte, CO**

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Environmental sensor systems for subsurface dissolved oxygen (DO) concentration measurement are of interest because of the outsized role DO plays in catalyzing a diversity of environmentally important biogeochemical reactions. Commercially available DO sensors cannot provide the desired spatial and temporal density for resolving data over extended periods at the ‘ecosystem level’. We have developed an optical oxygen sensing technology to monitor oxygen concentrations in flowing water, as well as both fully saturated and unsaturated soil with the same sensor.

We have established a remote sensing station at the DOE, East River, SFA in Crested Butte, CO. This station is solar/battery powered to autonomously transmit data from an array of probes deployed in the meander. These include three Opti O2 DO probes that are buried directly under the stream bed at depths of 10cm, 20cm and 35 cm and a fourth probe within the river stream itself. We have been collecting data from all four probes continuously over the last six months, including under winter conditions, at a data rate of one measurement every 5 minutes. The data stream is comprised of eight simultaneous channels, dissolved oxygen and temperature of the river water and the three location under the river bed itself. Our objective is to demonstrate a monitoring technology that provides insight into spatial and temporal variations in dissolved oxygen as a result of hydrological factors, such as seasonal infiltration events and excursions groundwater elevation.