Utility Mapping Services Inc.

Painted Rocks Recreation Area, Darby Montana USA
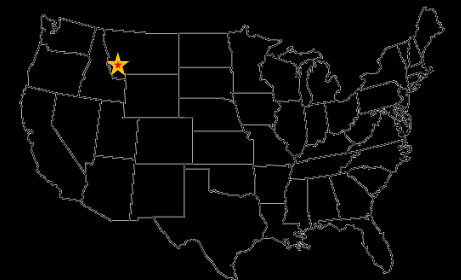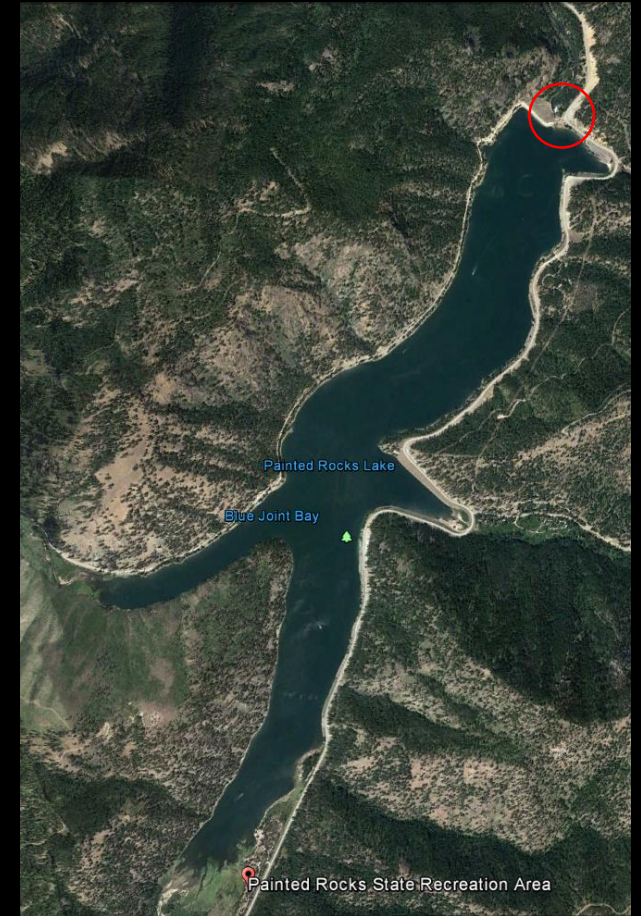Stilling Basin Survev

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UMS, an engineering firm, Clancy Montana USA with offices in Minnesota, Utah, and Washington state.

Specializing in utility location and surveys, USM is expanding into hydrographic survey market to augment current services.

In October 2016, Seahorse Geomatics of Portland Oregon supported USM to conduct high resolution surveys of the Painted Rocks Recreation Area dam in Montana.

Painted Rocks Dam

Survey Purpose
- Plan for future improvements to the dam structure
- Inspect for damage to the baffle blocks and sedimentation in the stilling basin

Survey Challenges
- Reduced GNSS observability:
  - Mountain peaks 300m above dam on both sides of survey area
  - 50m high dam face
  - 8m high sidewalls
  - Required reliance on high-end Norbit INS (AP30)
- Limited Access:
  - No driving access to the stilling basin
  - No boat launch
  - Everything hand-carried
- Limited maneuverability:
  - No room for calibrations
  - No room for generator
  - Electric motor use only


Sled boat for gear transport

Survey Gear

- Norbit iWBMSh (incl. AP30)
- Lenovo X220 Laptop
- Trimble R8 base station
- Trimble HPB450 radio (RTK)
- Knudson 24kHz Singlebeam
- Hypack 2016a

Survey vessel

- 13ft X 4ft flat bottom Jon-Boat
- MinKota trolling motor on bow
- Outriggers (stability)

Norbit iWBMSh mounted to vessel utilizing Norbit Go-Kit. Power for the motor and sonar provided via direct connection to Deep Cycle 12VDC battery. Survey computer powered via internal battery
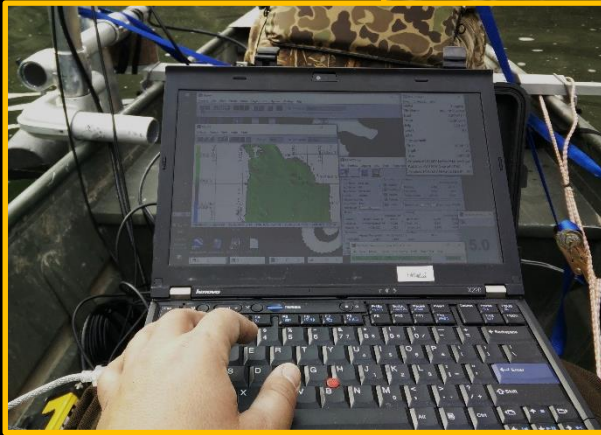
Data Results

- 10cm resolution surface generated.

- Confirmed client suspicion of missing baffle blocks and debris inside the basin. Amount of debris was a surprise.

- Clients impressed with data quality. Now will utilize iWBMSh surveys for dam condition monitoring instead of divers.