NewFields

UAS & USV

Providing state-of-the-art digital 3D models and aerial imagery for a diverse range of applications.

NewFields is a leader in the application of emerging technologies to improve data quality, efficiency, and rapid dissemination of critical information to decision makers through the use of small unmanned aircraft systems (sUAS) and remotely-piloted boats known as unmanned surface vehicles (USV).

We own and operate a fleet of high-quality tools to offer multiple cost-effective imaging and terrain-modeling solutions. From small fixed-wing and multirotor UAS to a specialized camera pod that easily and temporarily mounts to light aircraft, still images are captured and processed into high-quality terrain models and georeferenced image mosaics. A USV is used to complete the picture below the waterline utilizing the latest in portable, survey-grade sonar systems. Data products are rapidly incorporated into GIS to be used in a wide range of applications from managing mining operations, modeling contaminant transport, or monitoring natural resource recovery. Services include:

- Tailings Storage Facility Management
- Coastal Change Monitoring
- Earthworks/Civil Construction Projects
- Natural Resources: Management, Conservation, and Restoration
- Habitat Mapping

How We Can Help

UAS and USV are among a class of emerging technologies that will revolutionize how data are collected and disseminated. We provide our clients state-of-the-art geospatial data products at a fraction of the cost compared to using traditional equipment, with shorter turnaround time and significantly reduced mobilization effort.

Aircrafts & Water Vessels

- **Fixed-wing UAS** – Fully-integrated software and hardware solution for high-res imagery and 3D models
- **Multirotor UAS** – Versatile payloads can include high-resolution video, still photos, or thermal imagery
- **USV** – Safely and reliably generates accurate bathymetric and sub-surface data
- **XCAM Pod** – Temporarily mounted to light aircraft providing a versatile photogrammetry solution for larger areas

Combined Remote Aerial/Aquatic Assessment

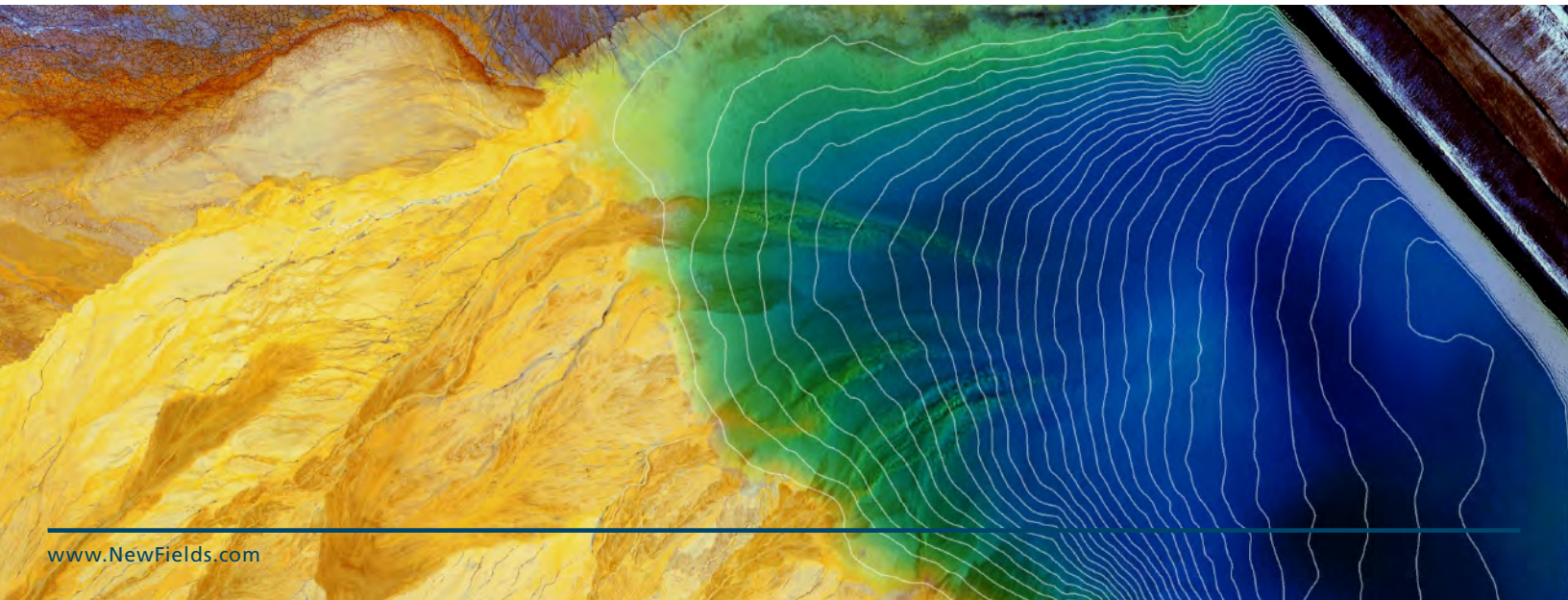
This assessment approach allows us to model the terrain above and below the water surface in a way that is extremely difficult to replicate using traditional methods. Photogrammetric and hydroacoustic data are collected with Real-Time Kinematic (RTK) positioning and processed in a workflow that results in a synoptic site model consisting of a continuous surface above and below the waterline. Incorporating individual datasets in a complementary way is more efficient and improves the final product.

Aerial Systems

Aerial data primarily consists of accurate, geo-referenced red, green, blue (RGB) imagery suitable for generating hi-resolution orthomosaics, 3-D point clouds, and Digital Elevation Models. Additional bands such as near-infrared (NIR) may be used to further extract spatial information concerning vegetation health or soil moisture. Thermal imagery is one of the technologies used by our engineers that can be deployed by UAS.

In-Water Systems

In-water data acquisition is conducted from shore using a remote sensor platform designed for a broad range of applications in marine and inland aquatic settings, which can be safely deployed and operated by a single technician. Depending on the application, the platform can be outfitted with a range of hydroacoustic sensors designed for assessment of submersed plant coverage, delineation of bottom-type & relative density, resource monitoring, or soft-bottom bathymetry in tidal settings. Concurrent data streams such as downward looking video and side-scan sonar can be used to map and classify substrate in shallow water.



Case Study

CHALLENGE

Mine Tailings Storage Facility (TSF) Management

THE APPROACH

TSFs are used by mines to store fine waste (tailings) generated by mill operations. These facilities may be considered finite "resources", and with proper management they can be operated to meet or exceed their designed lifetimes. Operators must carefully weigh the cost of monitoring data with the potential benefit. UAS and USV are a way for operators to quickly, safely, and cost effectively monitor the placement of tailings in the TSF, and determine if the facility is meeting design specification. The exposed tailings surface (beach) is digitally modeled from the air using the UAS, while the submerged tailings within the pond are modeled using the USV. The datasets are seamlessly merged to represent the entire tailings surface to be used for volumetric calculations.

The low cost and rapid turnaround of data allow mine operators to frequently monitor the tailings surface, and make operational changes to optimize storage. The added value offered by these services is demonstrated by the mine's ability to use the data products to improve other TSF-related operations. The information and trends allow managers to predict with greater certainty the timing of future construction to expand capacity, improving the mine's ability to budget and prepare for these large-scale projects. Additionally, mill operations managers benefit from accurately knowing the volume of available water in the pond for water-balance considerations, environmental managers can use the imagery to estimate surface moisture of the tailings beach and monitor embankment revegetation, and construction managers can use the imagery and 3D model around the facility embankment to monitor ongoing construction/earthworks projects.

Innovative problem solving is a core strength of NewFields.

The NewFields Difference

We are rare among consulting firms in that we utilize UAS/USV technology in-house to maximize value on larger programs. Our engineers and scientists embedded in the project work side-by-side with our UAS/USV specialists to evaluate applications and develop unique solutions – this innovative approach to problem solving is our core strength and builds on our greatest asset: our people. If your project requires imagery and terrain data to be validated and signed by a PLS, NewFields can engage locally licensed surveyors to ensure your needs are met.

We were one of the first companies to legally fly UAS for commercial use in the consulting industry. The use of unmanned technology allows our experts to adapt to unique, site-specific field conditions, and gives us the ability to provide data with unprecedented efficiency. Having total control of the data from inception to final delivery helps ensure that complex signals hidden within the data are considered and provides additional value that might otherwise be missed.

Let us help you with your next project and experience the NewFields difference!

About NewFields

NewFields is an environmental, engineering, and construction management consulting firm. We provide access to a global network of recognized experts and professionals who work together to resolve our clients' complex business needs.

Our talented staff is a diverse group of accomplished individuals, most of whom are senior level engineers, scientists, and specialists, who offer our client base both practical and strategic solutions.

We look forward to helping you achieve success and sustainability in a rapidly changing, interconnected world.

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