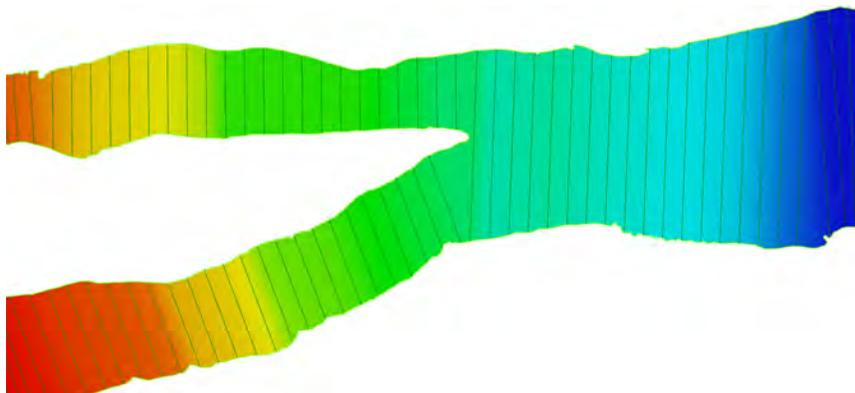
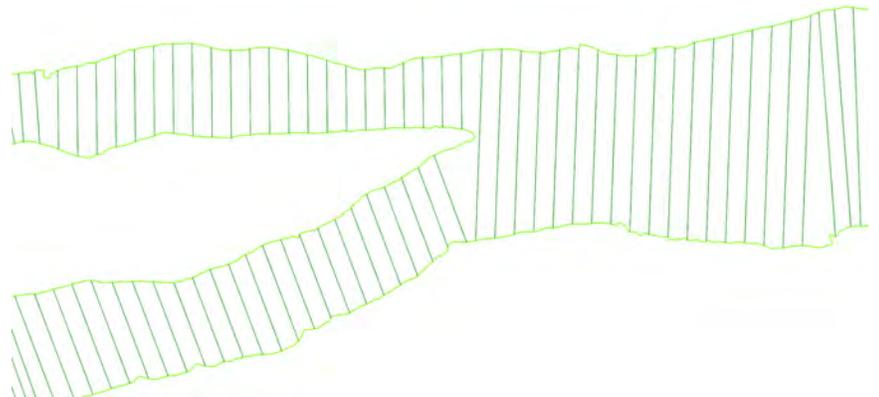


3D Mapping Department In-House Software

Adopting In-House Software in Our 3D Mapping Department Improves Production Speed and Efficiency

To provide our clients with more consistent and higher quality products across shorter schedules, Suredex's Research and Development group continually develops innovations to our production software. Over the years, the collection of software tools used by production staff has been unified into a single, integrated tool, the Suredex Group Tool. It originated in our Orthoimagery department and has since been expanded to our 3D Mapping department for lidar processing. Its implementation has resulted in notable improvements in efficiency and production schedules.

Until now, the 3D Mapping department has been using commercial software only; switching most tasks to Group Tool has enhanced the department's ability to automate production processes. The transition has resulted in greater efficiency, product consistency, a stronger workflow and an overall reduction in production time.

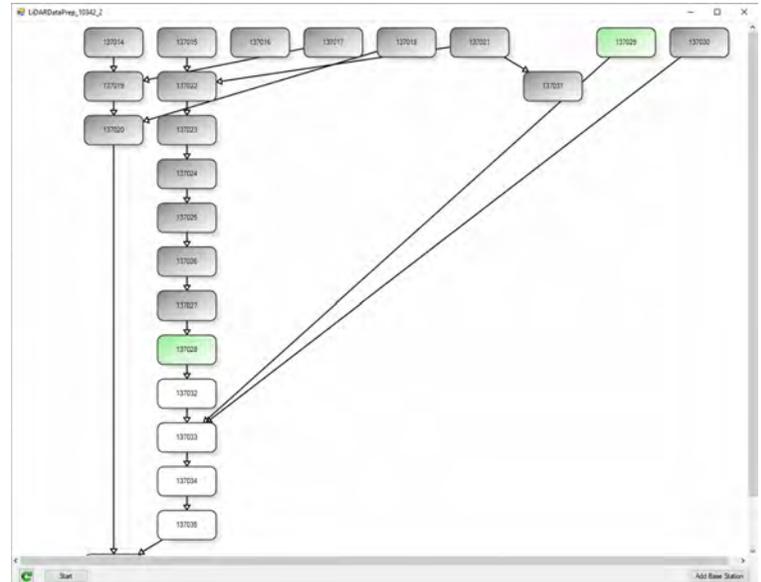


Hydro processing in Group Tool:
elevation lines (top) and
subsequent Triangulated
Irregular Network model
(bottom) of a river segment

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Automation

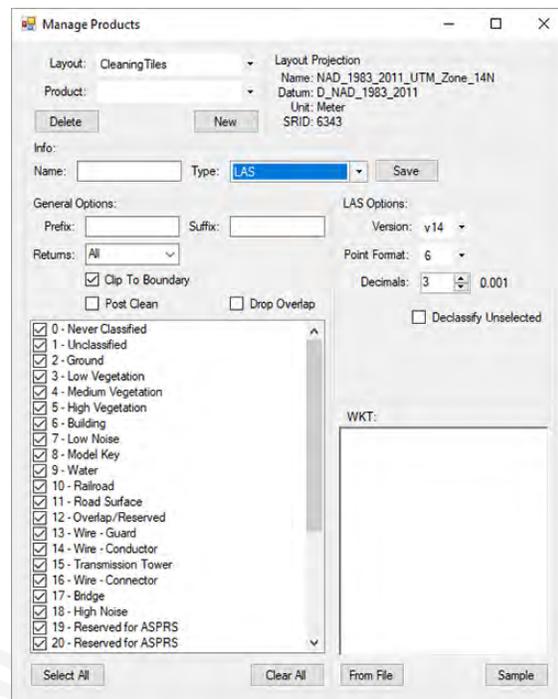
Using Group Tool, lidar projects will require much less manual processing, in part because the software connects to a workflow management tool called APX. This tool progresses a project through a preset flowchart, continuously checking to see if the next processing task can begin, automatically initiating automated steps wherever possible. Group Tool also connects with our distributed processing environment, Hydra, which accesses many servers simultaneously to run tasks, enabling technicians to kick off many processing steps at the same time rather than one by one. And a side benefit of automation is that with fewer manual inputs there is a reduction in the amount of error.



APX flowchart with different bubbles for each step in the process; gray steps are complete, green steps are in progress, and white steps are waiting to begin

Customization

A primary value of moving to Group Tool is that as new tools and functions are developed, they can be integrated seamlessly into production workflows (this applies to both orthoimagery and lidar workflows). Group Tool makes it easy to customize software functionality and parameters of each project. At the time a project begins we can customize the processing environment according to each client's unique specifications (i.e., hydro feature collection parameters such as size), ensuring that our products meet client standards and needs. We can easily and confidently create precisely the right products for each and every client.



Tile layout options in Group Tool



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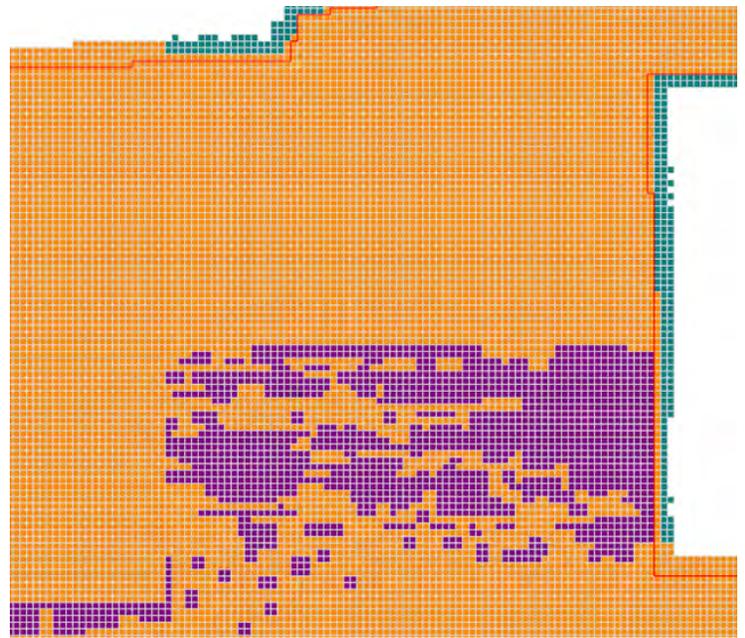
Adopting In-House Software in Our 3D Mapping Department Improves Production Speed and Efficiency

Detecting and Resolving Error

Group Tool has several design features that help detect, diagnose and resolve errors as quickly as possible. Data is broken into smaller subsets, enabling us to reprocess only the affected areas when errors are detected. This saves a significant amount of processing time. Surdex's distributed processing environment, Hydra, flags errors and identifies the type of error encountered, enabling us to isolate and resolve the errors quickly and more efficiently. Our ability to effectively manage errors helps us provide superior quality products and accelerate processing speed.

Enhanced Data Tracking and Reporting

The user interface allows us to easily monitor the progress of every project. At a glance, a user can determine the status of each tile. For more in-depth information, reports can be generated to summarize progress by dataset, task and employee. This function allows managers to monitor overall project progress, and when some component in the workflow is not running efficiently, managers can draw in additional resources to ensure the project stays on schedule.



Project tiles symbolized by status in Group Tool

Summary of Group Tool Benefits:

- Automation reduces the amount of manual processing, resulting in shorter schedules
- Advances work through each phase of production automatically, minimizing downtime
- Enables multiple machines to run tasks simultaneously
- Reduced error due to reduced manual processing
- New tools and functions can be integrated seamlessly
- Customize software functionality to better serve our production staff
- Customize the processing environment according to client's specifications
- Minimize, detect, diagnose and resolve errors
- Project monitoring enables informed, efficient management of resources



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