

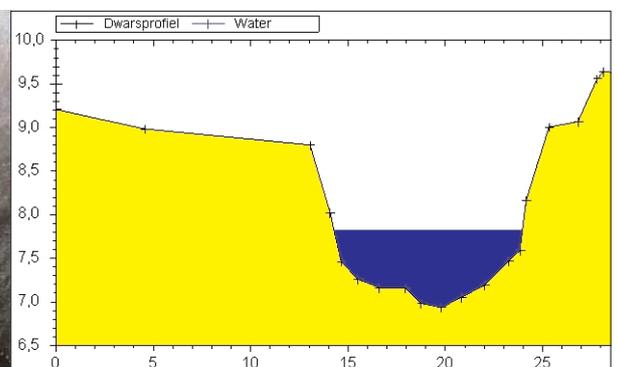
Leica Geosystems **TruStory** Dutch Waterschappen: Using and customizing Leica MobileMatrix



The Association of the Waterschappen (Water Boards) in the Netherlands consists of 27 members, without whom it would not be possible to live in this country where more than a quarter of the land mass lies below sea level. The water boards maintain a vast number of features in the field, such as bridges, culverts and fish ladders. Using Leica MobileMatrix, and customizing its functionality, the Water boards have created a very fast and efficient workflow for collecting information on new and existing features.

The Dutch water boards are responsible for three main tasks: Management and maintenance of the water barriers such as dunes, dikes and quays; water management in terms of quantity and quality, as well as water control and flood defense; and management of waterways and roads. The organization has developed an information system called Integral water boards

Information System (INTWIS) that is based on ESRI's ArcGIS and ArcSDE and uses an Oracle database to store the data. Today, many members of the Dutch water boards use the INTWIS; by the year 2008, every member will be part of it. Keeping the information up to date is extremely important, both feature geometry and administrative attributes must be carefully managed. Most of the water boards employ surveyors to take care of the updates.



Cross Section Profile: the surveyor can check his measurements

■ Challenge

To build and maintain an information system and database that fulfills the primary tasks of the water boards - water management and protection against floods.

■ Project Partner

Association of the water boards, the Netherlands AQUAGIS

■ Date

Project in progress

■ Project Summary

Instruments and Software

Leica GPS1200 and Leica TX1230, Leica Sprinter, Leica TPS1200, Leica DNA03, Leica MobileMatrix on ArcGIS Edition TabletPC, Office Software (ArcGIS, ArcSDE, Oracle, Business Objects)

■ Benefits:

- The check in and check out protocol has eliminated the conversion of data into a number of other formats;
- The direct visual feedback of the features measured ensures quality control for survey measurements;
- The efficiency of this system saves time in the field and up to 30% of the time spent in the office processing data;
- Working with GIS functionality in the field has made the project more interesting and more rewarding;
- The customized system provides unique and distinct functionality that quickly enables the delineation and coding of the field work.

- when it has to be **right**

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Historical Process

Until now, the processes for measuring and updating features in the field have been a time consuming effort. From the central INTWIS database, the data was exported into different formats that were compatible with the existing surveying systems. This workflow created a number of different problems:

- Simultaneously collecting and updating administrative information and feature geometry has been the most difficult task.
- Poor integration of the GIS maps used in the office and the surveying systems used in the field slowed the project's progress.
- Check out and check in of data from the central database was not possible or not streamlined. After field data collection, the information needed to be reconciled with the central data base. This often meant performing a number of conversions before importing the data to the central database - in some cases data was actually entered by hand.

As a result, four water boards teamed together with AQUAGIS to build a system that provides the functionality required in the field. A needs assessment identified the following requirements for the new system:

- Automated reconciliation for data check-out and check-in;
- Support for TPS, GPS and digital level systems;
- Functionality that supports the process of collecting water board-related features, such as profiles, and water-related constructions, such as siphons, wells, dams and weirs.

New Process

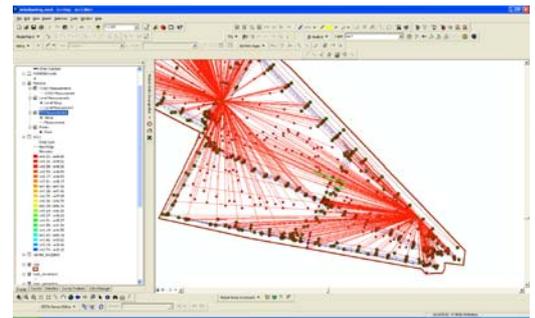
Based on these requirements, the project team chose to develop a system known as "MobielWatis" that is based on ESRI's ArcGIS in conjunction with the Leica MobileMatriX extension. This combination provides the functionality needed for the first two requirements, as well as a strong base for implementing the third requirement that is specific to water board. The specific functionality that was customized for the water boards incorporates the surveyor into the process of measuring and collecting administrative features in the field. For instance when measuring a profile of a waterway, codes have to be attached to the measured points. To streamline this process the surveyor is presented with a dialog that enables this coding by simply clicking on features in the map display. This speeds up the measurements and collection of the administrative data. Similar dialogs have been developed for the water-related constructions such as siphons, wells, dams and weirs to increase productivity. These dialogs make efficient use of attribute domain values for selecting valid administrative attributes.

Effective Measuring of 3D Models with Leica MobileMatriX

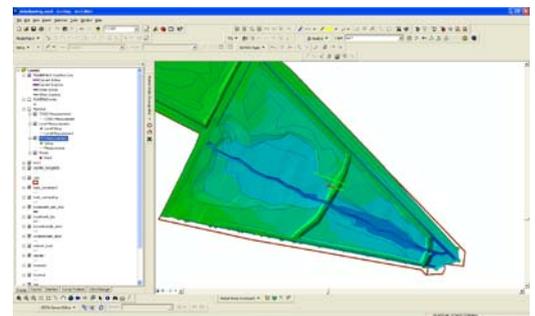
The water board Regge en Dinkel uses MobileMatriX and ArcGIS to generate 3D models of water retention areas. They use a total station with MobileMatriX to collect surface points and breaklines. Following the fieldwork, the data is processed with ESRI's 3D Analyst extension for ArcGIS and visualized with ArcScene.

Using Leica MobileMatriX for field data collection saves the water boards approximately one working day. Normally it takes about a day to process and convert the field data; however, the combination of MobileMatriX and ArcGIS makes it possible to generate 3D models in half an hour.

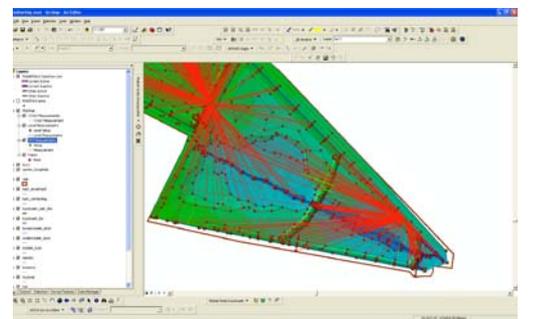
Johan Reefman, water board Regge en Dinkel



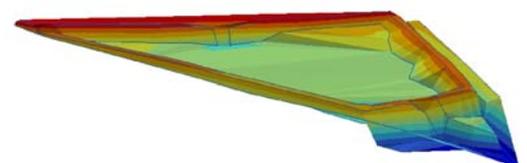
Step 1: TPS Measurements



Step 2: Combined 3D model with survey measurements in ArcMap



Step 3: 3D Model in ArcMap



Step 4: 3D Model in ArcScene