Subsurface Views

Sensors & Software Inc.

Imaging Concrete with GPR

Conquest for Advanced Users

Conquest systems are primarily designed for creating high resolution depth slice images of grid scans ranging in size from 2 x 2 feet (0.6 x 0.6 metres) to 8 x 8 feet (2.4 x 2.4 metres). But what if you want to map out a larger area?

Advanced Conquest users have learned that the EKKO_Mapper program can plot larger Conquest grids that have been "jigsaw puzzled" together. Provided the relative position of each grid has been recorded in the field, a mosaic can be pieced together using the GFP_Edit program (Figure 1a - page 3) and viewed in EKKO_Mapper as a single, large grid of practically any shape.

Simply create a main folder and copy each grid into separate sub-folders. Use the GFP_Edit program to create a GFP file and import each grid using the X and Y Offset parameters to position it relative to the others.

Open the new GFP file in EKKO_Mapper to view all the grids together (Figure 1b - page 3). The combined grid can also be exported from EKKO_Mapper and viewed in 3D using the Voxler 3D visualization software (Figure 1c - page 3).

EKKO_View 2:

A Better View

EKKO_View, Sensors & Software's flagship program for viewing cross-sectional data from the Noggin[plus], pulseEKKO and Conquest GPR systems, has undergone major change to make it more powerful and easier to use. Some of the new features are illustrated here.
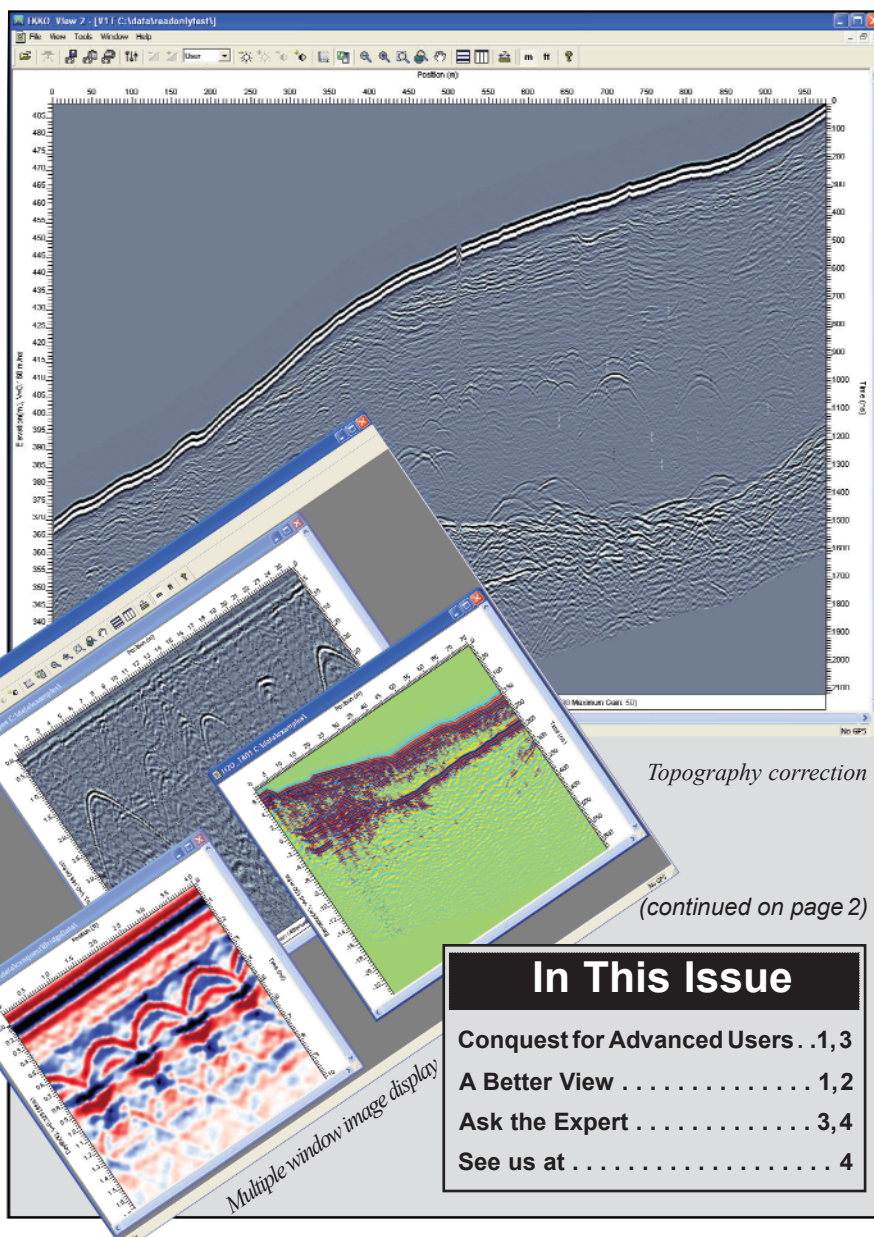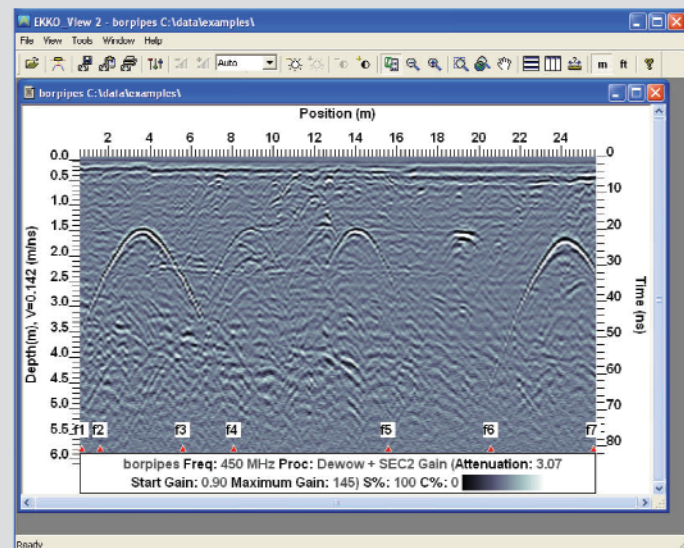

Topography correction

Multiple window image display
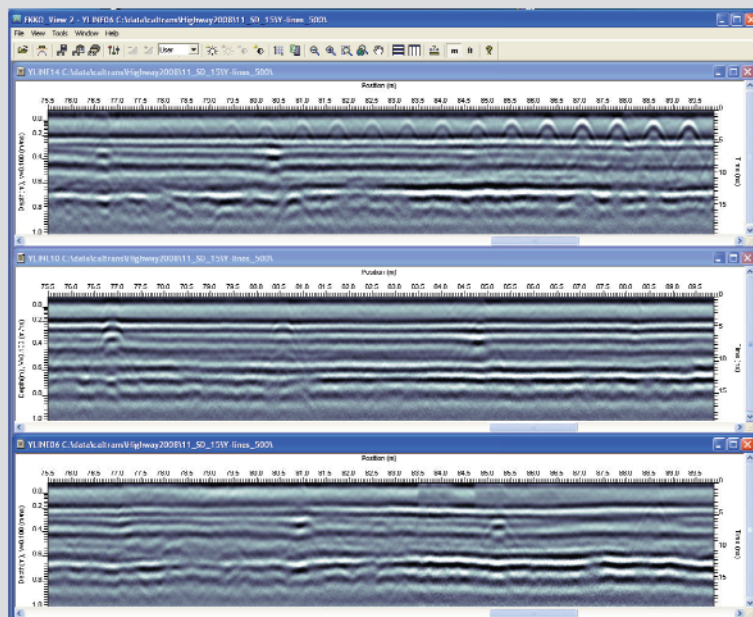
In This Issue

A Better View *(continued from page 1)*

Large data sets with hundreds of thousands of traces can be easily displayed in EKKO_View 2. Zoom out to look at the major features of the data or quickly zoom into areas of particular interest.
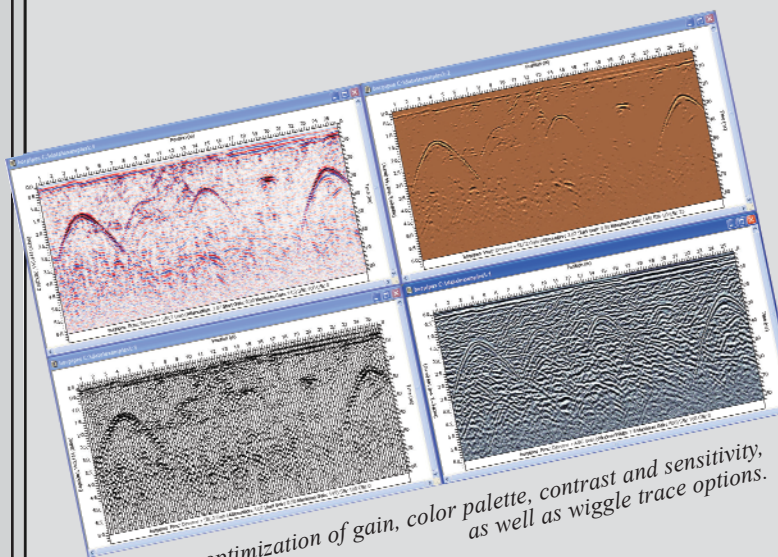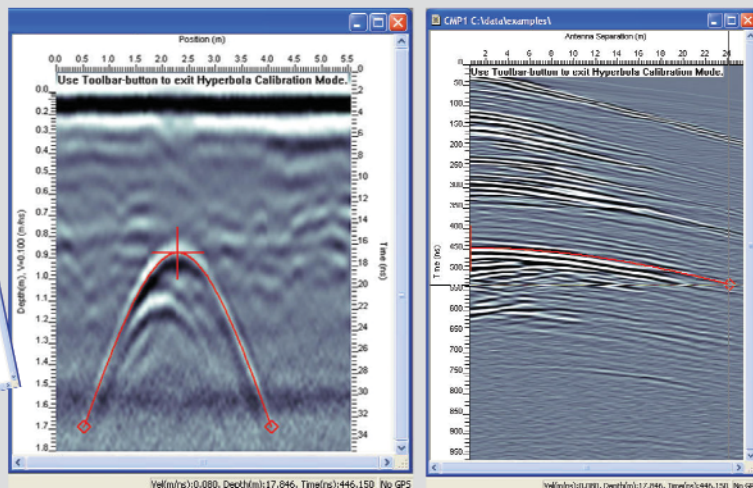
Simultaneous scrolling of linked data images.

Image optimization of gain, color palette, contrast and sensitivity, as well as wiggle trace options.

Velocity measurement from hyperbolas and CMP data files.

Distance(m)	Depth(m)	Time(ns)	Amplitude(mV)	Trace#	Sample#	Latitude	Longitude
4.73	1.046	20.17	-32.228	96	75	36.1091593 N	115.1413538 W
5.591	0.732	13.98	3.302	113	60	36.1091528 N	115.1413557 W
7.304	1.445	28.09	-10.665	147	95	36.1091395 N	115.1413584 W
8.832	1.261	24.44	-8.09	178	86	36.1091275 N	115.1413620 W
9.91	0.73	13.93	3.929	199	60	36.1091190 N	115.1413632 W

Extract position, depth, signal amplitude and GPS positions of any point in the data image.

Customers that mention this article can purchase EKKO_View 2 for 20% off.

Offer valid until February 28, 2009

20% off

For more information, receive an evaluation version or to order EKKO_View 2, call or e-mail sales@sensoft.ca. ■

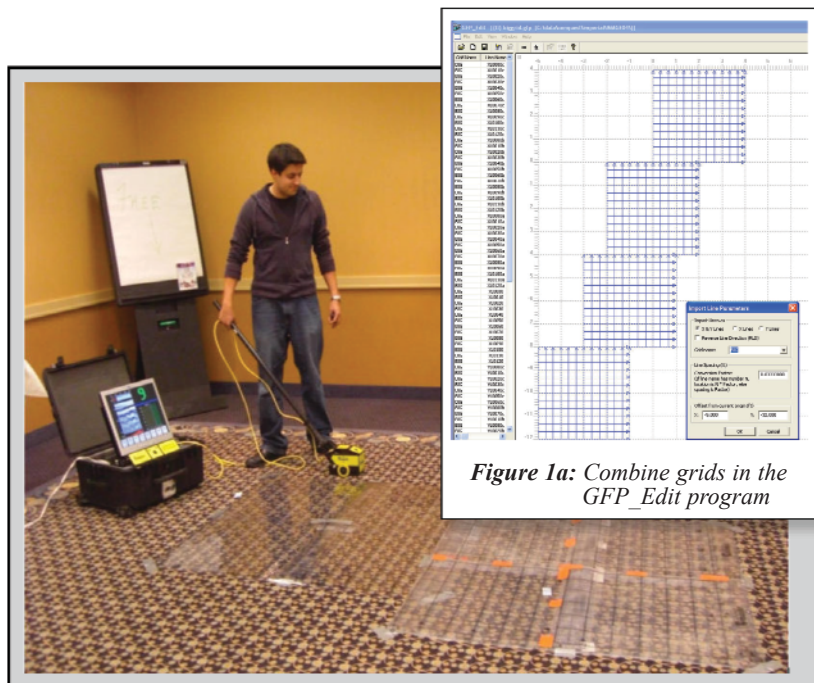## Conquest for Advanced Users *(continued from page 1)*

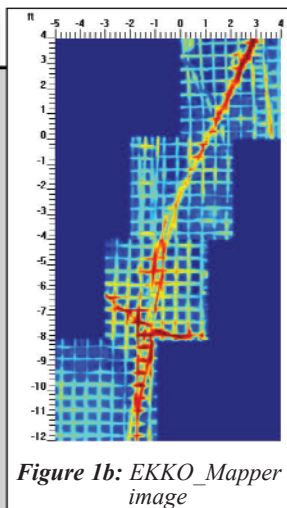*Figure 1a: Combine grids in the GFP_Edit program*
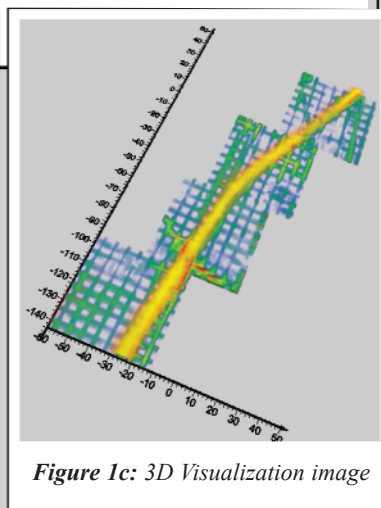

Figure 1b: EKKO_Mapper image

Figure 1c: 3D Visualization image

Figure 1: Data collected during a recent Conquest Workshop shows the process of combining grids. The rebar and a conduit were traced across a concrete floor in four adjacent 4x4 foot Conquest grids.

One of our Conquest customers used this method to produce map images of the floor at a 128,000 square foot airport facility before extensive renovations began.

To learn more and receive a demo copy of EKKO_Mapper, contact one of our application specialists at sales@sensoft.ca. ∎
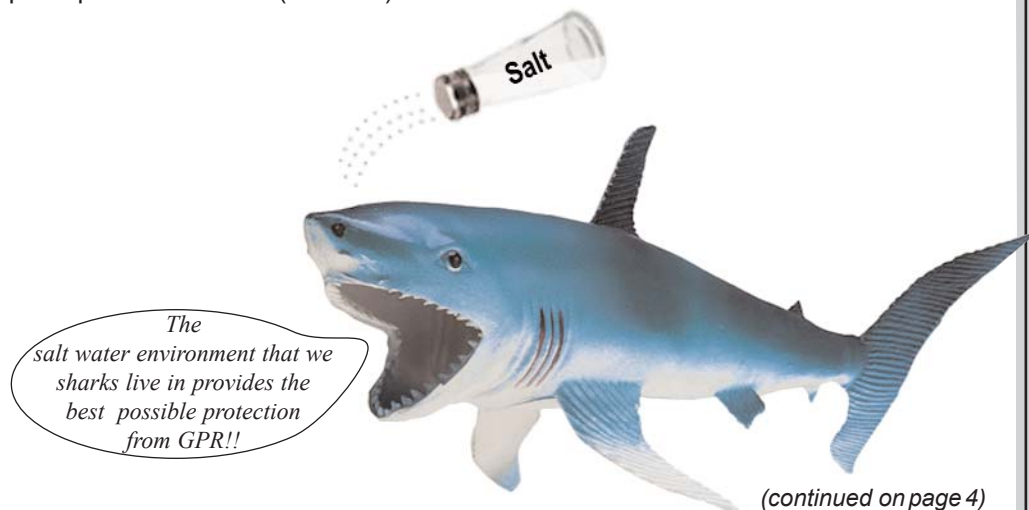
Ask-the-Expert

We plan on using our 1000 MHz Conquest GPR system in a marine aquarium facility. The resident marine biologists are concerned that the GPR signals may be dangerous to the health of the sharks in a nearby tank. Can you provide an answer?

While we do not have data on the effects of GPR on sharks, we can tell you that Sensors & Software GPR systems comply with all GPR regulations including the USA Federal Communication Commission (FCC) and European Union (EU) standards.

More specifically, in the USA, the FCC and the Occupational Safety and Health Administration (OSHA) specify the maximum levels of electromagnetic fields for humans (see page 4). These levels vary by frequency but in the typical GPR frequency range of 10 to 1000 MHz, the lowest level is 0.2 milliWatts per square centimeter (mW/cm^2).

Power density levels of Sensors & Software GPR systems are less than 0.001 mW/cm^2; at least 200 times lower than the limit. Cell phones and even laptop computers emit more electro-magnetic power than a GPR system.

The salt water environment that we sharks live in provides the best possible protection from GPR!!

subsurface imaging solutions

Recent Technical Papers

1. Geophysical Survey in Archaeological Field Evaluation, English Heritage, v1.5, 60 pages
   By: A. David, N. Linford, P. Linford
   2008   **ref 383**

2. Ground-penetrating-radar response to fracture-fluid salinity: Why lower frequencies are favorable for resolving salinity changes, Geophysics, Vol. 73, NO. 5, 6 Pages
   By: G. Tsoflias, M. Becker
   2008   **ref 384**

Upcoming GPR courses

One Day Noggin® Short Course
March 2, 2009
May 4, 2009

Our Noggin® short courses are offered throughout the year to anyone interested in learning more about GPR and subsurface imaging.

One Day Conquest™ Course
March 3, 2009
May 5, 2009

Our Conquest™ courses are offered to anyone interested in learning more about our concrete imaging instrument.

Imaging Concrete with GPR - February 10, 2009 - Anaheim, CA
- February 12, 2009 - San Francisco, CA
- March 24, 2009 - Miami, FL

See us at ...

World of Concrete
Las Vegas, NV
February 3 - 6, 2009
www.worldofconcrete.com

Utility Products Conference & Exposition
San Diego, CA
February 3 - 5, 2009
http://upe09.events.pennnet.com/fl/index.cfm

CGA
Orlando, Fl
February 17 - 19, 2009
www.cgaconference.com

CSDA
Cancun, Mexico
March 2 - 7, 2009
www.csda.org

SAGEEP 2009
Fort Worth, TX
March 29 - April 2, 2009
http://www.eegs.org/sageep/

Information Request

Please check off information required below and fax or Email back:

- ☐ pulseEKKO® PRO
- ☐ Conquest™
- ☐ ConquestView
- ☐ Noggin® Systems
- ☐ OEM Noggin*plus*
- ☐ RoadMap™
- ☐ Rental Information

- ☐ EKKO_Mapper
- ☐ EKKO_View
- ☐ 3 Day GPR Short Course
- ☐ 1 Day Noggin® Short Course
- ☐ Imaging Concrete with GPR workshops
- ☐ Other (please specify)

ASk-the-Expert *(continued from page 3)*
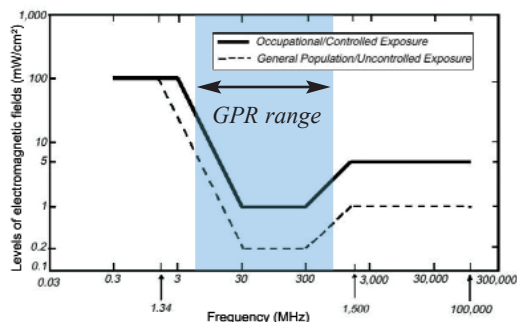
OSHA specify the maximum levels of electromagnetic fields for humans.

Finally, the good news for sharks that may be more sensitive to radio signals than humans is that the salt water environment they live in provides the best possible protection.

Since salt water has an electrical conductivity of about 3000 mS/m, all GPR signals are completely absorbed before they can travel even 1 inch in salt water. So even if the GPR system was placed directly on the glass of the tank, no signals would reach the sharks. ■