



The Role of Time-Series Management in Hydrology

The KISTERS Objective.

The effective management of the resources water and energy as well as the improvement of air quality are the key challenges of our and future generations.

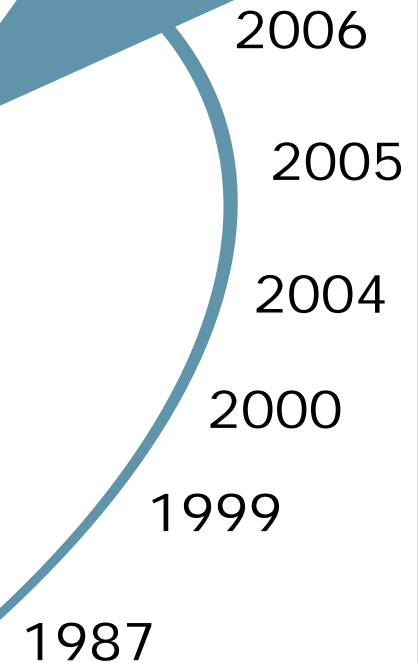
KISTERS, being a company specialized in environmental informatics, develops and distributes software solutions for resource management as well as for environmental protection and safety.

KISTERS IT-solutions play a key role in the successful achievement of these goals, today and tomorrow.

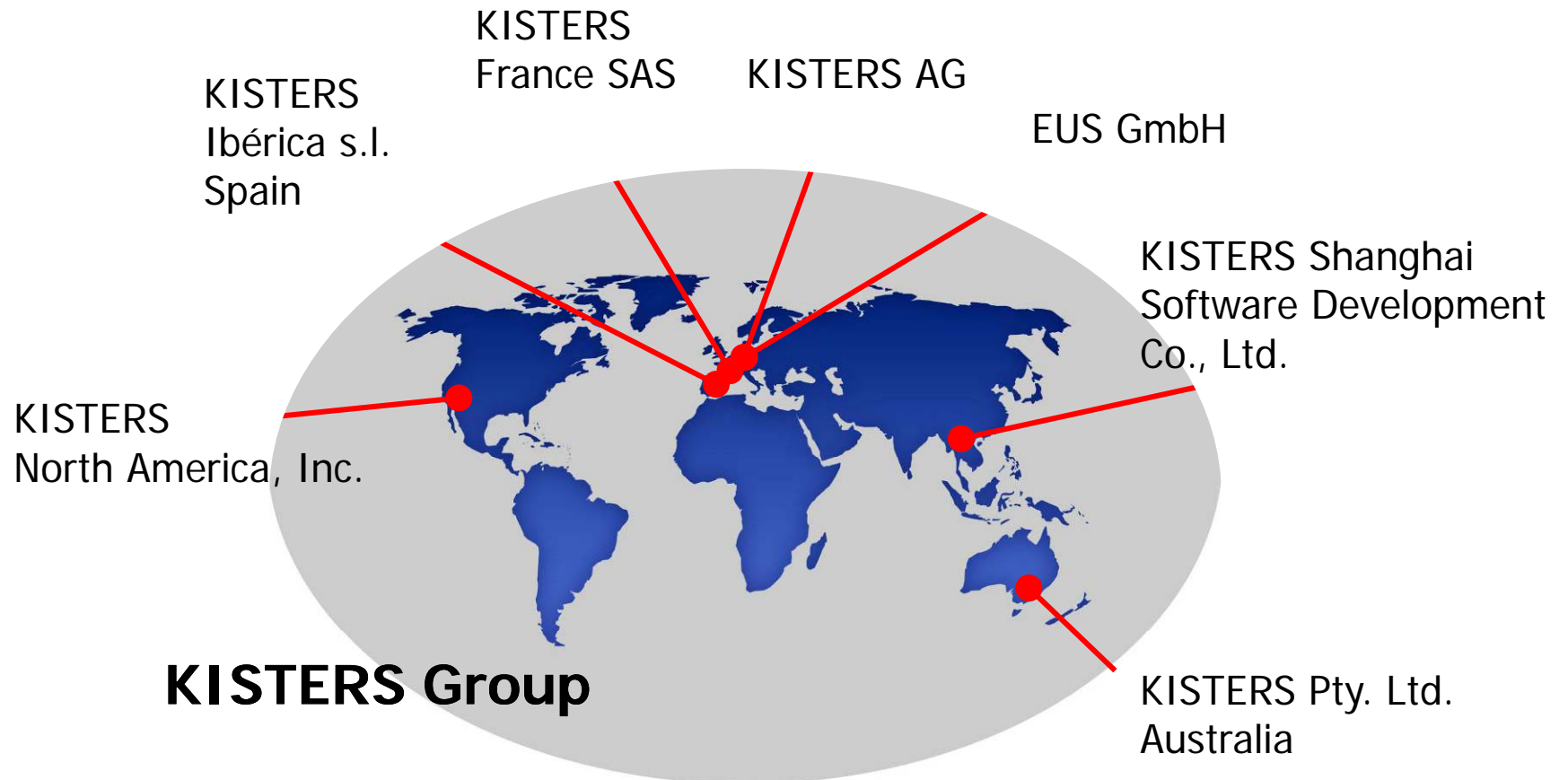


A Company with Sustainable Growth.

- Acquisition of EUS GmbH – decentralized power generation and renewable energies
- Acquisition of deneg GmbH – optimization methods and process control systems for energy management
- Acquisition of Hydstra Australia and North America – worldwide resource management
- BelVis. Software for Europe's deregulated energy market
- Acquisition of the EHS department of Siemens-Nixdorf
- WISKI. The first hydrological software with database-based time series management
- First software for the digitization of water level data
- The engineering company KISTERS for hydraulic engineering and water management

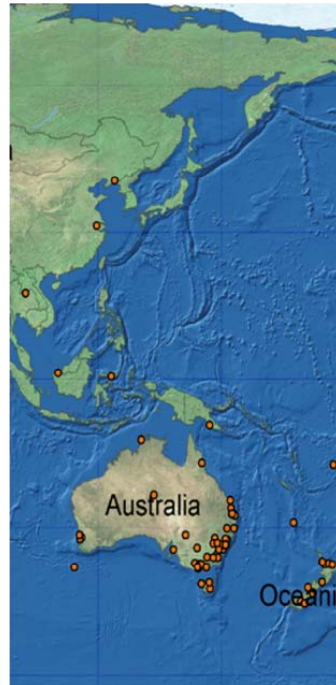


The KISTERS Group.

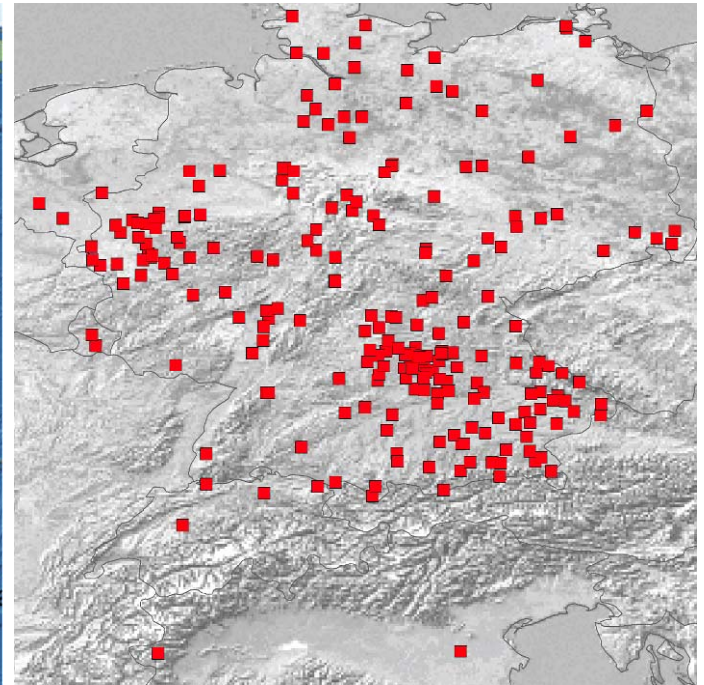


A Firm Basis – 1.000 B2B Customers.

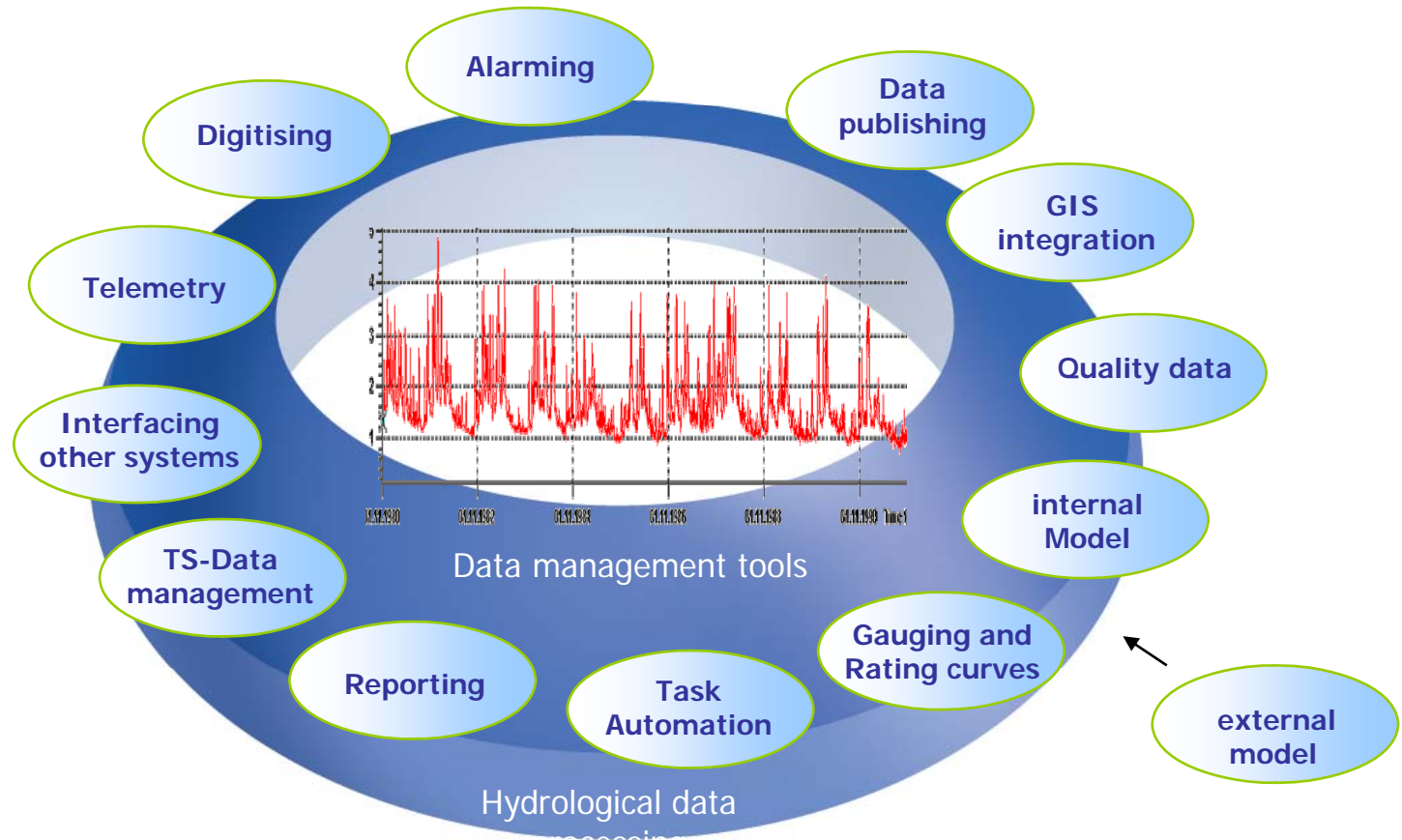
Water management



Energy market



Hydrological data management processes...



Hydrological Management

BIBER

Discharge measurement and evaluation

DIGIT

Digitisation of time series from chart recorders

SODA

Telemetry system

WAM

Alarm Manager

SKED

Rating Curve Editor

WISKI WQM

Water Quality Extension

STATISTICS

Statistic Package

WCS

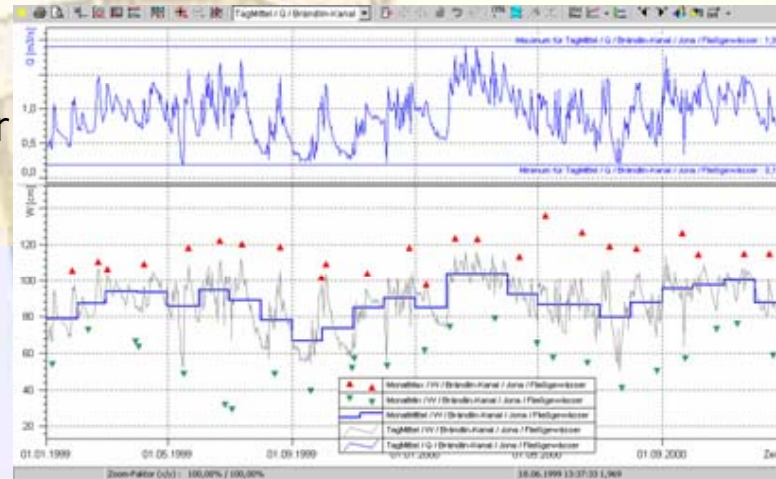
Calculation Server

Kisters WEB

Data warehousing

ArcGIS Ext.

Setting point data into spatial context



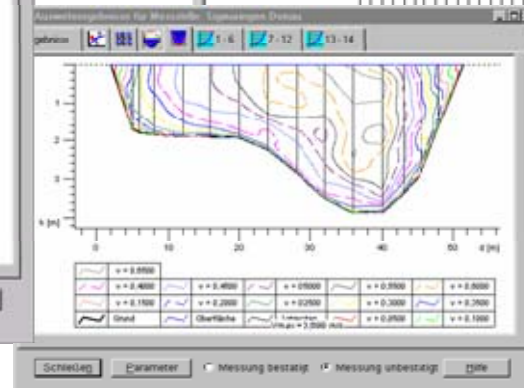
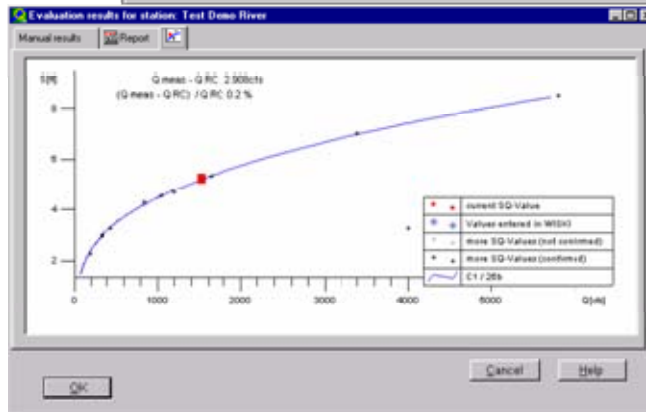
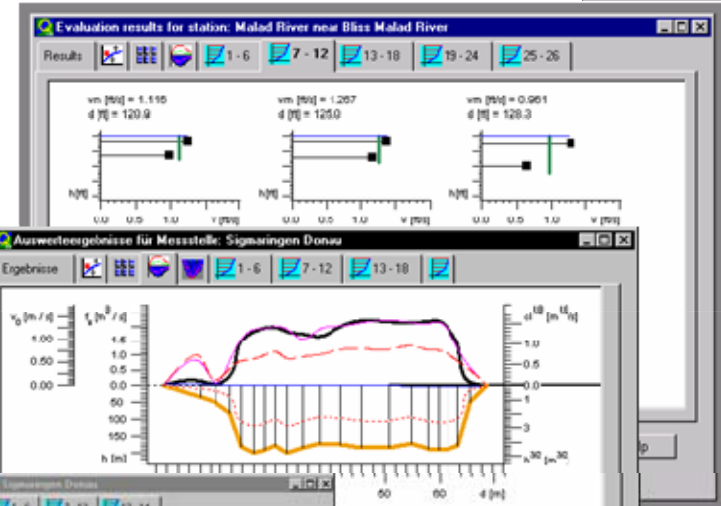
Discharge measurement evaluation using BIBER



Vertical
management

Survey of recorded verticals
Station: Malad River near Biss River name: Malad River Date of the measurement: 10.03.2000 09:30

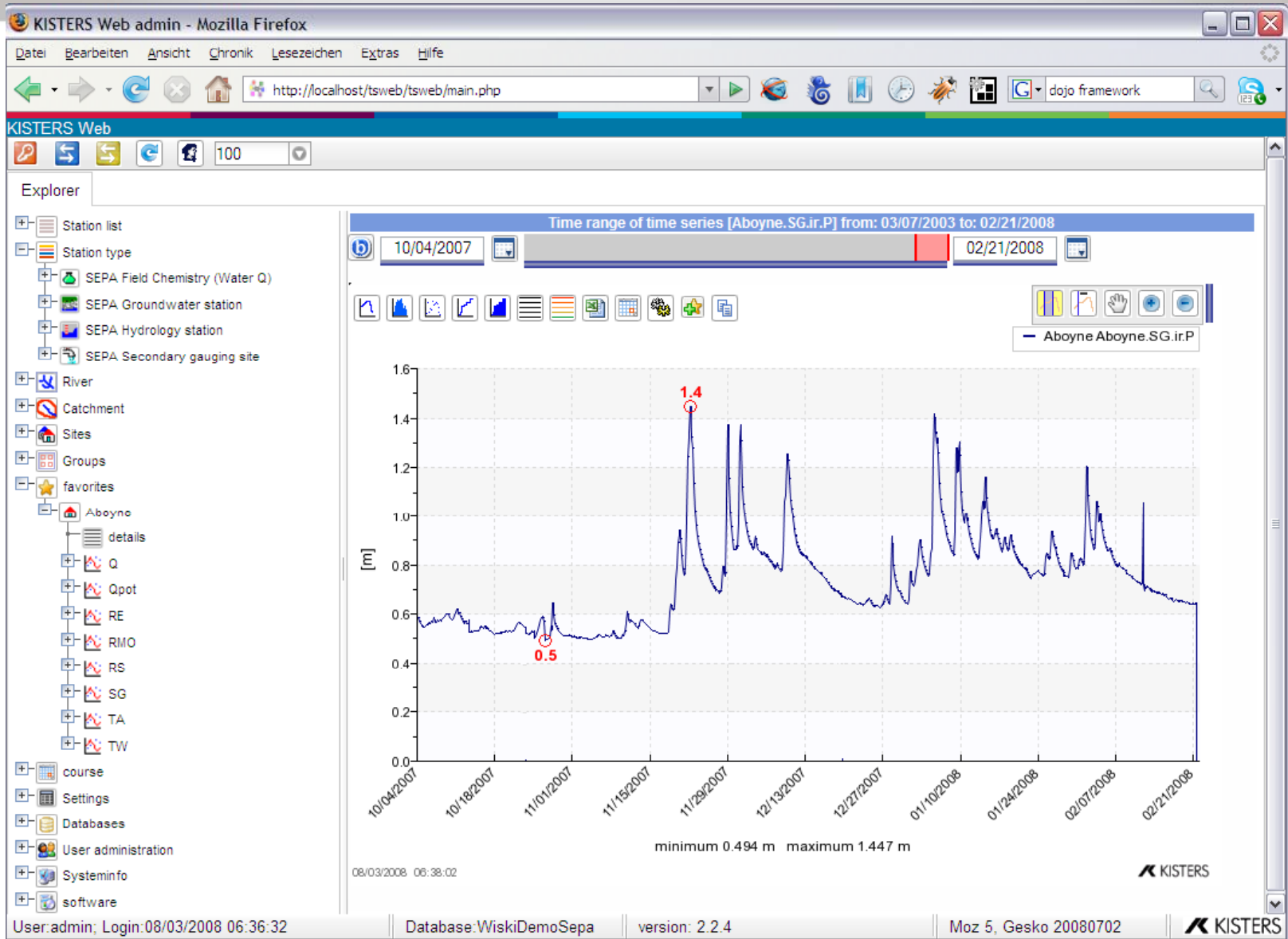
No.	B/V/d	Date / time	d [ft]	h [ft]	Kind of measurement	valid
1	E	10.03.2000 09:39	87.0	0.00		yes
2	V	10.03.2000 09:39	90.0	0.95	1-point measurement	yes
3	V	10.03.2000 09:42	95.0	1.90	1-point measurement	yes
4	V	10.03.2000 09:44	100.0	2.30	1-point measurement	yes
5	V	10.03.2000 09:46	105.0	2.40	1-point measurement	yes
6	V	10.03.2000 09:49	110.0	2.70	3-point measurement	yes
7	V	10.03.2000 09:53	118.4	2.90	2-point measurement	yes
8	V	10.03.2000 09:56	120.9	3.10	2-point measurement	yes
9	V	10.03.2000 10:00	125.0	3.50	2-point measurement	yes
10	V	10.03.2000 10:03	128.3	5.00	2-point measurement	yes



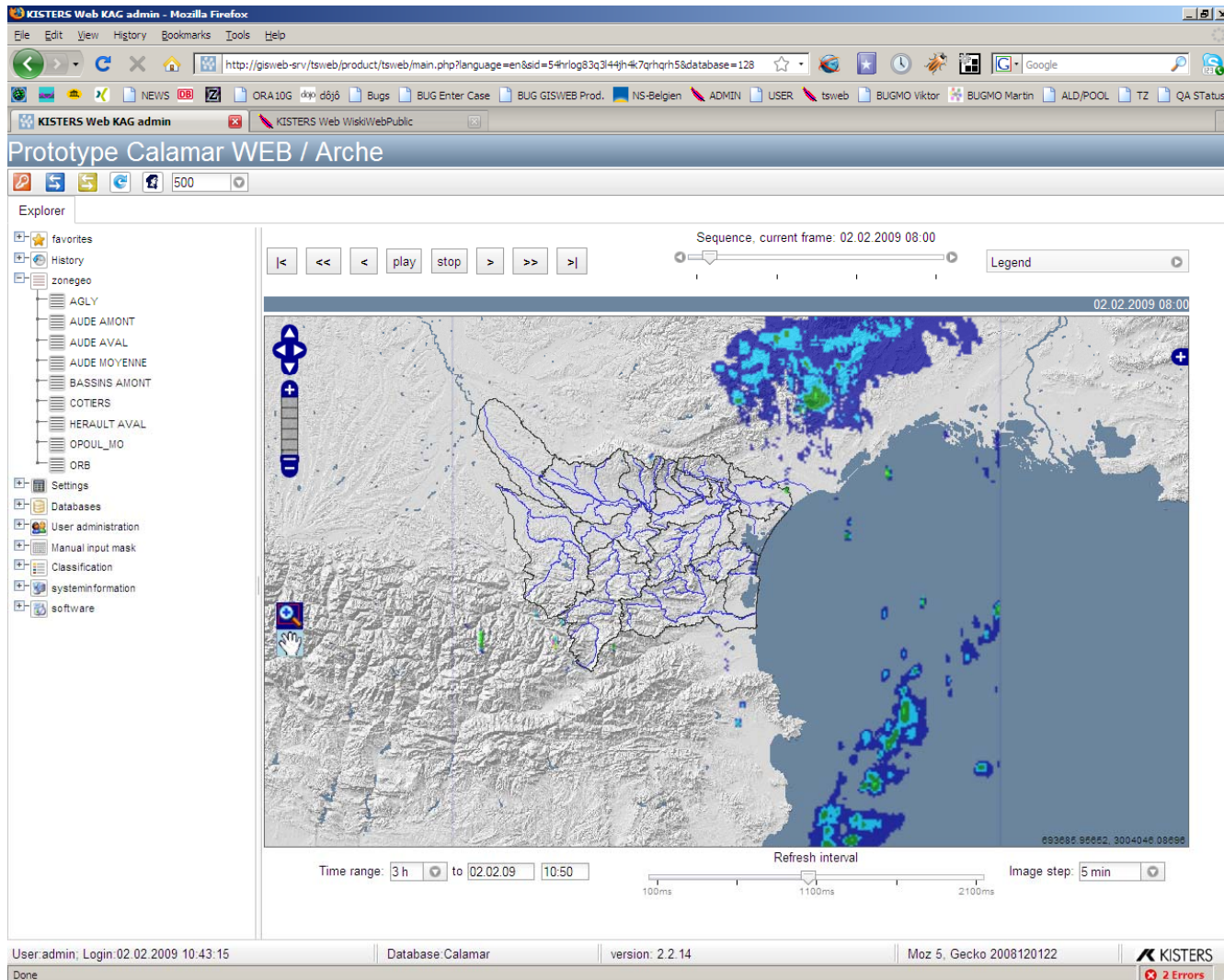
Velocity distribution
Cross Section

Rating Curve Comparison

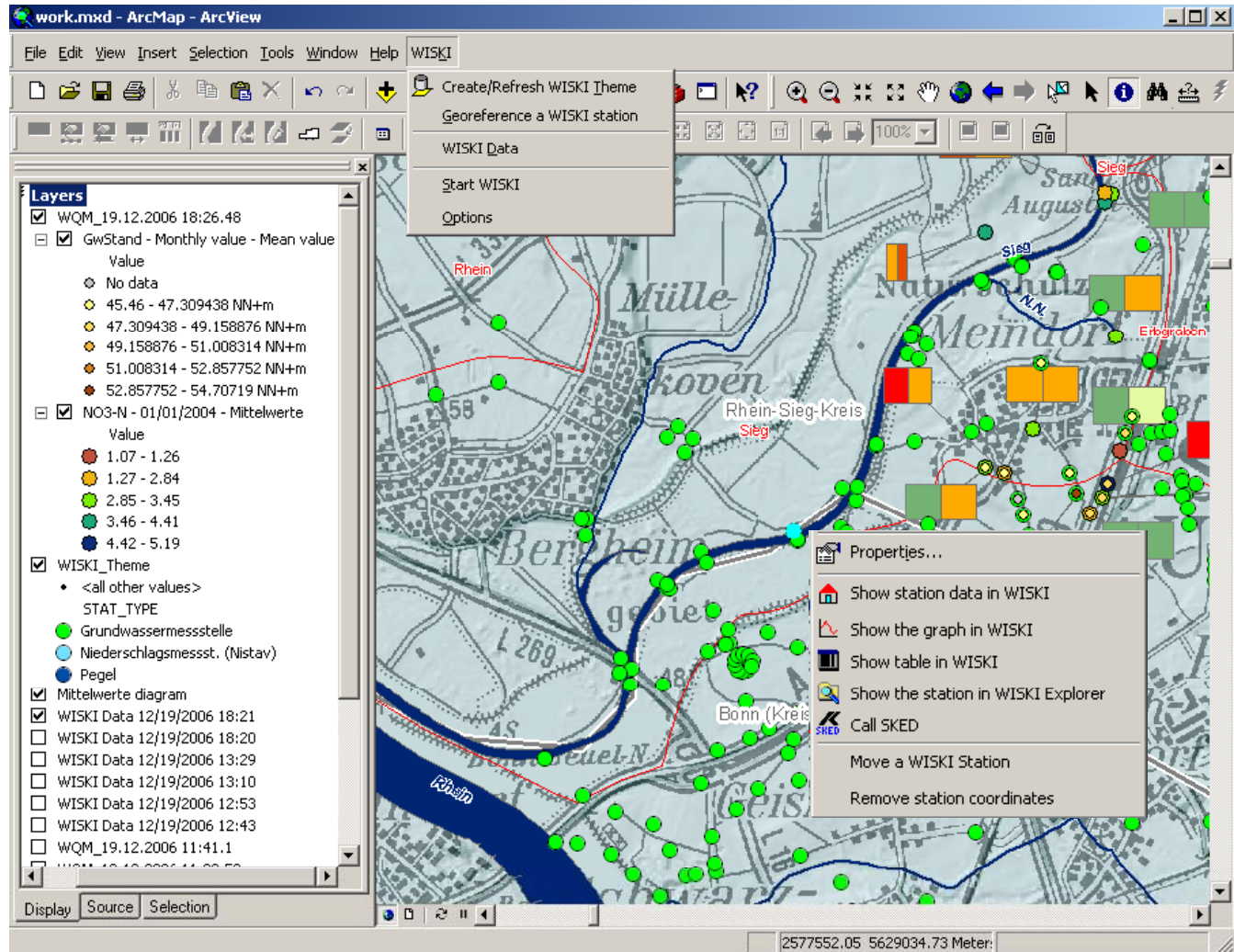
KISTERS WEB



Precip radar information as raster time-series

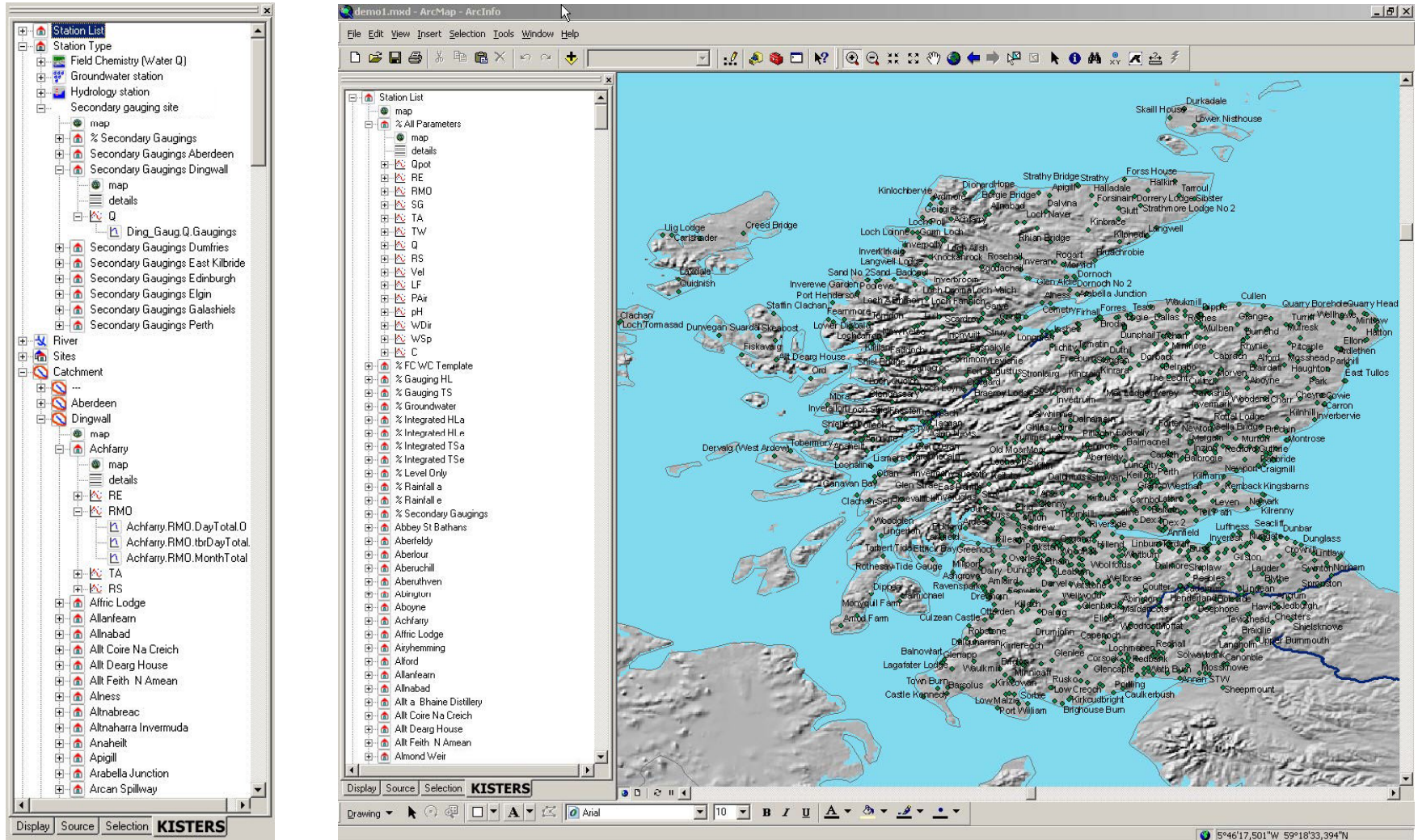


ArcGIS-Extension



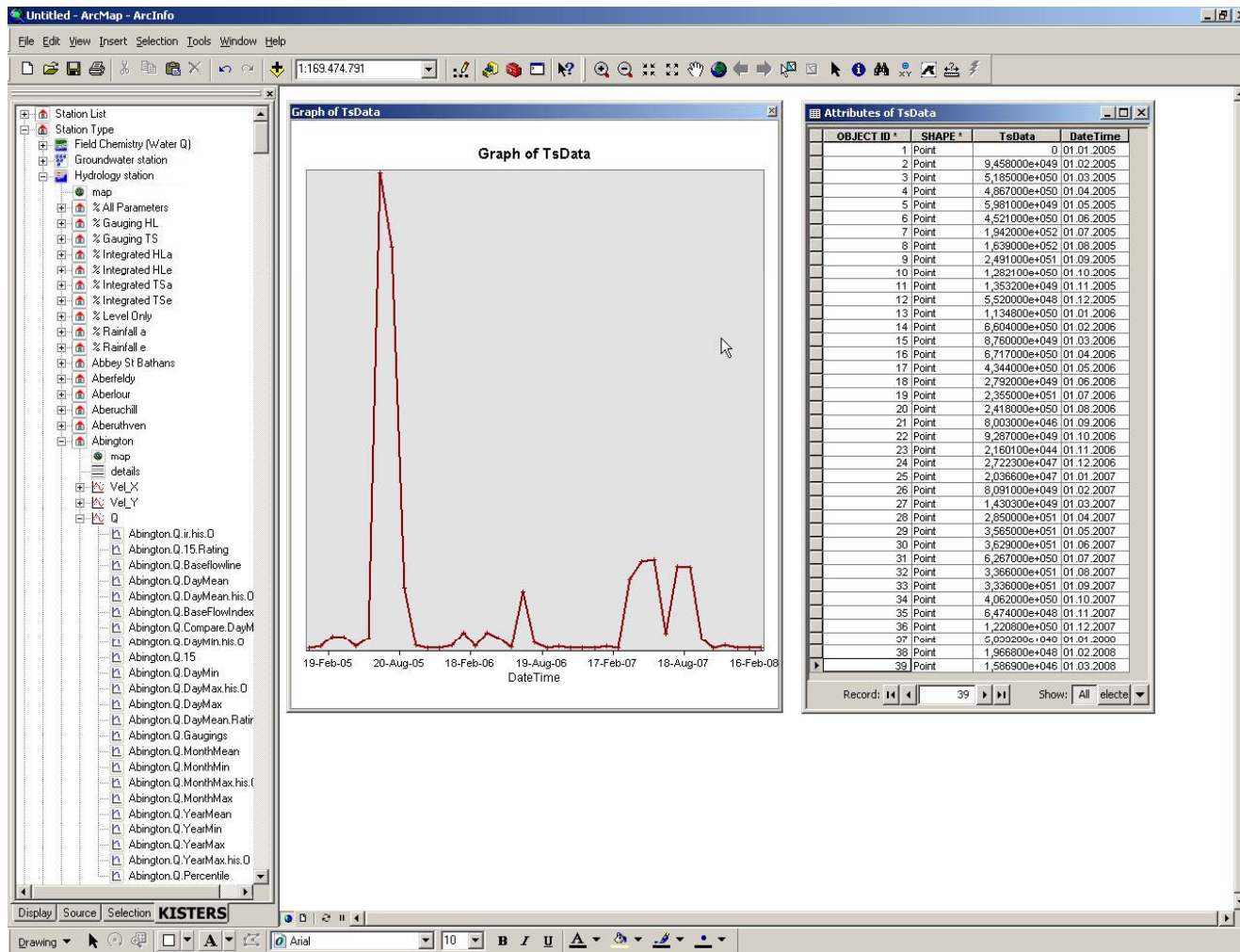
ArcGIS Extension

New tree navigation with direct access to time-series storage

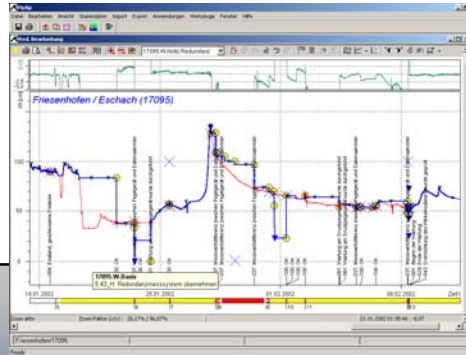


Retrieve temporal data into ArcGIS

selected subsets are integrated into file-based GDB to be used in CHARTs or Tracking Analyst, spatial analyst, ...



DATA SOURCES



KISTERS TSM Storage



Using Various protocols: (s)ftp, http(s), gprs ,gsm, radio, satellite, tcp/ip, filesystem

Datalogger
... ~ 100

Data formats
... ~ 150

Manual input

DIGIT

**BIBER:
Discharge
Measurement**

**WebServices
WaterML
..... ~ 20**

**Databases
ArcHydro, ODM
..... ~ 15**

Hydrological Stations and Data Loggers

protocols and raw data formats of remote call stations and dataloggers:

- BAI (D)
- Comtex (D)
- Gesytec (D)
- Läufer (D)
- Hoffmann Messtechnik (D)
- OTT (D)
- Quantum (D)
- SEBA (D)
- Theodor Friedrichs (D)

- Thies (D)
- W.A.S. (D)
- Logotronic (AT)
- SAT (AT)
- Sommer Messtechnik (AT)
- Kern (CH)
- Rittmeyer (CH)
- MTX (IT)
- CPL (F)

- Amass Data (US)
- CDI (US)
- Delta-T Devices (US)
- Enviro Labs (US)
- Sutron (US)
- Telemark (US)
- Campbell (UK)
- Grants Datataker (UK)
- Hydrological Services (UK)

- Mace (AUS)
- Mindata (AUS)
- Unidata
- Valcom



DATA EXPORTs & Access

APIs:
Basic, JAVA

Data formats
... ~ 150

Reports in
PDF, BMP,
XLS,

WMS,
WFS

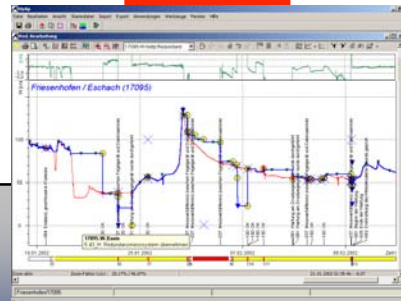
WISKI
Web

ArcHydro

ArcGIS Ext.

WebServices
WaterML
.....

Using Various protocols: (s)ftp, http(s), tcp/ip, filesystem



KISTERS TSM Storage

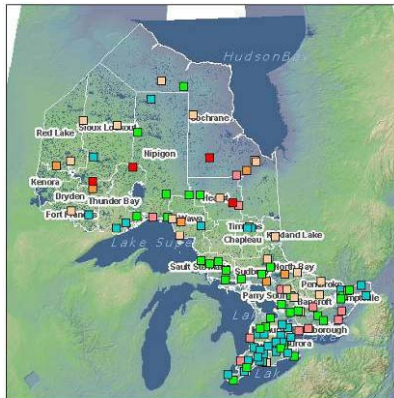
Case Study: Ministry of Natural Resources Ontario



Ministry of Natural Resources | ministère des Richesses naturelles



[English](#) | [Français](#)



The new hydrometric archiv

- 500 river gage
- 1000 climate stations
- 300 snow courses
- Fail-safe infrastructure (two locations)
- 5-10 concurrent user
- 50-100 web user

Case Study: Environment Agency, England



creating a better place

The new national hydrometric archive of England and Wales

The **HARP** Project of the Environment Agency

- ~50.000 stations
- 300 concurrent user
- 600 maximum user
- 230 GB national archive



Pictures are taken from the EA web site

Benefits

- **central database** means reduction of costs for hardware and software maintenance
- **Improvement of data quality** by uniform procedures and central quality controls
- **increase of productivity** by automation of workflows and provision of a integrated seamless solution
 - no staff increase, by growing work load
- Bring back topics into daily work by using “**ready-to-go**” techniques
- **ROI after 2,5 years**
- Availability of: training, consulting, maintenance, support, continuous enhancements, online-help, use-case descriptions

Selected References

Resources water & air

- Bavarian State Agency for Water Management, Germany
- Coca Cola Germany
- DDE Dordogne, France
- Hydro Tasmania, Australia
- Ministerie van de Vlaamse Gemeenschap – AMINAL, Belgium
- Ministry of Natural Resources, Ontario, Canada
- Ruhr Association, Germany
- Shanghai Pudong Hydrology & Water Resource Administration, China
- Swedish Meteorological and Hydrological Institute, Sweden
- Tyrol Gydro Power, Inc., Austria
- German Federal Waterways and Shipping Administration, Germany

Energy

- BS|Energy, Germany
- Cegedel, Luxemburg
- E.ON Mitte AG, Germany
- E.ON TEAG, Germany
- ENDESA Italia, Italy
- Enel.it S.r.l., Italy
- MVV Energie AG, Germany
- N-ERGIE AG, Germany
- rhenag Rheinische Energie AG, Germany
- RWE Energy AG, Germany

The Reasons for our Success.

- Innovation thanks to our interdisciplinary team of computer scientists, engineers, natural scientists and hydrologists.
- Technological advantage over the international competition
- Good scalability of our solutions
- Our quality guarantee - for secure, load resistant systems
- Close customer relationship due to regional and international subsidiaries
- From product concept to the implementation – all services from one source
- Leading position in Germany, international acknowledged expertise, unique expertise in time series management
- Sustainability as a business goal

Thank you for your interest!

KISTERS North America, Inc.
7777 Greenback Lane, Suite 209
95610-5800 Citrus Heights CA

Telefon: +1/ 916 723-1441
Fax: +1/ 916 723-1626

info@kisters.net
www.kisters.net