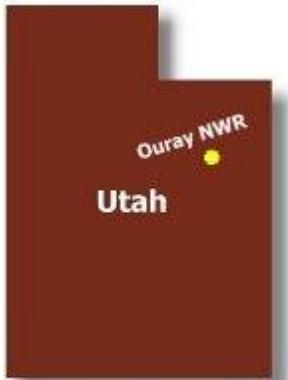


Project: Water Level Monitoring using Remote Telemetry
Client: Ouray National Wildlife Park
Location: Utah
Year: 2001



Intermountain Environmental was contracted to design and install a water level monitoring system for the Ouray National Wildlife Refuge.

Application Notes:

The Ouray National Wildlife Refuge is located in the Uintah Basin of Eastern Utah. The project was created to monitor levels of water in sections of the refuge. The refuge is flooded yearly from the Green River to create a wetland bird habitat. It is divided into sections by using man made dikes as a means to separate wetland areas. This also provides a system to flood parts of the refuge at specific times.

The refuge needed to track and monitor water use in a more precise manner than had been used in the past. Each of the sections within the refuge had been measured and exact acreage of each section was recorded. The monitoring system needed to measure water level in each of the flooded sections and report back using radio telemetry to a base station at the refuge headquarters. Data is logged and water level in each section is recorded for refuge records and water rights issues.

Installation and System Design:

The refuge personnel installed stilling wells at each measurement site within the sections that needed to be monitored. The design of the monitoring network was laid out so that the chain of master sites would run down the center of the refuge and several slave sites would surround each master site. The slave sites would collect data and use spread spectrum radio telemetry to transfer it to the master site. The master site would then transmit the data via RF telemetry to the base station at the refuge headquarters. Master sites had the capability to act as data collection sites as well as repeaters for other master sites. This design allowed us to keep costs to a minimum and to allow for expanding the system for future needs.



IEI personnel installing remote water level monitoring system at Sheppards Bottoms site

Each remote slave site consists of an SE109 SDI-12 shaft encoder with display; 12 volt, 7-amp hour rechargeable battery, a MSX10 10-watt solar panel and an SDI-12 spread spectrum radio. The slave site radios transmit readings at specified intervals to the nearest master site. The master site consists of a Campbell Scientific CR10X Data logger, a 12 volt 12 amp hour rechargeable battery, a 20-watt solar panel, and a FP10C potentiometer float & pulley sensor. The master site also contains an SDI-12 radio which interfaces with the data logger to receive the data from the remote slave units. Each master site transmits its data using VHF radio telemetry, across the refuge to the radio base station at the refuge headquarters.



Close-up of Shaft Encoder, power supply and regulator inside enclosure that is mounted on stilling well.

The radio base station needed to be located in a separate building, which was over 50 yards from where the computer was located. This required us to create a Short Haul Modem link between the radio base station and the computer. The computer runs the PC208W Data logger Support Software from Campbell Scientific.

The network design allows the staff at refuge headquarters to collect data remotely and store it for future reference. The system is totally automated and once the program is started there is little to no user intervention required. The staff has the ability to see real time data at the PC. The staff in the field can also view data by using the CR10KD Keypad Display.

The Ouray National Wildlife Refuge is a great place to view wetland birds in a natural habitat. The refuge provides an auto tour route for interested visitors to drive throughout the park and learn more about the species of bird and other animals that call the park home. If you are ever in the Flaming Gorge area, you should take some time to visit the refuge and enjoy the scenery and wildlife.

For Information on this project or these products please contact:

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