KISTERS Australia News

December 2017

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From The GM's Desk

By Bill Steen, General Manager, KISTERS Pty Ltd

I know I mention this every year, but the year seems to have flown past yet again, or is this a reflection of my age!

What an amazing year we have had both personally and work related.

One of the highlights for me was a presentation that was given by Dr. David Maidment from the University of Texas. I was attending various internal company meetings in Sacramento the week leading up to the KISTERS North America user group meeting. This week also coincided with the events leading up to hurricane “Harvey” making landfall in Texas. Dr. Maidment was one of the keynote speakers scheduled for the user group meeting.

Behind the scenes KISTERS have been working with Dr. Maidment for some years on projects such as CUAHSI, World Water Online, and more recently the National Water Model. The National Water Model is backed by The University of Texas, ESRI and KISTERS.

Then hurricane Harvey hit.

Dr. Maidment contacted KISTERS North America on the Friday the hurricane made landfall to say he was seconded to assist with the Texas Division of Emergency Management team, hence unavailable for this presentation the following Monday. Due to KISTERS involvement we were able to see in near real-time the forecasts the model was predicting along with the inundation maps and statistics from the KISTERS Sacramento office.

However, all was not lost as Dr. Maidment arranged to do a remote presentation for the KISTERS user group meeting live from the Emergency Management centre. Dr. Maidment was able to expand on the events leading up to and to date on the responsiveness of the National Water Model and how it was assisting emergency services in managing the extreme weather conditions. Words do not give full justice to Dr. Maidment presentation. He held the audience spellbound.

Dr. Maidment believes that “tweaking” of the model and an expansion of monitoring sites could further enhance the forecast warnings time frame to allow emergency services to be better positioned for events of this and other magnitudes, resulting in a reduction in the loss of lives and damage. As it stands hurricane Harvey’s estimated damage bill was nearly US$200 billion. In a four-day period, many areas received more than 1,000 mm of rain as the system slowly moved over eastern Texas. The resulting floods inundated hundreds of thousands of homes, displaced more than 30,000 people, and prompted more than 17,000 rescues.

KISTERS has been working with Dr. Maidment for many years now on a variety of projects, which ultimately resulted in the National Water Model. To see this jigsaw of data ingest from multiple agencies, combined with GIS information, and along with the model come to fruition and prove its value to the community in such a devastating event was a testament to Dr. Maidment's foresight and drive.

If you would like to find out more about Dr Maidment's work, you can view many of his presentations at http://www.ce.utexas.edu/prof/maidment/slide.html .

From all of us at KISTERS we wish you, your family and friends a very happy and peaceful Christmas and New Year.

Bill Steen
General Manager

KISTERS Pty Ltd

KISTERS AG Receives ISO 27001 Security Accreditation

Ralph Freude (left), Head of Business Line at TÜV Rheinland, hands over the certificate to Klaus Kisters (right), CEO of KISTERS AG.

The KISTERS KiCloud Services division in Aachen has recently been certified to meet the ISO/IEC 27001 Information Security standard and meet BSI TR-031-0-6 requirements for the secure operation of Smart Metering systems. CEO Klaus Kisters noted "This represents an important step towards the future for us, because the security of the IT infrastructure and IT processes are not only a priority for us, they are also at the top of the agenda for numerous companies and authorities, i.e. our customers ". Certification significantly simplifies the use of KiCloud systems or services associated with critical infrastructure systems.

One topic is increasingly coming into focus across all industries: Software as a Service (SaaS). KISTERS as an IT service provider takes care of the safe operation of the software. This means that the users can concentrate entirely on their core competencies and do not need any IT specialists themselves to take care of security concerns as well as the maintenance and care of the software. This in turn implies that the investment costs are lower.

The scope of ISO 27001 and BSI TR-03109-6 audits includes all services that Aachen provides in the areas of data and content services, application service providing (ASP), platform as a service (PaaS) and software as a service (SaaS), and software as a service (SaaS) for smart meter gateway solutions in accordance with BSI TR-03109-6. All aspects of KiCloud Services are included, from the technical infrastructure to the operational processes to the personnel.

KISTERS User Group Meetings

KISTERS Australia User Conference 2017 in Canberra

The 2017 User Conference was held in Canberra over Sep 13 and 14. Thanks to all the presenters and attendees who made it a successful and stimulating gathering.

The Powerpoint presentations and Camtasia videos of the event are available on the KISTERS Australia web site at http://kisters.com.au/user_groups_aus2017.html . To access the presentations you will need a username/password for KISTERS Clients which you can obtain from support@kisters.com.au

The list of presentations includes:

- Introduction - Bill Steen - KISTERS
- Hydromaster and Big Data - Chris Michl and Peter Heweston - KISTERS
- KiEco - A new approach to ecological data management - Vicky Isaac - KISTERS
- IFDs, AEPs and other TLAs - Janice Green - BOM
- Data Interchange and Delivery - Peter Heweston - KISTERS
- BOM WISKI and KIWIS case studies Data integration and visualisation - Todd, Joanna and Nathan - BOM
- Computer Industry Trends - Peter Heweston - KISTERS
- Hydstra in Africa - Gina Gaspar - KISTERS
- Web Dashboard Project - John West and Kevin Loh - SEQ Water
- KISTERS Web Dashboards - Chris and Denby - KISTERS
- What's New in Hydstra V12 - Peter Heweston - KISTERS
- Hydstra Web Whats new - Denby Angus - KISTERS
- Dam Safety and Hydstra - Peter Heweston - KISTERS
- Network Monitoring and Business Reporting - Peter Heweston - KISTERS
- The Drivers for HYNRS - John Hayes
- Monitoring the Regional Water Monitoring Partnership using SQL - Louise Sullivan - DELWP
- Year in Review - Dylan Evans - KNA
- Field Data Collection via Canvas - Brian Sparkes - Suwanee
- Using Hydstra ODBC - Greg Smith and Matt Correa - CWR
- Introduction to Hydstra WEB - Damian Skinner - KISTERS
- County-level Water Management - Charly Johnck - Yuba County
- WISKI Intro and Demo - Chris Michl and Markus Bauerle - KISTERS
- Whats New in KiECO and KiWQM KiEco - Vicky Isaacs - KISTERS
- KiDIP KISTERS Data Integration Platform - Markus Baurle - KISTERS
- KiWIS KISTERS Web Integration Service- Chris Michl - KISTERS
- Overview of Gemstat Project - Vicky Isaacs - KISTERS

We managed to record most of the presentations, and the list of Camtasia videos includes:

- KISTERS Australia Introduction - Bill Steen
- Hydromaster and Big Data - Chris Michl and Peter Heweston - KISTERS
- KiEco - A new approach to ecological data management - Vicky Isaac - KISTERS
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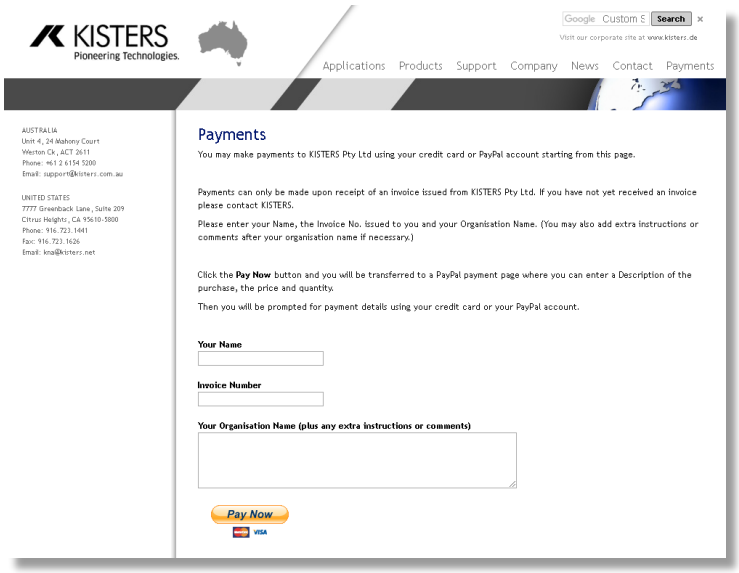
- KiWIS KISTERS Web Integration Service- Chris Michl - KISTERS
- Overview of Gemstat Project - Vicky Isaacs - KISTERS
- WISKI Field Visits - Chris Michl - KISTERS

KISTERS Pty Ltd Accepts PayPal

KISTERS Australia can now accept credit card and PayPal payments via the PayPal infrastructure. To pay a KISTERS invoice using PayPal, please go to http://kisters.com.au/payments.html and enter the payment details. You can use this payment method for any KISTERS Pty Ltd payment, including software licence fees, conference attendance, training courses, consulting projects, etc. You don't need to have a PayPal account, as you can pay by credit card.

We no longer accept cheques for any payments, please pay by direct bank transfer or PayPal only. Contact accounts@Kisters.com.au for information on bank account details. Every invoice we issue has payment details at the bottom.



Hydstra Product News

Hydstra V12 Release

Hydstra V12 has been released, and is available on the web site. We talked about V12 at the US and Australian User Group meetings, but the following points should outline some of the more important changes:

- New Delphi compiler XE6 with FireDAC Universal Data Access ibrary should mean faster access to SQL Server data
- Support for HTML, PDF, CSV and XLSX outputs from many programs, such as HYDAY and HYFLOW
- Site id extended to 20 characters everywhere
- Time-series data in a single file, no index files any more
- Multiple log offsets in rating tables for US clients
- Help documentation distributed as HTML files
- Web services support CSV returns for some calls
- Synchronising datasource for accessing data from external web APIs
- HYCANVAS framework for processing GoCanvas field data submissions
- Reporting of site-based HYGIENE failures to region or site owners
- Significant refresh of the Hydstra/WEB look and feel.
- Hundreds of individual program enhancements

It is worth noting that now Hydstra V12 has been released, support for Hydstra V10 ceases. If you are still running V10 please plan to upgrade soon. Hydstra 10.04 was released in August 2012, some five years ago, and 10.3 was released in September 2010, some seven years ago. Much has changed since then, both in our world, but more importantly in the Windows hardware and software world.

Please contact support for a V12 HYACCESS file, and plan to do an offline test upgrade first if at all possible. If you can't do a test upgrade we suggest you wait a few months before upgrading - remember the old adage about how you can tell the pioneers by the arrows in their backs.

Upgrading from Obsolete Hydstra Versions

Hydstra V9 still continues to run (just), even though it is unsupported. You may have difficulties running the HYDLL on later versions of Windows as it requires registration as an administrator, which is why we introduced HYDLLP.

A more likely problem is that when you upgrade to a 64 bit operating system many old 16 bit utilities in V9 won’t run at all.

However you can put the V9 system on a modern 64 bit Windows 10 machine, on which it won’t run, but it doesn't need to run to be upgraded to V10 and then V11.

If you are really stuck in the past you may need to start thinking about creating a 32 bit virtual machine running Windows XP to preserve your favourite legacy apps into the indefinite future.

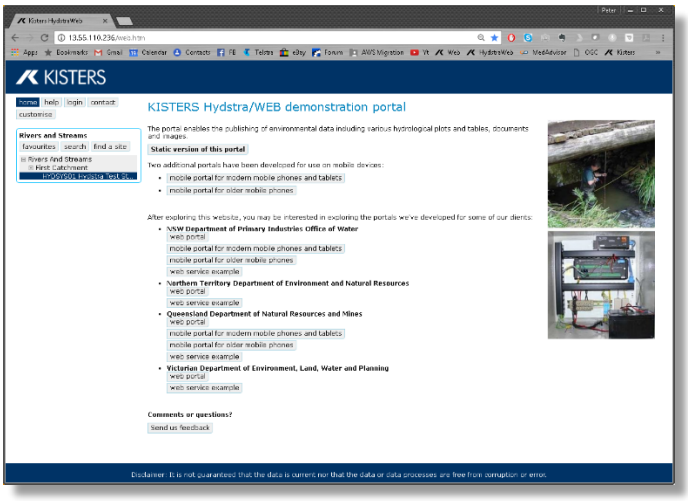
Hydstra/WEB V12 Design Refresh

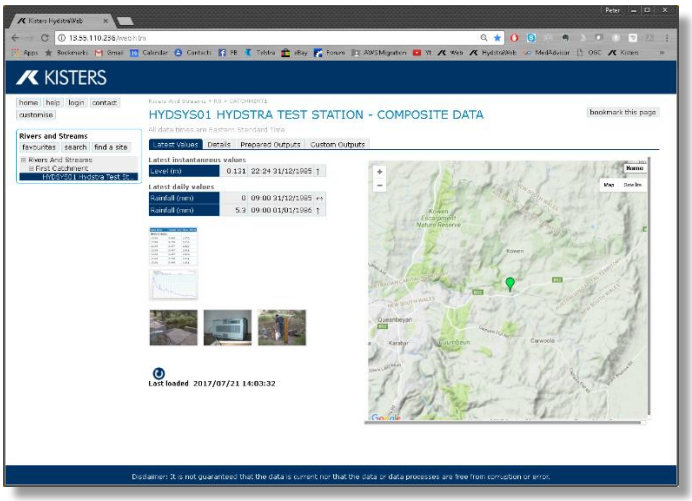
We have reworked and refreshed the design of Hydstra/WEB in V12 to produce a cleaner and more modern look. You can explore an example of the new look at http://13.55.110.236/web.htm .

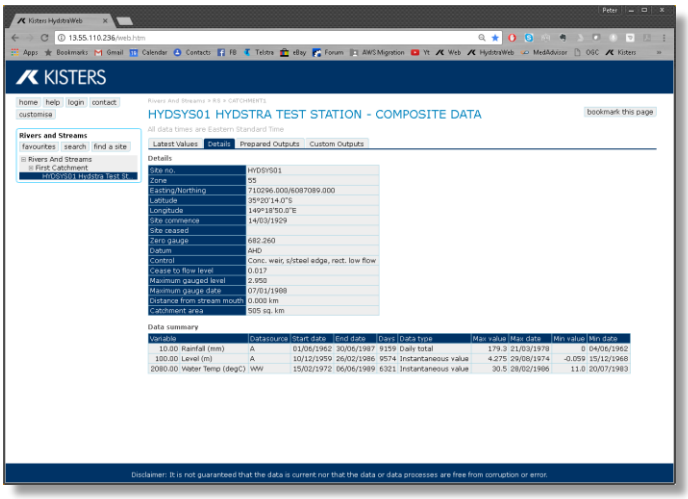
A significant approach we are exploring in V12 is the option to pre-compute most of the web content on the back-end server, which leads to a much more responsive web site at the cost of more back end server load. Both examples can be seen in action on the demo web site.

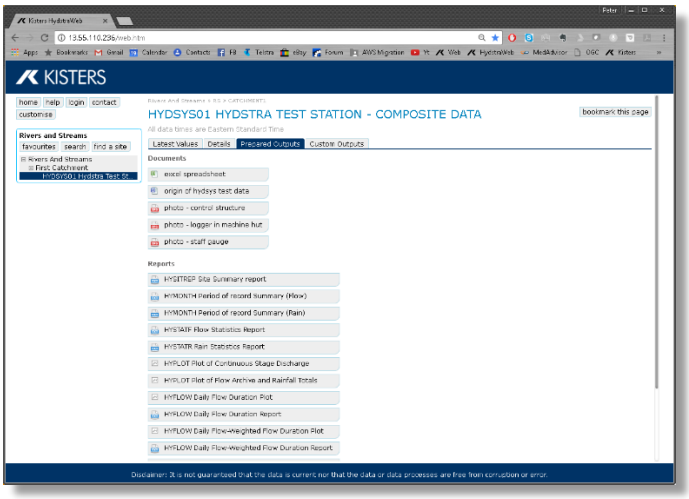
Please consult with Denby Angus about upgrading your test web server to V12 before going live with V12.

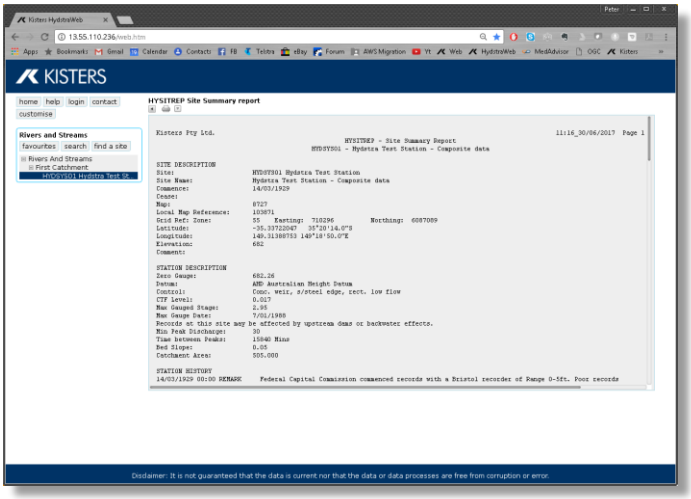
Some sample screens from the new look Hydstra/WEB site are shown below:

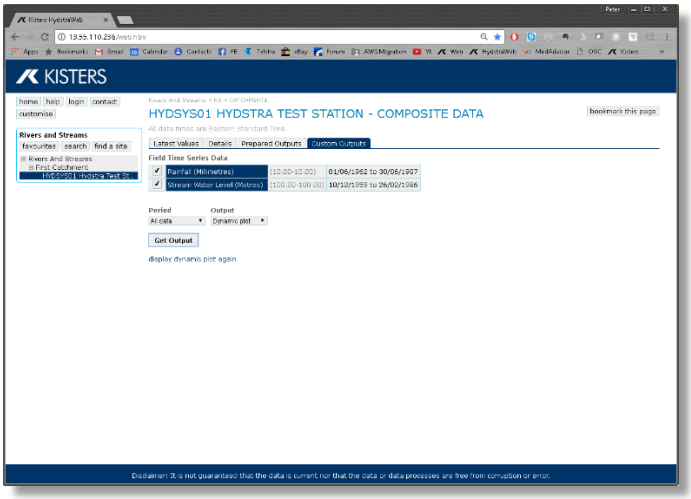








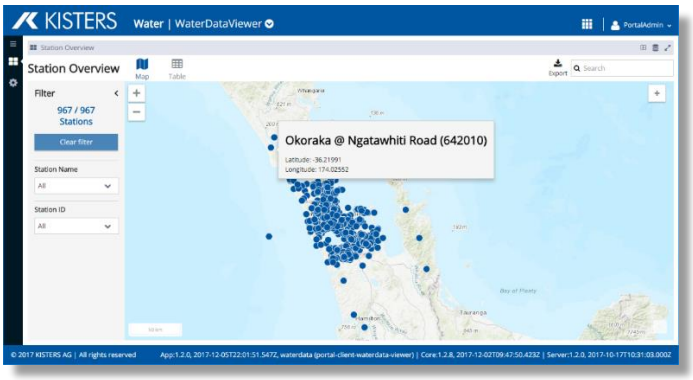


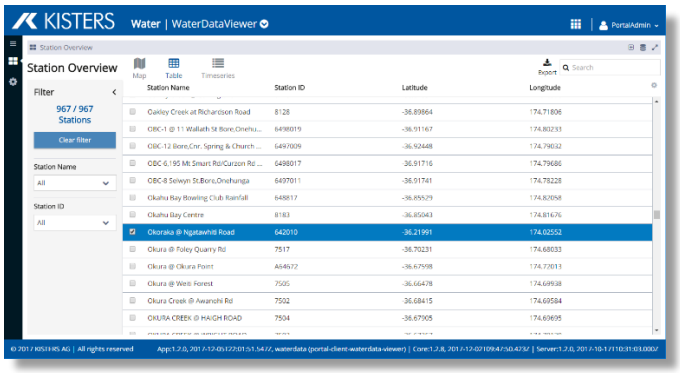


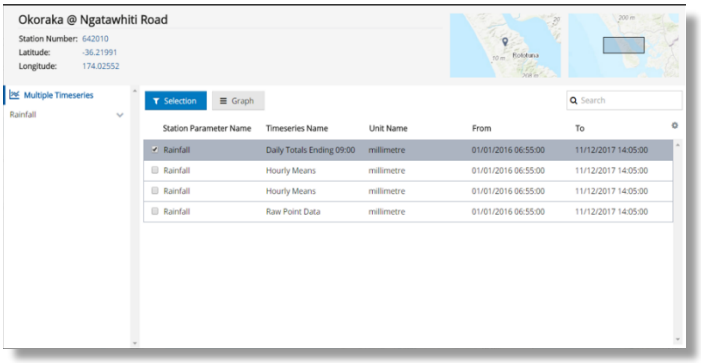
KiWebPortal over Hydstra

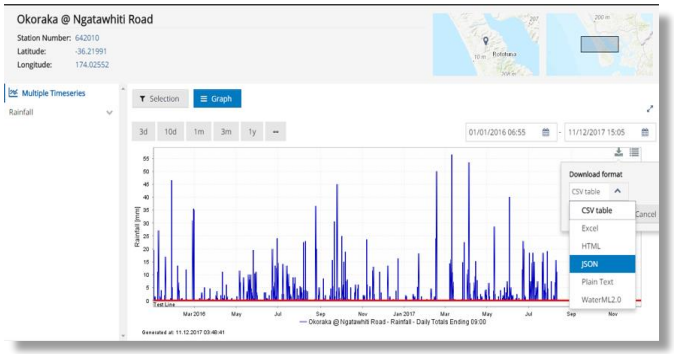
We have been working behind the scenes for some time on getting the KISTERS Portal framework to run over Hydstra, and the work is starting to come to fruition. The KISTERS Portal runs over KiWIS over Standard Hydstra over HYDLLP, and is intended to be a product-neutral web portal framework. In essence it should eventually run over any Hydstra system that publishes Web Services.

The following few images illustrate progress so far. Interestingly it can run over any Hydstra client that is publishing Standard Hydstra to the world.









Running Hydstra programs under a Windows Service - Improvements in stability and throughput

Over the past couple of years we have noticed that when running SVRRUN as a Windows service, you could not have any more than eight processes - even on a machine with 32 or more cores - without running into stability issues. Problems would generally involve processes locking up, making it necessary to stop and restart the service. Likewise, Hydstra/WEB servers and web service servers under heavy load also tended to fall apart and become unresponsive.

We recently had the opportunity to test Hydstra on a 36-core high-end Amazon EC2 machine (c4.8xlarge, SSD), and even on that machine with only 12 SVRRUN processes the system would slowly grind to a halt.

Extensive debugging showed that the problem was almost always Delphi programs falling over while starting up, specifically while creating "Windows user interface elements" (forms, buttons, text boxes and the like).

To our astonishment, we observed that running SVRRUN as a normal application in a regular desktop session, we were able to crank the number of processes up to a maximum, and it ran without any processes locking up, and way faster to boot

The frustrating and head-scratching mystery was: why would running as a servicechoke while starting these executables, while running in a normal desktop environment run faster and problem free?

After much debugging and Googling we discovered this illuminating article (warning - it's pretty heavy reading): https://blogs.msdn.microsoft.com/ntdebugging/2007/01/04/desktop-heap-overview/

The simple explanation is this: All Windows applications use something called "desktop heap memory", which is provided by the operating system. Windows allocates a generous dollop for regular interactive desktops (the sort you see when you log into a regular Windows sessions), but a much smaller amount for "non-interactive" desktops - and guess which type is used for Windows services?
Fortunately, there is a way to override this setting. You need to logon to the server, start REGEDIT as administrator, and navigate to the following key:

```
HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\Session Manager\SubSystems\
```

The keyword "Windows" will contain a value like this (it is all jammed on one line, but displayed here over several for clarity)

```
%SystemRoot%\system32\csrss.exe
ObjectDirectory=\Windows
SharedSection=1024,20480,768
Windows=On
SubSystemType=Windows
ServerDll=basesrv,1
ServerDll=winsrv:UserServerDllInitialization,3
ServerDll=sxssrv,4
ProfileControl=Off
MaxRequestProcesses=16
```

The sub-item of interest is "SharedSection=1024,20480,**768** ", which has three comma-separated values, being:

1. the shared heap size common to all desktops (and should not be changed),
2. the size of the desktop heap for each desktop that is associated with an interactive window station,
3. the size of the desktop heap for each desktop that is associated with a "non-interactive" window station.

You need to increase that third number. We found 4096 to be sufficient, so the setting reads:

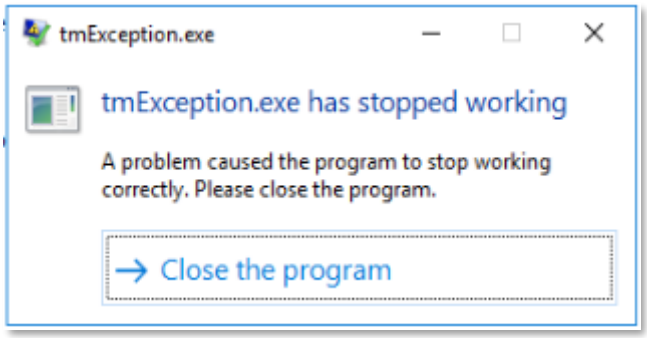
```
SharedSection=1024,20480,4096
```

A server reboot is required after changing the registry.
When we restarted the SVRRUN service with 16 processes we were immensely pleased to see that none of the processes locked up. We then enhanced SVRRUN and SVRMON, raising the maximum number of processes from 16 to 32 and on the server we were testing, the system remained stable using 32 processes. Likewise we were able to run 30 consecutive web sessions all creating plots dynamically, and without failures.

The current patch releases for v12.00 and v11.00 include SVRRUN and SVRMON versions that can handle 32 processes.

Preventing Blocking Modal Dialogs on Task Servers

An issue that occasionally bedevils high volume task servers and web servers is the annoying tendency of Microsoft Windows to pop a blocking dialog in some circumstances when a program stops working:

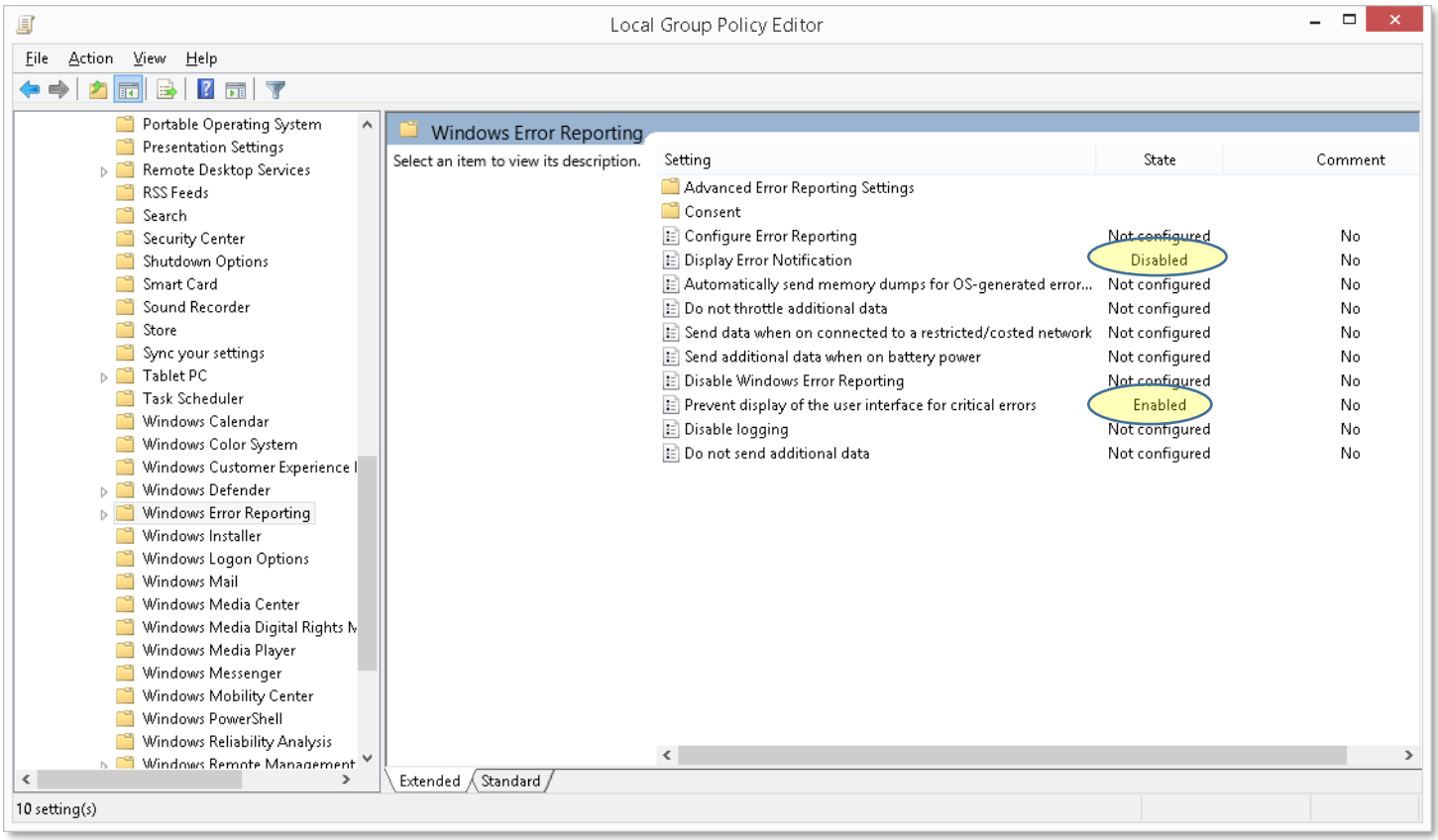


These will gradually bring any server to its knees if they accumulate.

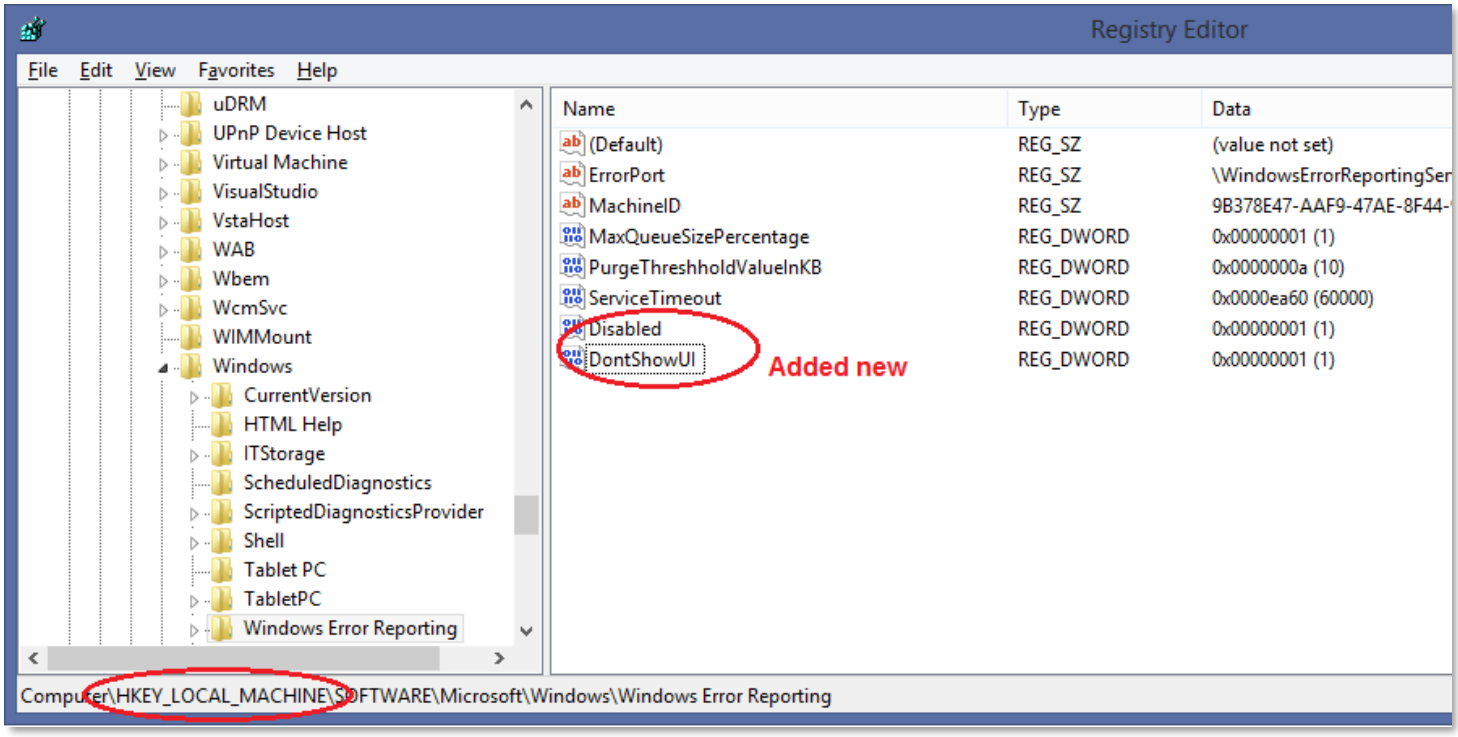
There are some settings that can disable this blocking behaviour, and they are accessed via the Group Policies editor *gpedit.msc*.

Open the Group Policy Editor by typing *gpedit.msc* into the Start search box or the Run dialog.

Navigate to Computer Configuration > Administrative Templates > Windows Components > Windows Error Reporting. Double click on “Prevent display of the user interface for critical errors” in the pane on the right. On some PCs you also need to disable *Display Error Notification* .



On some local PCs you might need to add a couple of registry entries as follows:

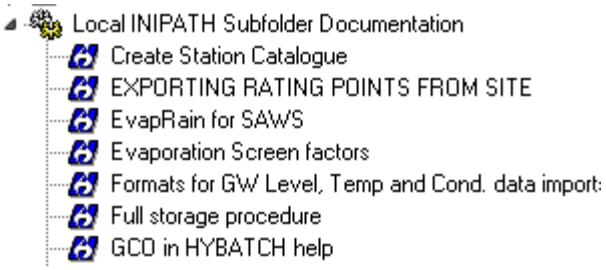


We distribute TESTEXCEPTION.EXE in RUNPATH that raises such an exception if you wish to confirm that you have suppressed the modal behaviour.

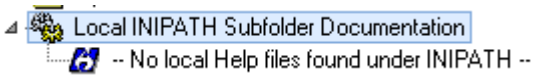
Local Help Documentation Available in V12

If you have documented local INIPATH HYSCRIPT jobs under INIPATH\overview (or *INIPATH\programs* or *INIPATH\localover* or *INIPATH\localprog*) the documentation will be shown when you press F1 on a local script.

A dynamic node *Local INIPATH Subfolder Documentation* will expand to display all local documentation files stored under *INIPATH\overview* etc as .HTM files, in alphabetic order:



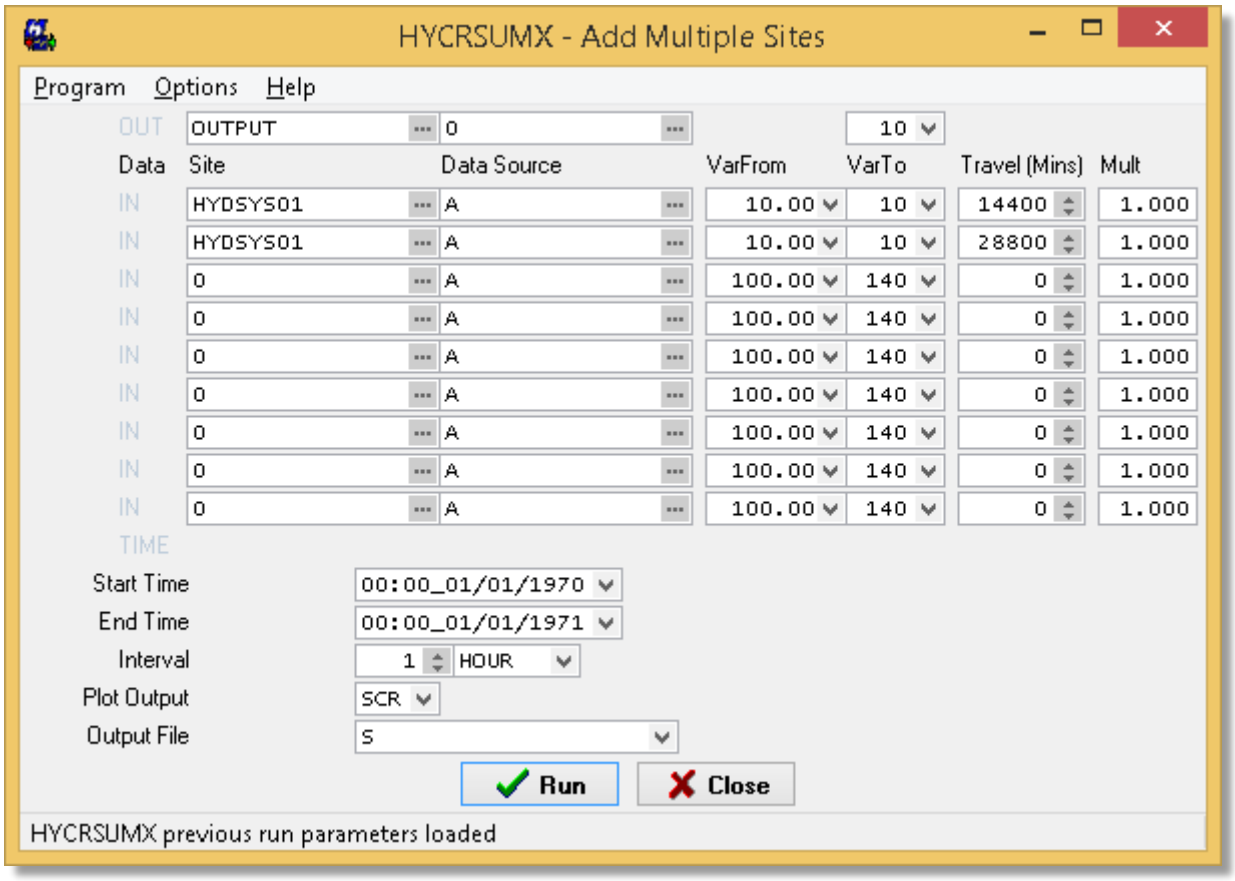
If there is no local documentation present the display will be



As a matter of principle we encourage you to keep any local Hydstra documentation you develop as HTM files under INIPATH\overview or one of the other included folders.

HYCRSUMX Adds Multiple Time Series Traces

Program HYCRSUMX is a HYSCRIPT wrapper for MODSYN that adds up to nine time-series traces, each of which can have a travel time and a factor. The program can operate on flow or rainfall, and can optionally produce a plot of all traces, output and input. HYCRSUMX requires a MODSYN licence to operate.



HYSTNS and HYDBSQL

Site lists are a powerful feature of Hydstra, and it is desirable to be able to use the results of a site list evaluation in conjunction with other SQL statements in HYDBSQL.

We now provide a special structured comment in HYDBSQL that evaluates a HYSTNS expression:

```
--sitelist=table(rateper)
```

which will evaluate the site list and put the results in [PRIV.HYDBSQL]SITELIST, from where it can be accessed in SQL. Note that the site list is evaluated before the select statement, regardless of where it is placed.

If you wish to override the default work area you can specify it in another structured comment

```
--sitelistarea=[PRIV.MYLIST]SITELIST
```

You must include the table name SITELIST in the specification.

Because specifying the exact table name for a site list gets complex we provide a special macro *&v-sitelist.* which contains the name of the SITELIST work area, and which can be used in select statements:

```
select S.STATION,S.STNAME from SITE as S,
&v-sitelist. as W
where W.STATION=S.STATION
--sitelist=table(rateper)
--head=Sites with Ratings
--head=Work area &v-sitelist.
```

This code will run correctly under SQL Server and Foxpro without change.

New HYXL2BOM Standalone runs without Excel and on 64-bit systems

We have delivered a new standalone version of HYXL2BOM to the BOM which runs on computers without Excel installed, and on 64 bit systems. It also runs under terminal server systems.

Please contact the BOM for an upgrade.

HYQUICKWEB Can No Longer Use Dropbox as a Free Web Site

As of September 1 Dropbox have withdrawn the facility for public folders to be used as a simple free web site. We have updated the HYQUICKWEB code and documentation to reflect this fact, and outlined how to create a web site from a simple HYBATCH job in one step. You will need to use your own corporate web site or acquire a web site from one of the many cheap providers out there. You can see an example of HYQUICKWEB in operation at https://kisters.com.au/hyquickweb/map.htm . The revised HYQUICKWEB has been patched back to V12 but not V11.

GDN Synchronising Datasource

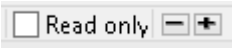
HyQuest New Zealand operate a global data collection system called GDN based on a hosted version of Hydrotel. For a few dollars a month HyQuest will provide you with a SIM card that will work anywhere in the world (more or less) to collect data from any Hydrotel supported logger. The system is ideally suited to small users with a handful of sites who don't want to set up their own telemetry infrastructure.

In conjunction with HyQuest we have developed a plugin for the Hydstra synchronising datasource which allows GDN users to easily download their data into Hydstra on demand by running HYSYNCTS. You will need a recent patch of Hydstra V11 or V12 - if you have *hydatasrc_sync_gdn.pm* in MISCPATH then you have the driver. Read the documentation on the Synchronising Datasource for details on how to set up and configure the GDN datasource.

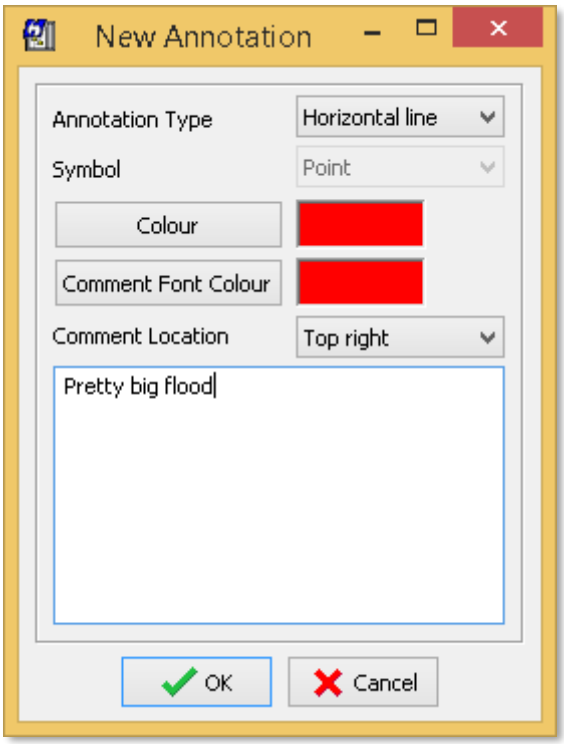
For more information on GDN and enabling the web service which allows Hydstra to collect the data automatically please contact HyQuest New Zealand at sales@hyquestsolutions.co.nz.

Manually Annotating Hydstra Plots

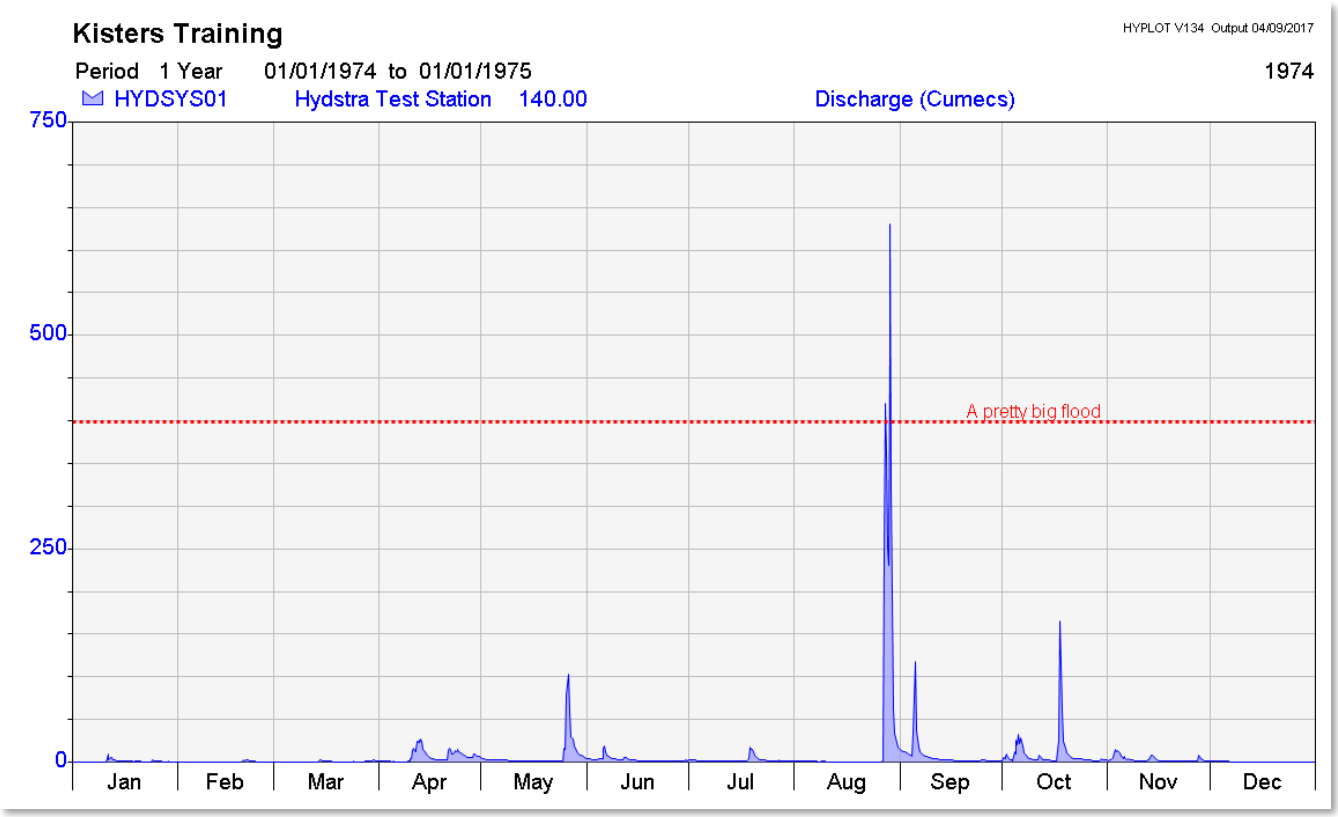
A little known facility of the WIP system is the ability to manually annotate a plot with either horizontal or vertical lines and labels. To add an annotation to a plot, clear the read only checkbox in the lower right of HYXPLORE:



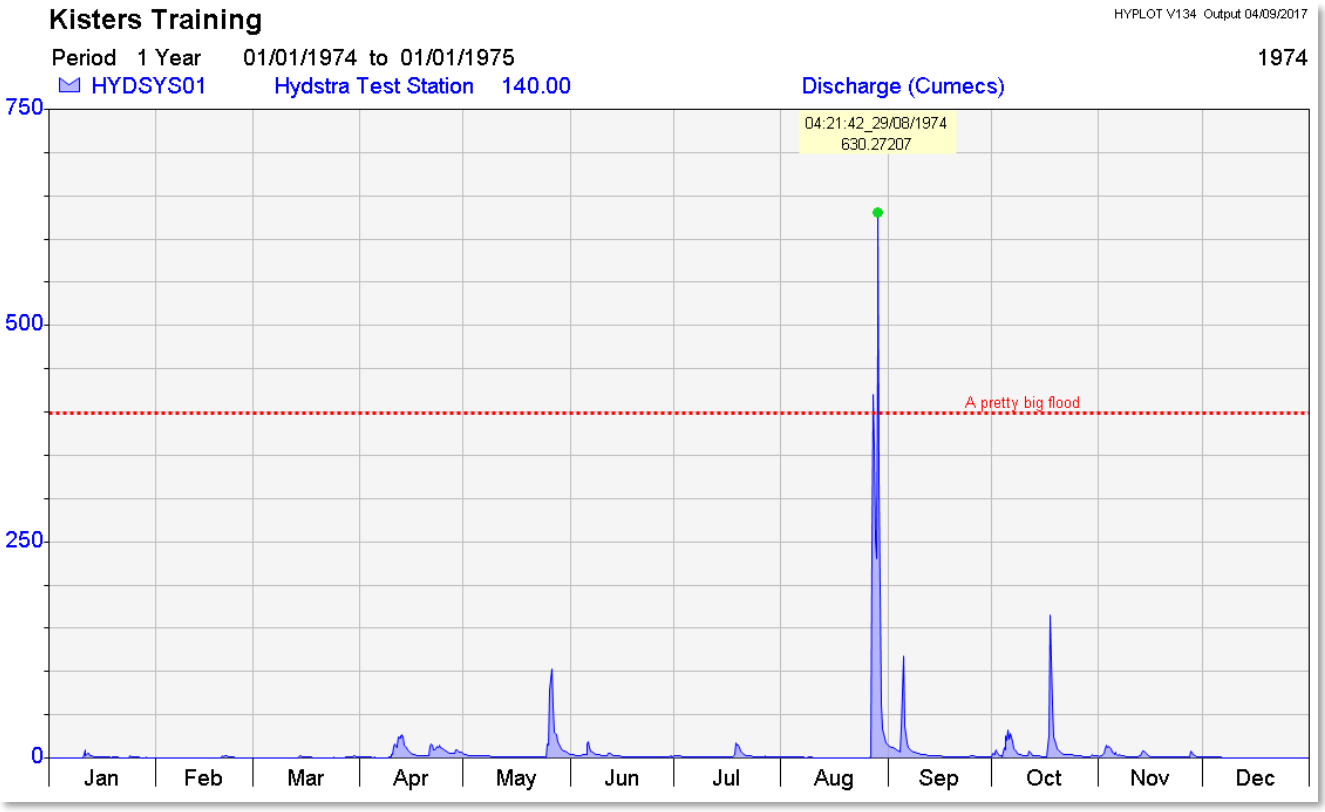
Now right click anywhere on the plot and choose *Add Annotation*. A dialog pops up offering a horizontal or vertical line and some text. You can tailor the colours and styles to your taste:



The corresponding line will be written at the mouse position, either vertically or horizontally as you prefer:



Alternatively you can hover over a point, right click, and *Add Point Details*, in which case the point is highlighted and the time and value are embedded above it:



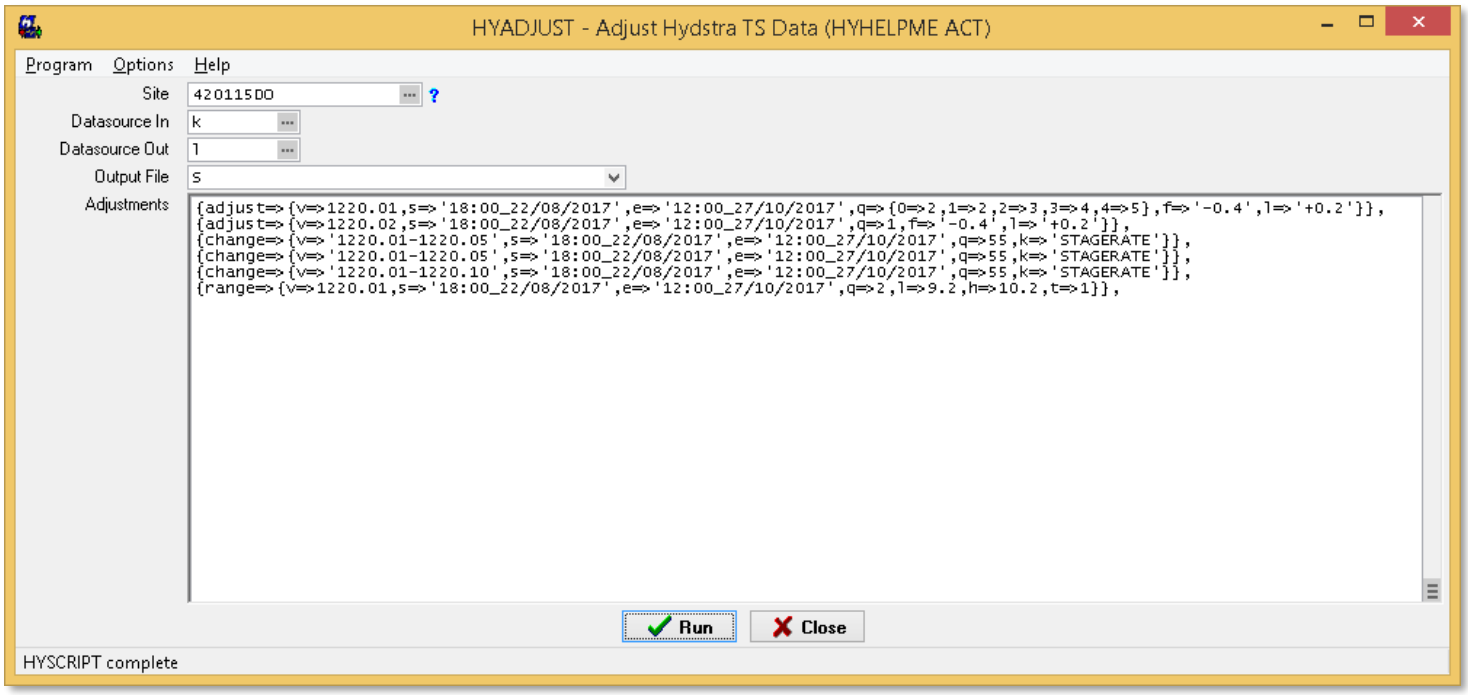
Of course to algorithmically produce a horizontal line you would use a datasource of some sort - CONST, STNINI, time-table or whatever.

More on Hydstra over SAN

In March we advised you not to run Hydstra over a SAN or NAS. It seems we were a tad hasty in issuing the blanket warning as many SAN devices perform really well - witness the amazing performance you get in the Amazon cloud where everything is virtual and networked. Perhaps a better message is - if you start seeing C0000006 exceptions then by definition your network is not keeping up, and moving the Hydstra system files to a faster device will make the problem go away.

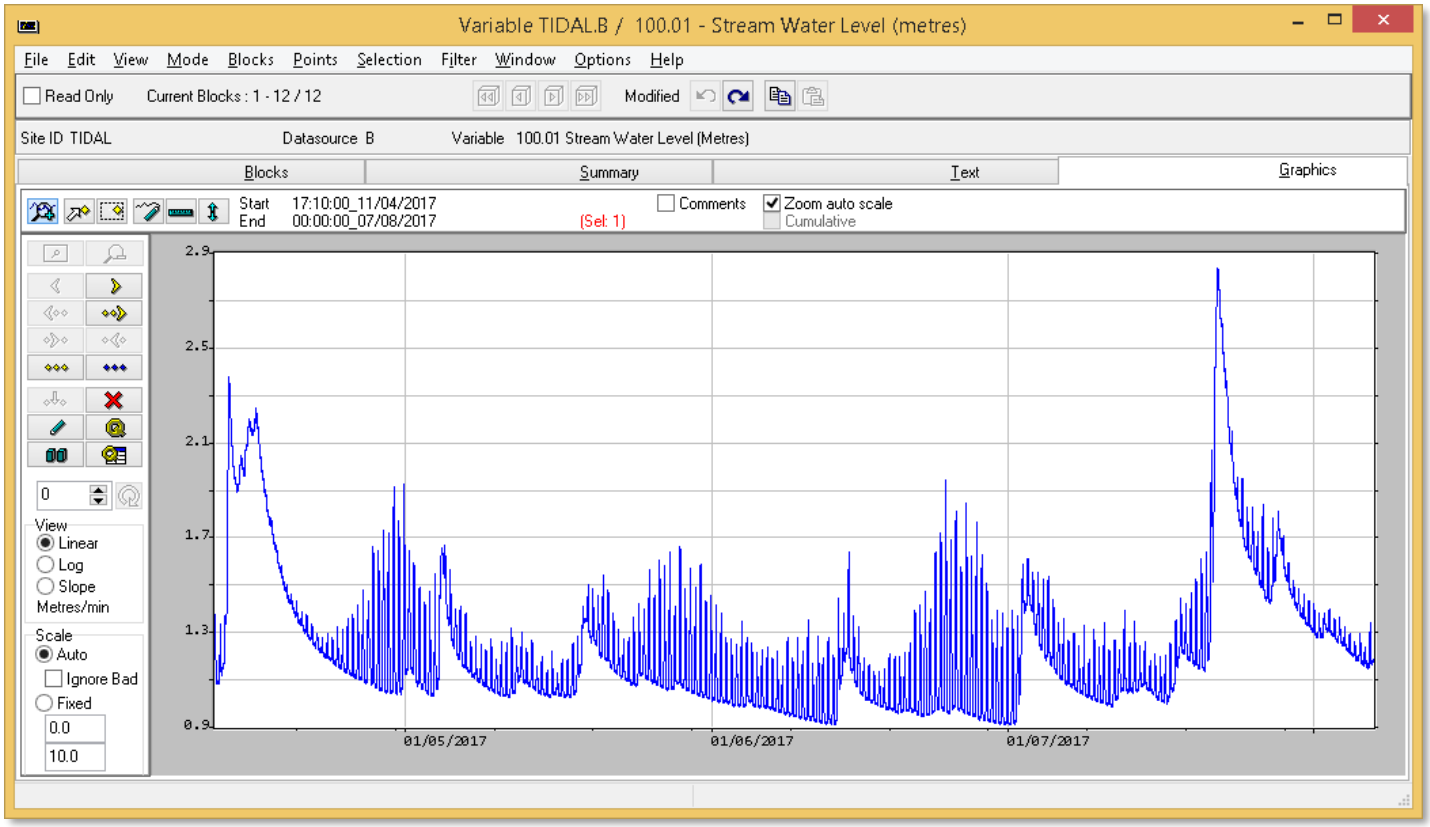
HYADJUST - Batch adjustments to time-series data

We have released a new program HYADJUST which applies batch changes to time-series. It can apply calibrations, fill gaps, change quality codes and more. Be aware that HYADJUST is still under active development in response to user feedback, so behaviours may change. HYADJUST is available in V12.

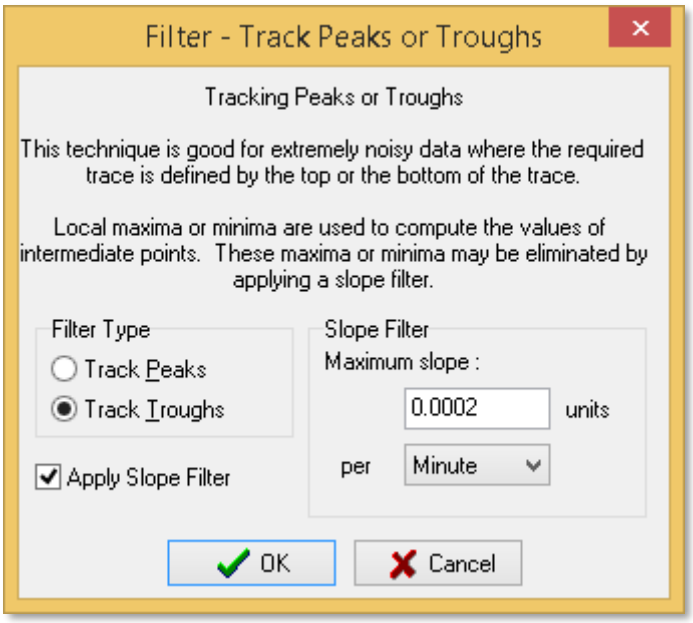


De-tiding River Data in the Workbench

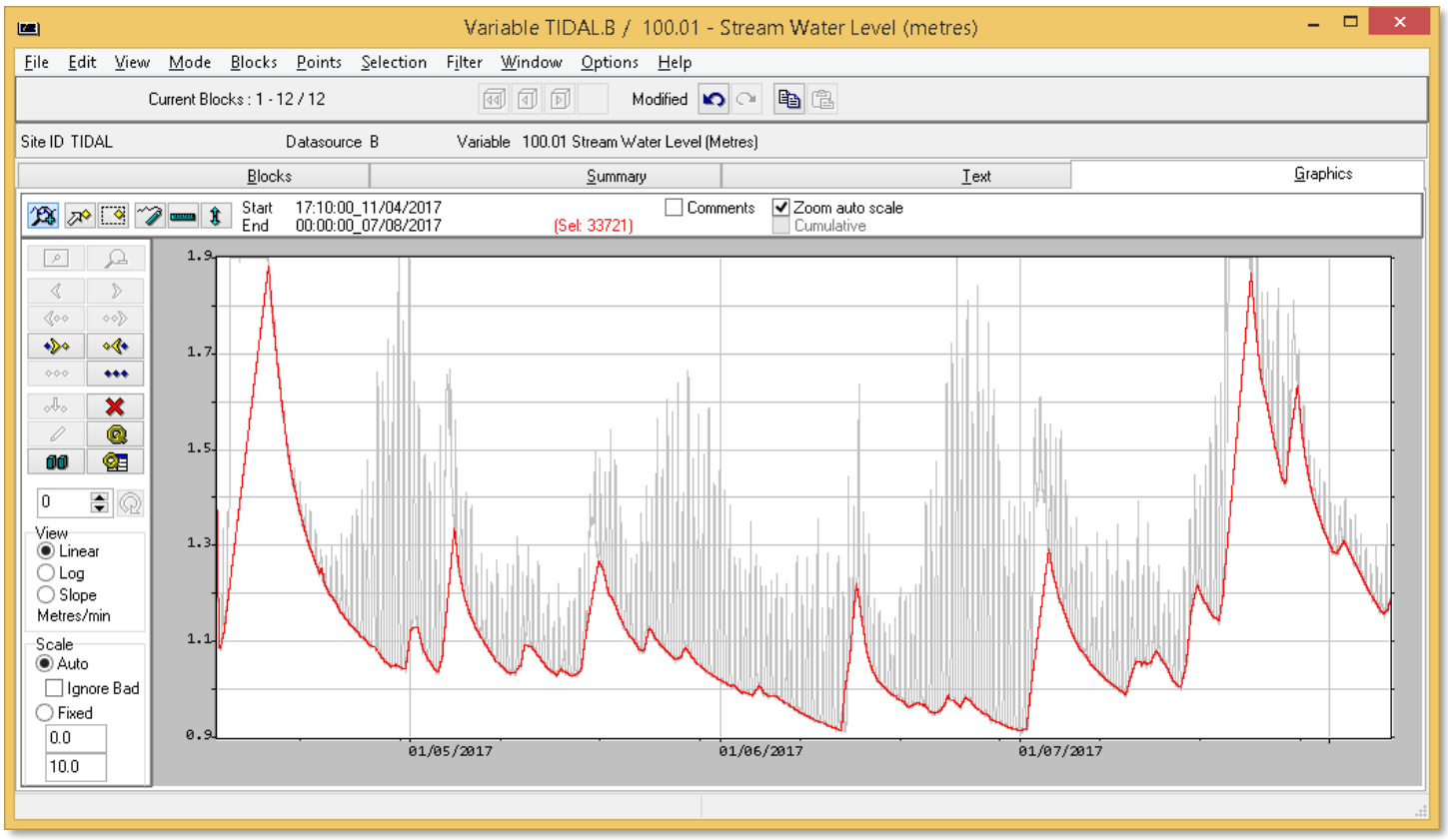
We recently had a client inquire about removing tidal influence from a water level trace close to the sea. The original data looks like this:



We loaded the data into the Workbench and applied an 11 point 3 pass moving mean over the data to remove the low level jitter in the trace, then applied Filter/Track Peaks or Troughs with parameters derived by trial and error:



The resulting trace is a pretty fair representation of the trace with tidal influence removed. A little bit of manual editing could be applied to further clean up the result if necessary.



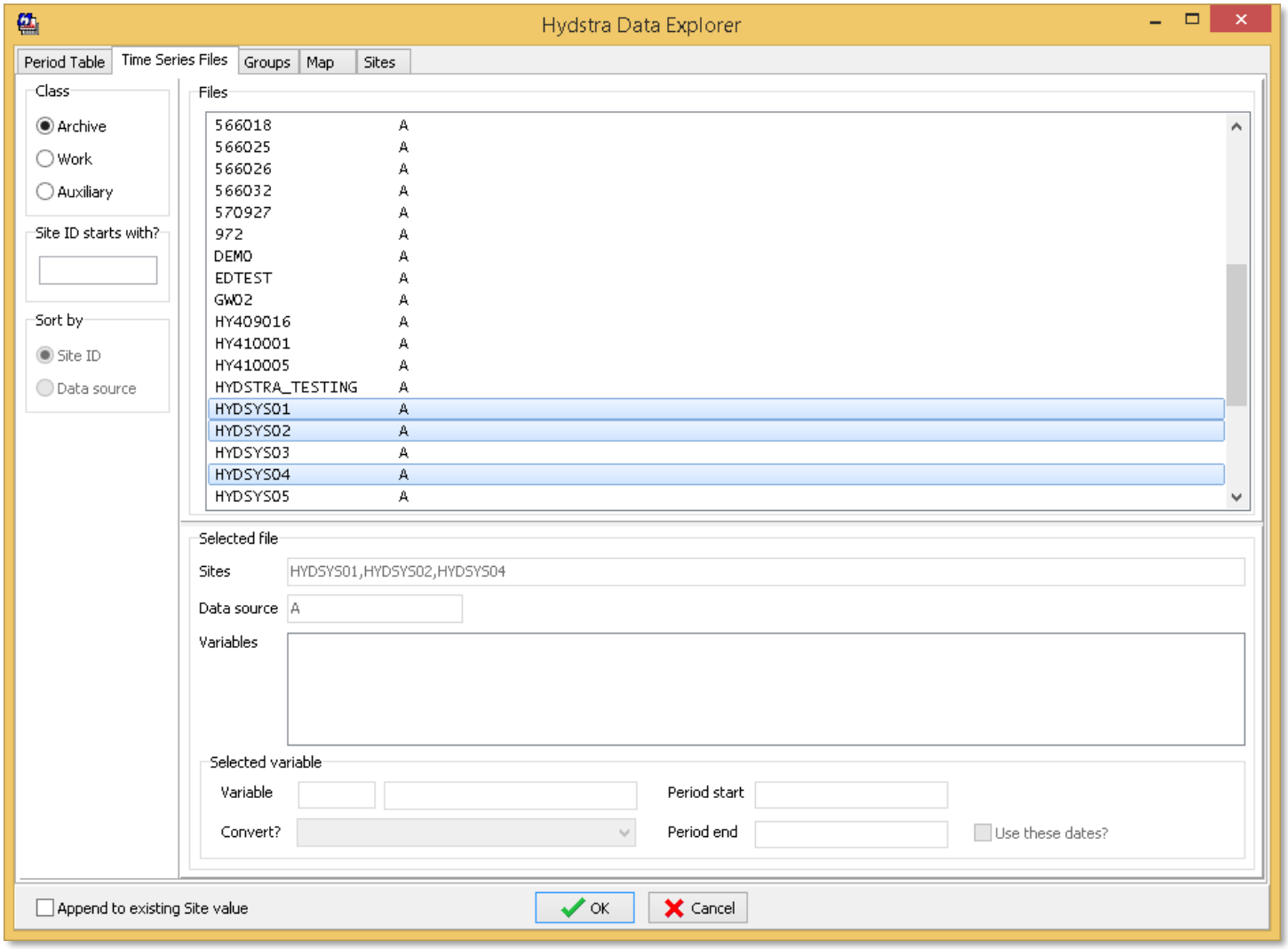
SVRIMP has an option to update the PERIOD table (V11 and V12)

A new optional feature UpdatePeriodTable=yes means SVRIMP can now update records in the PERIOD table, meaning you may not need to use SVRTRIG triggers to get SVRRUN to run HYPERUPD. This can result in some significant performance improvements. There are however some important limitations:

- As this means SVRIMP holds the PERIOD table open pretty much all the time, we only recommended you enable this feature over a SQL Server database. Having the database open all the time in FoxPro may interfere with other users of the system.
- The update feature is similar to HYPERUPD's "Fast mode", in that we don't update any data-related column, just the period end date/time.
- Likewise, SVRIMP will only update existing records in the PERIOD table, it won't create new ones (or delete anything).

Data Explorer – multi-select now available in the Period and TS Files tabs (V12 only)

Multiple site selection is now available in all the tabs of the Data Explorer dialog (available via F2 or the "…" button on parameter screen apps, and also used in other places like the Data Managers' Workbench File|Open.



New HYRATED Feature: Labelled Heights (V11 and V12)

This allows you to specify a series of heights (different for each site) and display them on the main rating display with a label. For example, spillway levels, historic floods, median-flow height etc.

To set this up, you need to define some STNINI keywords, then enter data into the STNINI table. Each STNINI entry must be a single value.

In the HYRATED Options dialog, you can then nominate these STNINI keywords, and specify the colour and label to use when displaying them. The format for each entry is:

```
STNINI-KEYWORD=colour,label
```

Colour can be any colour defined in HYCOLOUR.INI, or a hex RGB code (note order: $*BBGGRR*). See the Windows Colours documentation for a selection of colours to choose from.

Label is the text that will be displayed with the line plotted at the value from STNINI.

Collation Sequences in SQL Server

For compatibility reasons, Hydstra uses a SQL Server collation sequence of *SQL_Latin1_General_CP850_BIN*, which is different to the collation used by other databases, which is often *SQL_Latin1_General_CP1_CI_AS* or *Latin1_General_CP1_CI_AS*. We need to use *SQL_Latin1_General_CP850_BIN* in Hydstra to ensure that SQL Server and FoxPro collations match - very important when we are potentially sorting on special characters in tables such as PRINTQUAL.

If you need to connect a Hydstra table to another database with a different collation sequence you need to specify in the SELECT statement which collation to use, e.g.

```
use hydstra
SELECT vRWMP_TSCurrentParams.BS_Site, vRWMP_TSCurrentParams.HYDSTRA_VAR_NUM,
  vRWMP_TSCurrentParams.BS_Variable,
  vRWMP_TSCurrentParams.BS_end
FROM vRWMP_TSCurrentParams
LEFT OUTER JOIN
hydstra_prod_archive.dbo.PERIOD ON vRWMP_TSCurrentParams.HYDSTRA_VAR_NUM = PERIOD.VARIABLE AND
vRWMP_TSCurrentParams.BS_Site = PERIOD.STATION
COLLATE Latin1_General_CI_AS
where PERIOD.DATASOURCE is null
order by vRWMP_TSCurrentParams.BS_Site
```

Look at https://docs.microsoft.com/en-us/sql/t-sql/statements/collations for a nice example of how changing the collation sequence dramatically changes the ordering of returned data.

Acres and Acres of Fun

For those interested in the minutae of units and unit conversions you may be amused to learn that there are acres and there are acres. The acre is an obsolete unit of measure, but still used in some countries. According to our bible, *Scientific Unit Conversion* by Francois Cardarelli, the British or International acre (unitcode ACRE) is 4046.8564224 square metres whereas the US Survey acre (unitcode ACRU) is 4046.872610 square metres. The difference is infinitesimal (0.0004% or approximately the size of a postcard). We will ignore for the purposes of this discussion the equally obsolete Irish acre (6527.87778 square metres), the Plantation acre (5188.277465 square metres) and the Scottish acre (4935.190759 square metres), all of which are very different again.

It is likely that any conversions in Hydstra are using the British acre unless you have gone to some trouble. We have carried through the unit code distinction through acre-foot (ACFT and ACFU) but not necessarily through all the rest (acre foot per day ACFD is based on the British acre for example).

If you really know which acre you are using, and you really care, come back to us and we can push the US acre through to other related unitcodes. Send us a postcard.

Blank values in key fields under SQL Server

Over recent weeks we have encountered some intractable problems dealing with blank values in key fields of database tables under SQL Server. These cause technical problems deep down in the SQL drivers, though they've never been a problem with FoxPro tables, so many users will have examples in their archives (e.g. BOTTLE in SAMPLES and RESULTS). After a couple of false starts, we have amended our handling of blanks in key fields.

The typical situation that causes this is a combination of three factors:

- the field is a key field
- the field is coded (validated against a code group)
- that code group contains a blank entry (typically "unknown", or "default")

The most likely place where problems will pop up is when editing key fields under SQL Server. After attempting to save your changes, you see a message like this:

```
HYMANAGE could not position table LITHDRIL at record 71000072,1,DRIL,8.
If you have moved the record outside the current scope, this is to be expected.
```

After clicking OK, your changes are discarded.

What we've done:

When you modify a record in HYMANAGE under SQL Server, we now perform a quick check for blank key values.

If there are any, all the key fields will be disabled for editing. A message about this will be displayed on the bottom of the HYMANAGE screen while you are in edit mode.

To edit the key fields of such a record, you will need to COPY it to the new key, and delete the original.

Note: FoxPro database users will see no changes at all

For the future:

We believe that the key-field editing problem is the most serious problem we have with blank key values, however we can't guarantee this. We would recommend that you have a look at any places where you have blank key values, and consider changing them. This will not be possible in some cases, for example CODES.CODE - there are plenty of cases where a blank coded value is appropriate, and that means we need to store it in CODES - which then becomes an example of the problem!

"User data" tables with blank key fields that we know about:

- SAMPLES.BOTTLE
- RESULTS.BOTTLE
- LITHDRIL.INTERPRET

Other examples (system tables, KISTERS-maintained tables)

- CODES.CODE
- QUALCODE.PRINTCHAR.
- MESSAGES.LANGUAGE

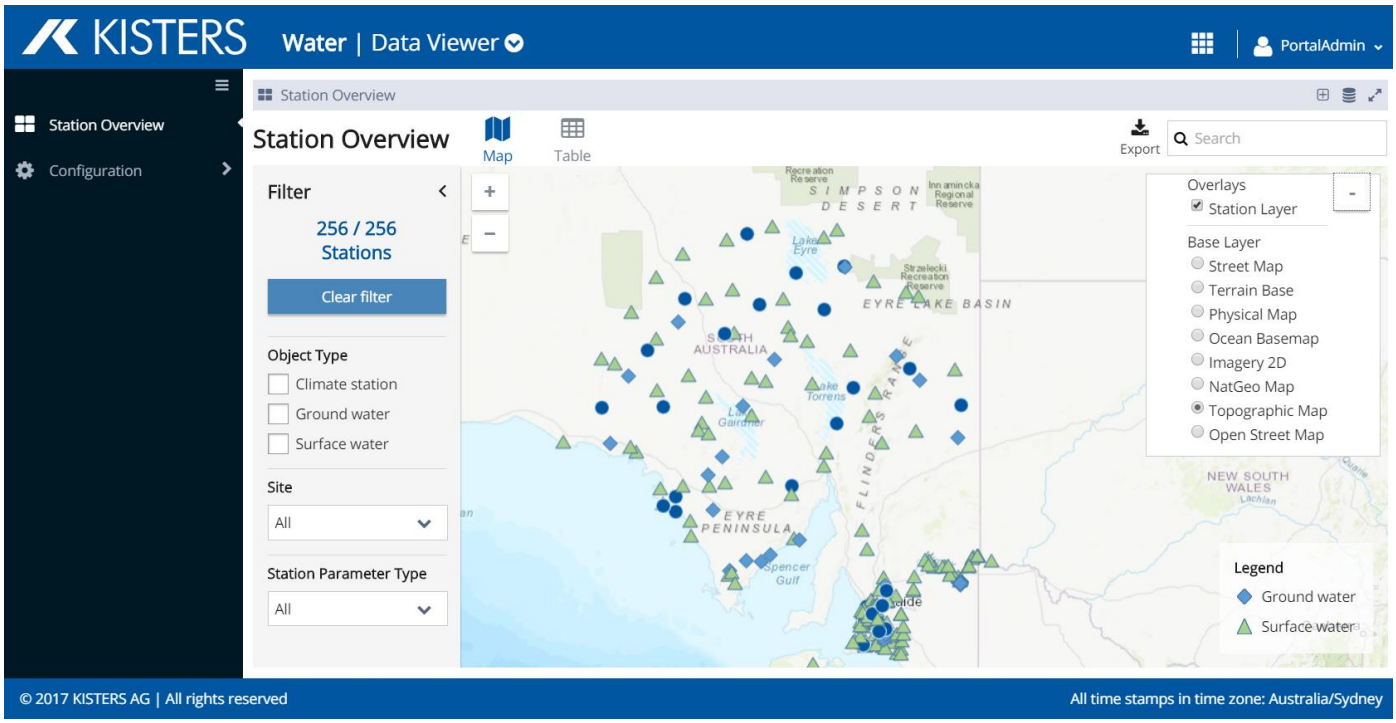
WISKI Product News

Release Management and Client Base

The KISTERS team in Australia finished testing the 7.4.7 WISKI version which especially brings many further functional developments for the water ecology package KiEco and performance improvements for WISKI server. The version will also include two Water Portal applications for basic time series viewing and application metrics. Both applications were presented at the user group (see two screen shots below):

Application Metrics:

Data Viewer:



The team will organise and discuss with all clients the update options in the new year.

In 2017 KISTERS Australia had a high interest in the ecological data base KiEco and the Water Portal developments. A number of councils in NZ have installed KiEco to replace the existing Ecobase system. This development and the migration from Ecobase and other data sources to KiEco will be ongoing in 2018. The discussion of these projects with ecology experts showed that worldwide there is nothing like KiEco available to the water community.

The KISTERS water portal has been gaining more and more interest from our users in 2017. One outcome of this development was a project with Seqwater utilising a customised water portal tailored for dam operation and management. A second project involved a proof of concept for Yarra Valley Water integrating different data streams from SCADA, GIS and operational data for an intelligent alarming portal application.

With the Water Portal development the KISTERS KiWIS solution is coming more and more into focus building the interface to connecting data from WISKI and Hydstra to web, mobile and third party systems. The KiWIS concept was introduced in the last newsletter.

The following describes as an example the migration of the ecological data from Ecobase to KiEco and the data analytics and dashboard developments achieved in the PoC with Yarra Valley Water.

The SEQ project will get attention in the next newsletter once feed-back from the operators and management can be included and evaluated.

Case Study: Legacy biological database migration at Auckland Regional Council, NZ

Background

Auckland Regional Council, New Zealand's largest local council, are tasked with undertaking many and varied biological and habitat surveys, in both terrestrial and aquatic environments, for the purposes of environmental monitoring and reporting. It is also responsible for managing data from community based data collection programmes. In the past this data was stored in a number of different formats and locations, making it difficult and time consuming to undertake standard querying and reporting. The main repository, Ecobase, was also being phased out so in 2016 a project began to migrate this data into KISTERS' new ecological data management system, KiEco, and to consolidate data from other sources at the same time.

The three main challenges that normally arise when attempting to store and manage biological survey data are:

1. The variety in the type of data (i.e. data captured for each survey type can be different)
2. The variety in the structure of the sampling/observation locations (i.e. in order to obtain unbiased and representative sample, each sampling methodology can be designed differently)
3. The complexity of taxonomic data

Auckland's biological and habitat assessment datasets were also many and varied and included the following:

- Marine ecology
- Freshwater ecology
- Community shellfish ecology
- Rocky reef ecology
- Estuaries
- Regional discharge
- Wetland biodiversity
- Forest biodiversity
- Riparian extent
- Stream ecological valuation

KiEco provides the flexibility to allow any manner of biological and habitat survey data to be stored based on different user defined 'types' which allow the customer to configure the system as they require without the need to further programming or database changes. It also allows the customer to design a locational hierarchy that can match their specific sampling methodology for a given environmental monitoring program.

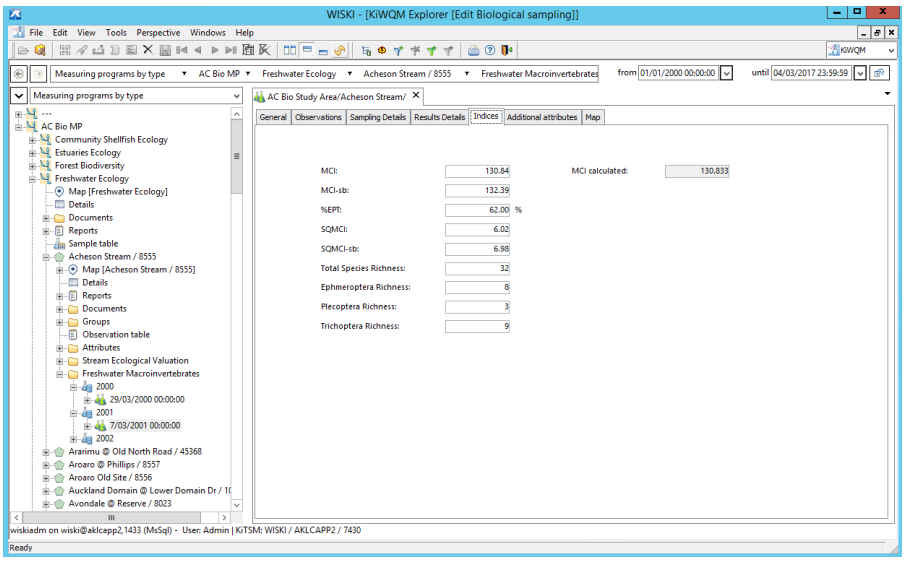
Project delivery

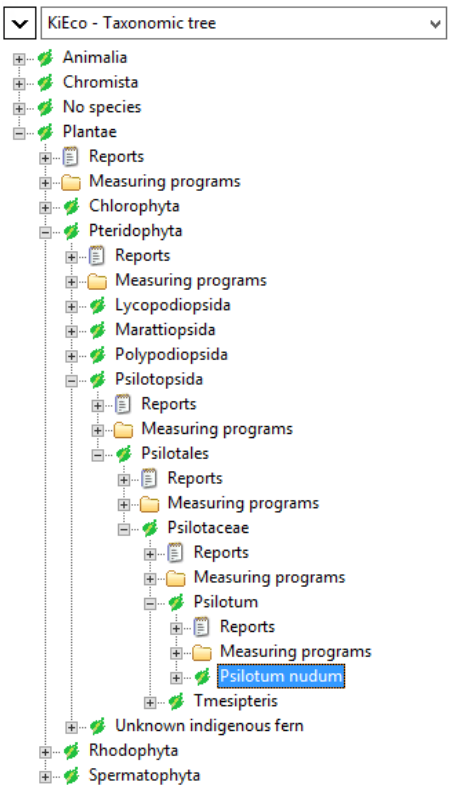
An initial introduction phase began in late 2016 which included remote presentations and demonstrations to introduce terminology, constructs and outline of data structure decisions. Auckland were also given access to a cloud based demo system with which to get to know the system better before entering into the next phase of the project.

A configuration phase began in Feb 2017 which included a number of face to face workshops and system installation and initial configuration on Auckland's hosted cloud servers. An initial system structure and design was specified and example data based on that design loaded into their system.

The migration phase began in April 2017 which first involved finalisation of all types, attributes, layouts and structures. Import configurations were setup for the different data types and data extract routines were written to extract Ecobase data according to the rules of the design specifications and import templates. This phase also saw the configuration and import of Auckland's taxonomic tree. All sampling areas (i.e. locations) were imported (approximately 1000 split into 6 different types) as well as all the associated samplings, observational and measurement data (approximately 2 million observations split 12 different types)

The final phase in July 2017 saw Auckland undertake a final review of all migrated datasets and KISTERS provide on-site training for all data managers. The system now has successfully been in operation since that time and data managers are now fully equipped to configure the system as required to continue to meet future needs. In addition a system enhancement now provides for the automatic calculation of a standardised biological index, the Macroinvertebrate Community Index (MCI), that represents ecological freshwater quality of a stream based on the macroinvertebrates that are found there.



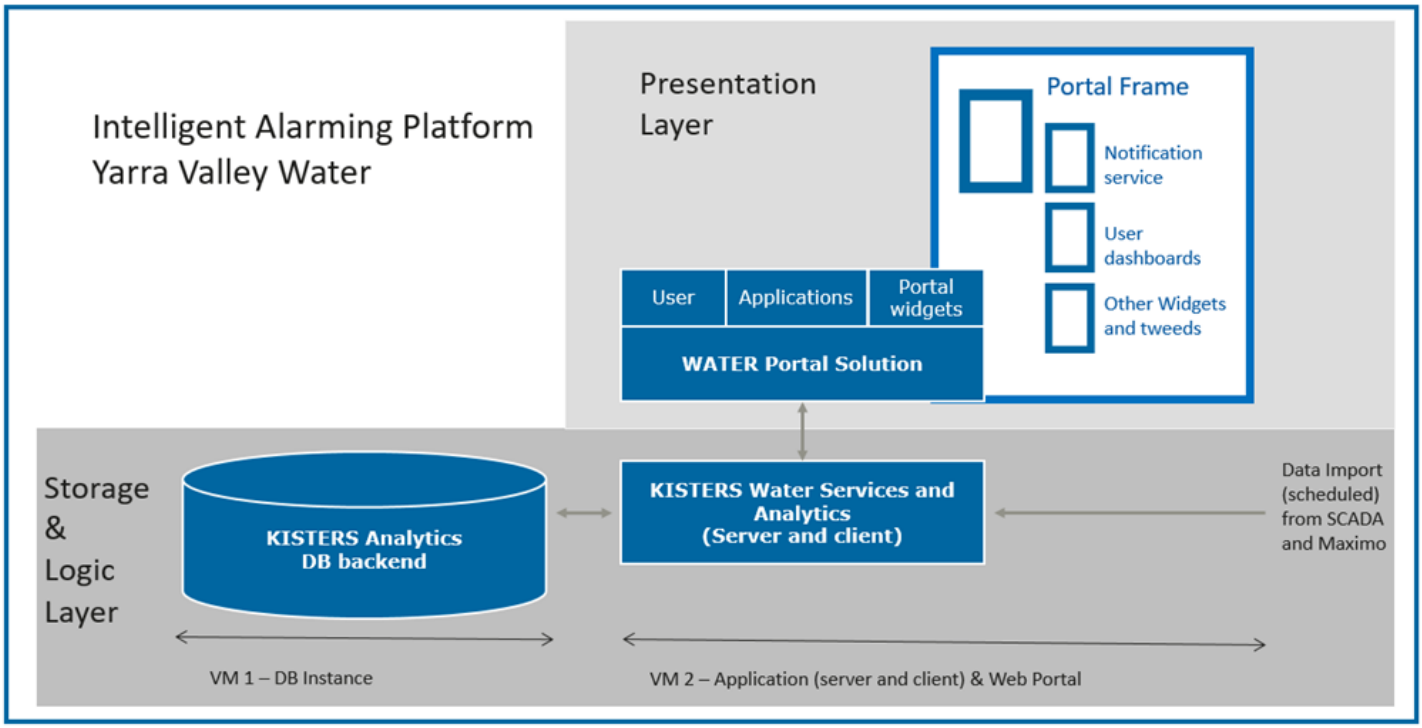


Case Study: Intelligent alarming within a sewer network – Proof of concept for Yarra Valley Water

KISTERS carried out in 2017 a proof-of–concept (PoC) for Yarra Valley Water to evaluate and optimise alarming conditions within a sewer network. Using historical and real-time data taken from the utilities SCADA, EAM, GIS and the Department of Meteorology (BOM) data the PoC evaluated the accuracy of predicted alarms. The WISKI software with the dashboard functionality of the Water Portal was used to:

- Reduced trivial alarm activity and increased focus on important events
- Evaluate the correlation of multiple data sources
- Recognise patterns, without the requirement to implement rules or complex custom programming
- Implement proactive monitoring rules and the ability to fix problems before a critical alarm occurs
- Apply historical data correlation based on network conditions
- Look at interrelationships between different data points and data sources
- Improve useability and customisability of the solution for day-to-day users

The PoC solution was built in a virtualised environment consisting of two main components as illustrated in the figure below.



The back-end was built on the KISTERS analytics platform using the WISKI server. The system consisted of a relational MSSQL database and the KISTERS water data server and client (WISKI). The KISTERS solution offers the functionality of a data hub to import, integrate, analyse and publish time series and metadata. The data from the specialised systems especially SCADA and the EAM are imported into the data hub through import scheduling services.

The front-end application for users and administration access was built on KISTERS portal Technology. The portal allows administrative tasks to create users and user permissions and to configure the core data displayed in dashboards and widgets. Individual users can configure individual data dashboards. In the case of the PoC this consists of alarming conditions and notifications. The configurations performed in the user dashboards will automatically be generated by the KISTERS water server.

The PoC focussed on testing a number of key intelligent alarming capabilities with the following results.

1. Integration of data sources

A key factor was the integration of different data sources across the domains of geospatial data (connectivity), metadata (operational data including work orders) and time series data (real-time and historical system information) to allow a holistic data analysis approach. The integrated disparate systems included (i) SCADA (ClearSCADA), (ii) EAM (Maximo), (iii) SCADA Historian, (iv) GIS (Intergraph) and (v) BOM data. Based on these data sources a connectivity model was built to link the assets and the associated metadata and time series information. The design is based on templates which allows users to roll-out similar data analytic techniques for several sewer and water operational areas. The data analytics engine was used to analyse the data using data aggregation, trending and artificial learning.

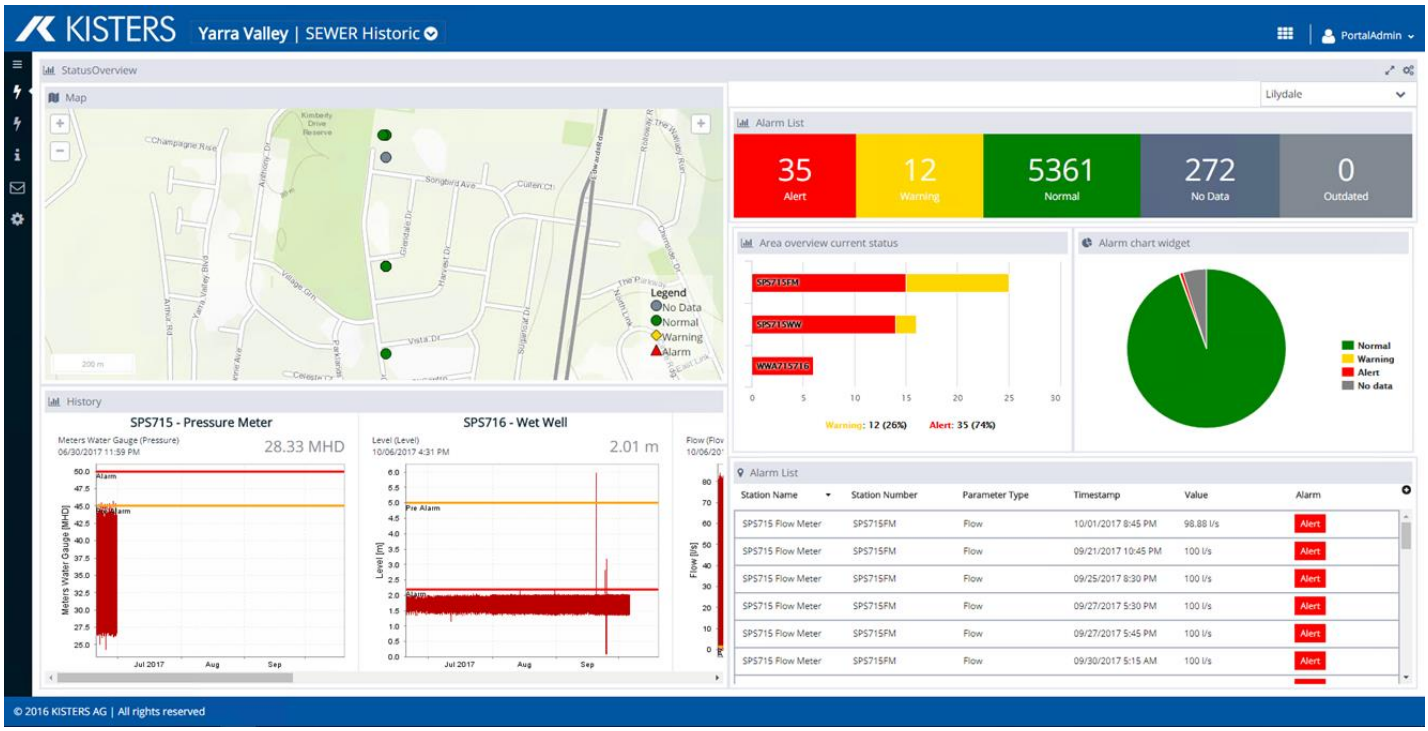
2. Data analytics for intelligent alarms and historical playback, alarm tuning and validation

Data analytics was performed and tested using three alarming use cases. These were (i) sewer blockage alarm, (ii) chlorine overdosing alarm and (iii) residual chlorine alarm. In all three cases the available historical information was used to identify conditions which potentially could lead to an incident and verified against conditions which had previously created an incident. The play back of the historical conditions over time allowed the user to create specific KPIs which characterised the three specific scenarios. These KPIs can be rolled-out over similar network configurations and tested with historical and real-time data. The sewer blockage alarm scenarios were successfully tested. The testing of chlorine overdosing and residual chlorine alarming is in progress.

3. Standard alarming dashboard as overview of real-time conditions (potential or detected incidents)

The calculated alarming KPIs and the underlying data streams were prepared in a web portal application to allow a direct overview of recent conditions. The web portal addresses two core overview options. It uses traffic light coloured

indicator widgets to display the recent status of a catchment area plan. The indicators can be changed via dropdowns to control the data selection (show KPI analytics or underlying data alerts). Additionally an overview page allows the complete data view of a specific time period enabling KPI development. See figure below for dashboard examples.



4. User customisable dashboards to create and customise alarms

Operators have customisation access to the system and are able to configure their own alarms. This allows operators to create their own thresholds to test the underlying developed KPIs against changing alarming conditions. This is a key functionality as it allows expert usage of the system without extensive training or programming knowledge.

The PoC showed the capabilities of the WISKI data analytics server and the dashboard functionality of the Water Portal to allow more sophisticated alarms providing greater accuracy, complexity and greater scale within SCADA. It requires more data points, more configuration (and significantly more manpower) and more monitoring required in order to define the next steps – as well as more alarms that must be investigated and managed.

Due to the complexity of managing such a system, SCADA typically only informs operators as to what has just occurred based on simple predefined rules, rather than the conditions leading up to those events or more insightful situational awareness of potential issues such as possible blockages or time to spill determined from the correlation of different data points over different time periods.

In the PoC a new intelligent alarming concept and application was developed which considers network conditions holistically (real-time and historically) by evaluating all available data streams, learning from events which happened in the past and thus allowing they system to adapt and optimise the alarming process continually. The front-end of the application is a web-based interactive portal viewer which aggregates the alarming status in several reports, allowing the configuration of alarm thresholds for expert users using personalised operator dashboards which provide standard overview dashboards for the management of recent conditions.

The outcome of the PoC will flow into a Water Portal based alarming solution and will be presented at Ozwater 2018 in May 2018.

WISKI Support Email and Help Desk

Contacts for the WISKI team at KISTERS in Australia:

Vicky, Chris, Markus and Callum (web developments) for specialised support for the KISTERS products WISKI, KiWQM, KiEco, KiDSM, KiALM, Water Portal, WDO and KiWIS.

The phone number for support is +61 2 6154-5200, and the email address is wiski-support@kisters.com.au.

If you are engaging in a particular dialog with Chris, Vicky, Markus or Callum please cc the support box so a central register of issues can be maintained.

The download portal can be found under http://kisters.com.au/downloadswiski.html , or can be accessed by navigating through to the support page from http://kisters.com.au .

To acquire a username and password to access the download portal please contact the KISTERS support team over the phone at (02) 6154 5200 or email at Wiski-Support@kisters.com.au.

Worldwide KISTERS News

You can keep up to date with all the news from KISTERS worldwide through the following links:

http://www.kisters.eu/news.html

https://www.kisters.net/NA/news/

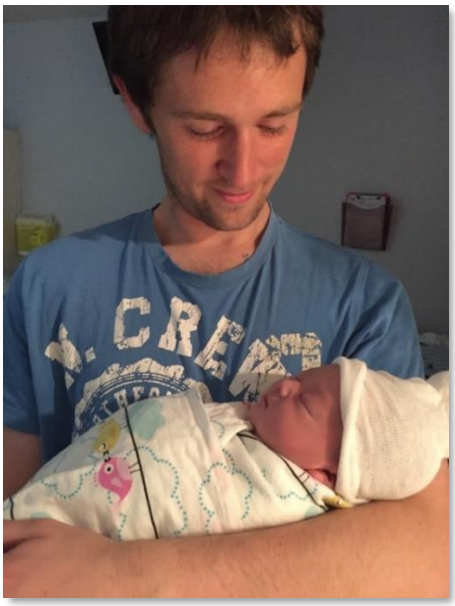
KISTERS On the Web

KISTERS technology is at the heart of an increasing number of customer web sites, whether they be based on Hydstra or WISKI web technology or their own web developers. You can visit a selection of client web sites via the link page at http://kisters.com.au/webpublishing.html.
If your web site uses KISTERS software please contact us with the URL and we'll add it to the list.

Staff News

New Staff in Training

Callum Ramage and his partner Eriko recently welcomed baby Lyle to the family. Congratulations to everyone on a fine job! Callum reports that Lyle is a calm and happy baby who already sleeps through the night.



Callum and Lyle

KISTERS Australia Christmas Party

The KISTERS Christmas party was held this year at the Zierholtz Brewery, which seemed suitably Teutonic. A fun night was had by all, as the accompanying photos might indicate.

KISTERS Training

Training Courses

We are happy to provide training courses on any aspect of KISTERS software provided there are sufficient people interested in attending. Please contact us at *support@kisters.com.au* with expressions of interest for any training requirements you have. We can provide training at your office or here in Canberra. Training in Canberra is based on a per-person per-day cost, provided we have sufficient people attending (typically six), alternatively we charge our consulting rate divided by the number of attendees, allowing for preparation time and meal costs. Training at your office will be charged at our standard consulting rates per day for the trainer, plus preparation days, travel and accommodation at cost. Courses we can offer include:

- Basic Hydstra
- Advanced Hydstra
- Hydstra Administration
- Administering Hydstra/WEB
- Hydstra Modelling with MODSYN
- Hydstra/SVR Server
- Ratings and Gaugings with Hydstra
- Exporting data to the BOM using HYWDTF_OUT
- Using Perl with Hydstra
- Groundwater Data Management with Hydstra
- Water Quality Data Management with Hydstra
- Basic WISKI
- Advanced WISKI
- KiWQM (WISKI Water Quality Module)
- KiEco (WISKI Biology Module)

Please contact us via support@kisters.com.au if you wish to attend. We will register you interest and notify you when the next course is planned.

Training Schedule for 2018

Upcoming training courses are now published on the KISTERS website at http://kisters.com.au/training.html.

The following training courses are currently scheduled for 2018:

Course	Duration	Dates
Basic Hydstra	2 days	2 - 3 May, 2018
Administering Hydstra	2 days	18 - 19 July, 2018
Basic Hydstra	2 days	17 - 18 October, 2018
Advanced Hydstra	2 days	21 - 22 November, 2018

If you are interested in other training or other dates, please email your interest to support@kisters.com.au.

Courses will be held at the KISTERS Canberra office. If you are interested in attending a course please contact us via support@kisters.com.au

Information

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