KISTERS Australia News

July 2015

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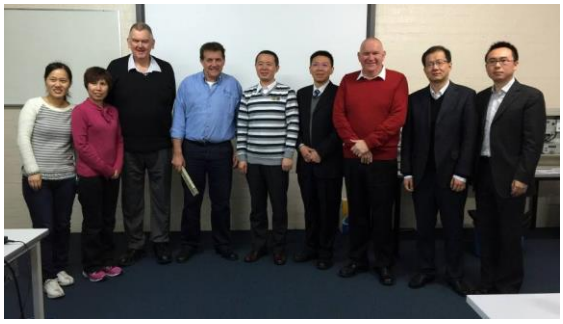
From The GM's Desk

By Bill Steen, General Manager, KISTERS Pty Ltd

The 2015 KISTERS User Group in September is fast approaching and KISTERS is well and truly underway in planning a great event in Canberra. As per previous meetings there will be a lot of information regarding new technologies, a global overview from Klaus Kisters, plus some exciting new developments within the KISTERS group.

With respect to global activities KISTERS has recently been awarded several major water quality and energy projects within the Australasia region. In conjunction with these projects KISTERS will be hosting various international delegations on technical tours here in Australia.

Recently KISTERS was visited by a Chinese delegation. The delegation represented current KISTERS clients who were visiting Australia to look at urban flood forecasting and water resource management. The delegation comprised of Chief Engineers and Deputy Engineers from three Chinese authorities.



I hope to see you all at this year's user group meeting

Bill Steen
General
Manager
KISTERS Pty Ltd

KISTERS Acquires Hydrological Services Ltd – Sydney

KISTERS is pleased to announce the acquisition of Hydrological Services Ltd. (HS), the Sydney based company. The company will become part of the KISTERS group, but will maintain its separate identity and function.

A number of iQuest and KISTERS clients are already using HS products, and a close integration with the IRIS data logger from iQuest and the KISTERS Water solution (Hydstra and WISKI) has already been achieved. KISTERS have always had the highest admiration for HS products, and we look forward to marketing them worldwide.

In a brief statement from the HS company Managing Director Joe Caruana said that he believes the acquisition by the KISTERS Group will expand the opportunity for our products and services in Australia, New Zealand and globally. Forming a new business unit "Monitoring" in the KISTERS group which will bring together iQuest with their smart telemetry solutions and HS with their variety of different sensors will help to develop new smart sensor systems which can easily be connected to different data collection platforms as well as to cloud solutions.

You can find out more about Hydrological Services at http://www.hydroserv.com.au/ or www.kisters.com.au

We have had an enthusiastic response from our clients after the announcement:

> Congratulations to the KISTERS Team. This new partnership should form a great powerful base to build your company. Pass on my congrats.
>
> *Mr Michael Wheaton - Environmental Services, Thiess Services Pty Ltd, Australia*
>
> Well done KISTERS - exciting times.
>
> *Mr John Skinner – Basin Planning Unit, Water NSW*
>
> Thanks for the good news! Congrats to KISTERS for the golden acquisition!! We are following up on opportunities…
>
> *Mr Pherry Mwiinga – Zambezi River Authority, Zambia*
>
> We are very pleased to have your information. We believe we are going to continue doing business with you. As you may know we are an Hydropower Company that has responsibility on a large Dam and reservoir.
>
> *Eng. Jose Rodrigues Matola, MSc - Senior Specialist on Hydrology&WRM, Hidroelectrica de Cahora Bassa, Mozambique*
>
> We appreciate the services and are looking forward to working with HS.
>
> *Mr Piasi Kaunda - Assistant Hydrological Officer, Ministry of Irrigation and Water Development,*

Malawi

KISTERS Australia User Group Meeting 2015

The Australian KISTERS User Group meeting will be held this year on 8/9 September 2015 in Canberra at the Hellenic Club, 13 Moore St, Canberra City 2600. This is the same venue we used two years ago.

The KISTERS Users Group meeting provides users with an opportunity to:

- Learn about the latest products and services
- Listen to informative user presentations on a wide range of products
- Participate in a question and answer session with our industry experts

Registration

The cost for the two days will be $650 inc GST. Please contact Debbie Cockburn for more information, or to register, at Debbie.cockburn@kisters.com.au.

The Hellenic Club does not offer accommodation, but there are plenty of hotels within walking distance in and around Civic. Please do not confuse the City Hellenic Club with the Woden Hellenic Club, which is a completely different location. The City club is in the middle of the city on a busy street with little parking, but there are several pay parking stations nearby.

Participation

To make this meeting a success, we need the participation of current WISKI and Hydstra users. If you would like to give a presentation on the product you are using or a related project, we would love to hear about it. Please contact Peter Heweston or Chris Michl to discuss proposals for presentations. Perhaps someone might like to talk about how to run a network with no money and no staff?

US KISTERS User Group Meeting 2015

The KISTERS US meeting this year will be held on September 14/15 at the picturesque Lake Natoma Inn in Folsom California just outside Sacramento (yes, that's the Folsom of Johnny Cash fame). Please contact Jennifer Durda (jennifer.durda@kisters.net) for more information.

iQuest User Group Meeting 2015

The iQuest User Group Meeting in Hamilton 25-28 August 2015 is gaining momentum, the agenda has now been released and registrations are being received. We look forward to your feedback regarding your training requirements – the plan is to release a training agenda during early August.

You can find the iQuest User Group Meeting Agenda at http://www.iquest.co.nz/iQUGMAgenda.pdf

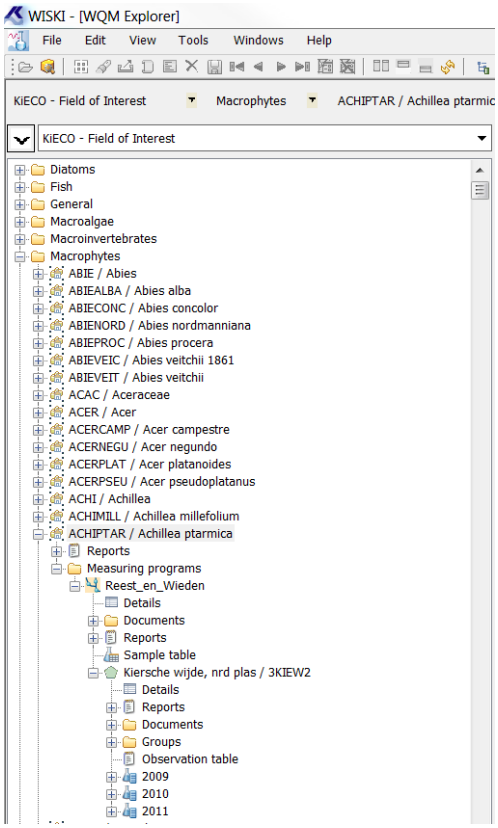
Please register your organisation interest and provide feedback on what training content would be useful for your staff on iquest@iquest.co.nz

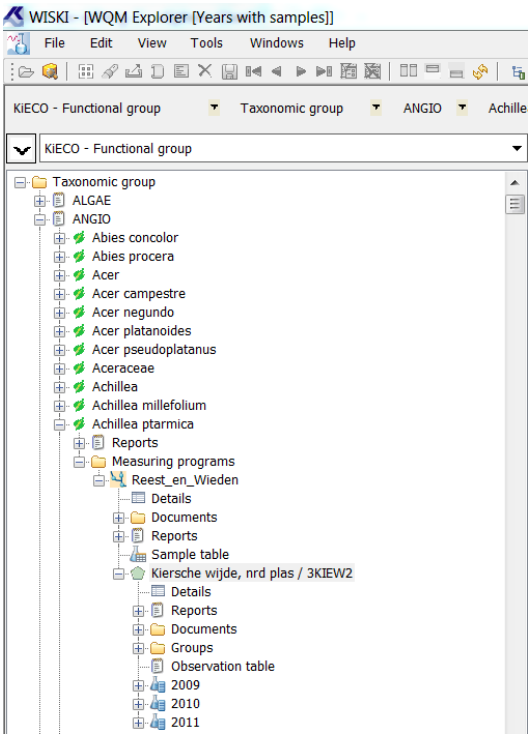
KiECO – KISTERS Biological Module

The development of the KISTERS Biological module (KiECO) began in 2013 with a project started at the NSW Office of Water designed to house their wide ranging and disparate biological data, which had been collected over many years, within a single data repository. The result was a database structure that can handle the complexities of biological observational data that fully integrates with all of the features of the base WISKI/KiWQM software. In the past two years many new clients have come on board from Europe and North America and significant further development has taken place. The main features and functions of the KiECO module are described below.

Taxonomic tree

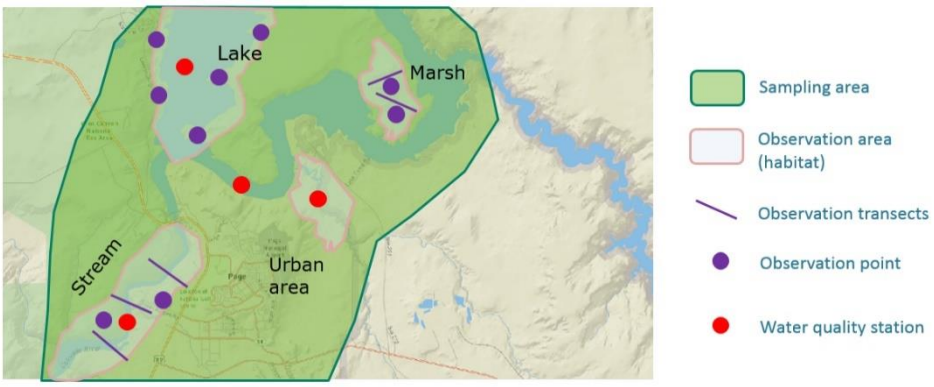
- A hierarchical taxonomic tree (with primary and secondary ranks) that changes over time (synonyms, lumping, splitting etc.)
- A flexible meta data structure allowing customer specific data to be stored against a particular type of taxon e.g. CAPS code for vegetation, CAVS code for fish, IUCN threat category etc.
- Explorer views are provided with the classic Linnaean structure or customer specific views can easily be configured e.g. by functional group, field of interest etc.



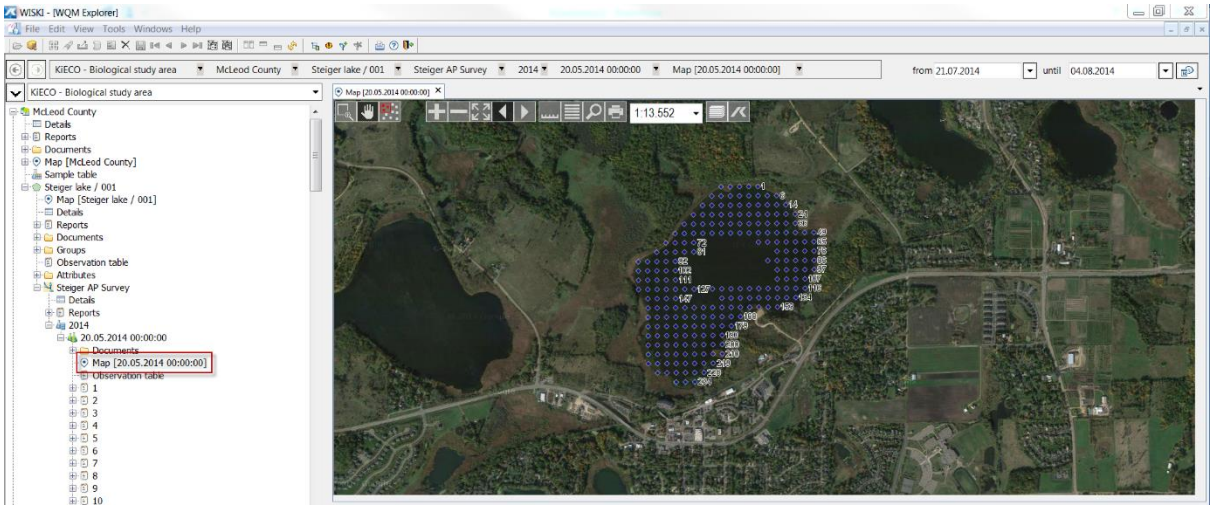


Extended locational representations

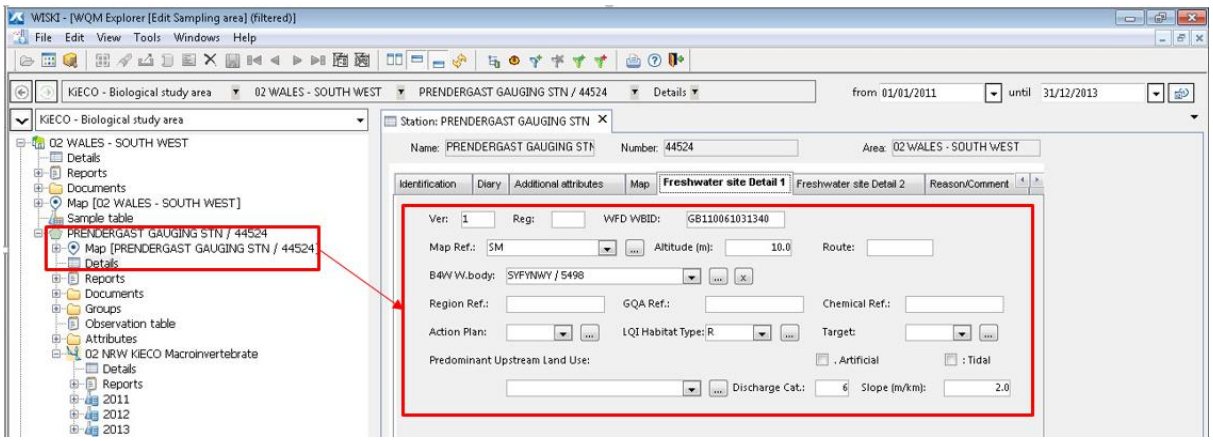
- A new flexible structure to better represent biological projects featuring study areas, sampling areas, observation areas and observation points that can be represented by points lines or polygons.



- Full GIS integration with KISTERS mapping products

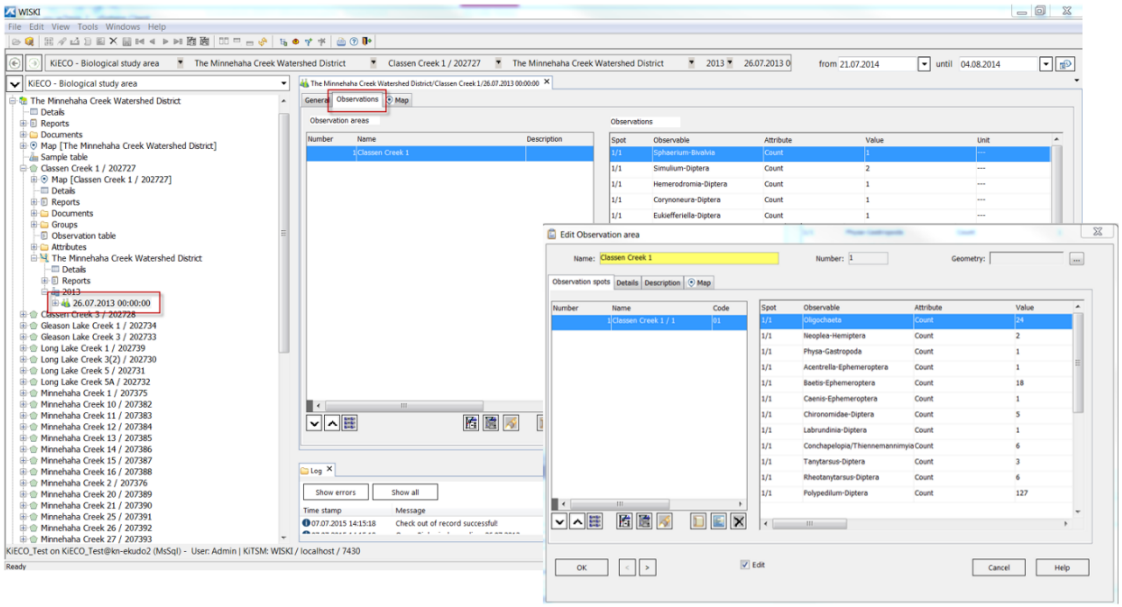


- The standard ability to extend metadata to meet customer specific requirements and link documents at different points of the structure



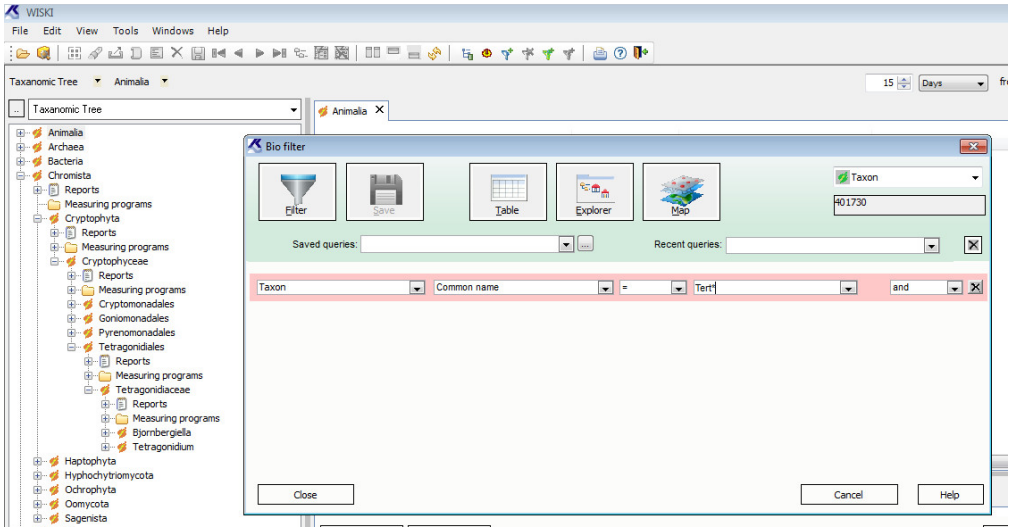
Biological observations

- An observation can be stored for any taxon at any point in the tree e.g. counts, heights, life stages etc.
- An observation may also be stored for a general environmental parameter e.g. grazing impacts, % litter, pug marks etc.
- The observation data types and units are wide and varied e.g. strings, key lists, numeric, yes/no etc.

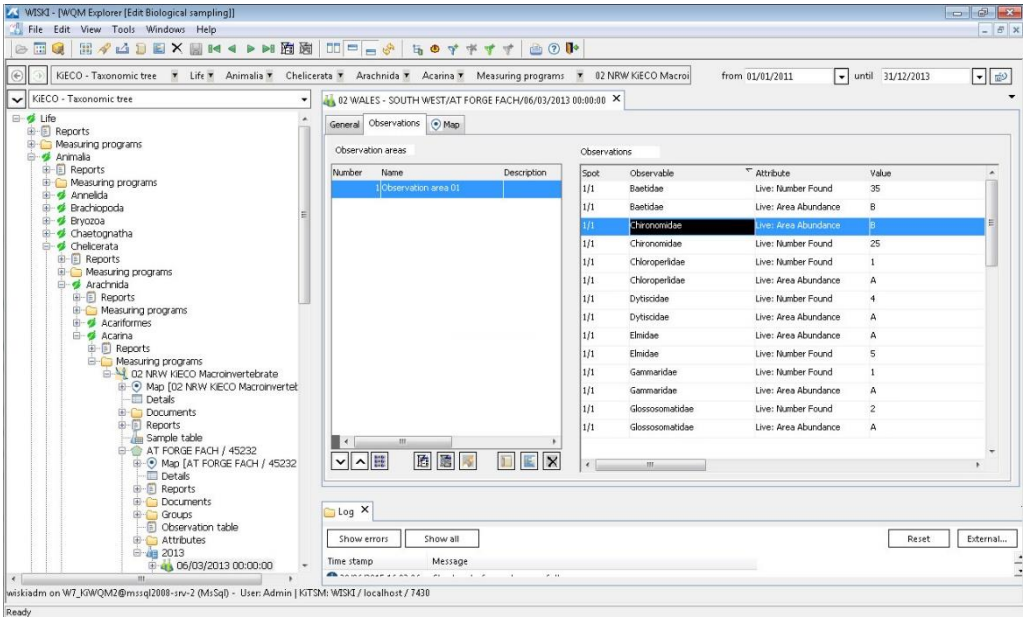


Biological data discovery and representation

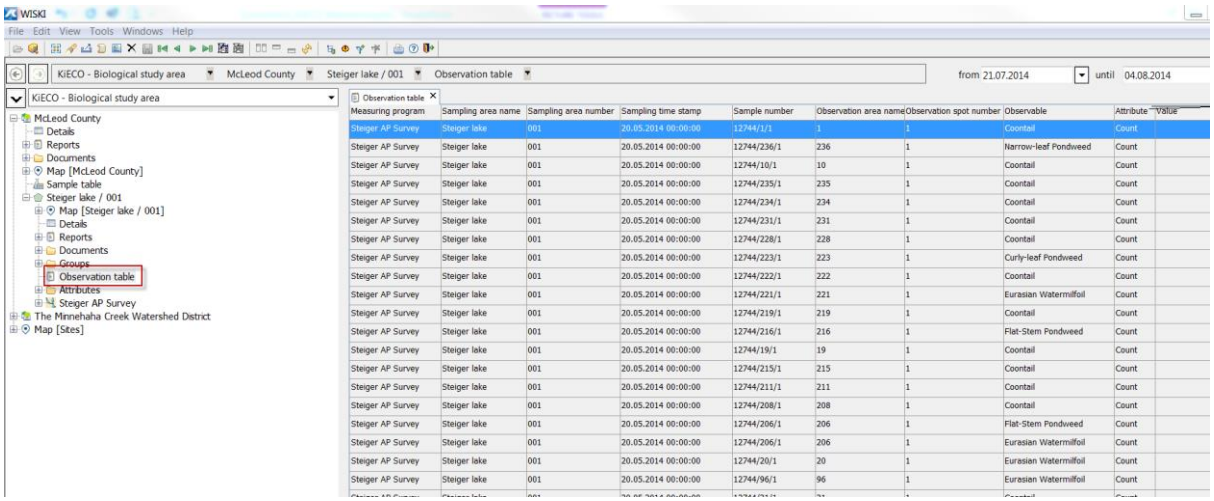
- Biological data querying and filtering tools available including the ability to view results in a map



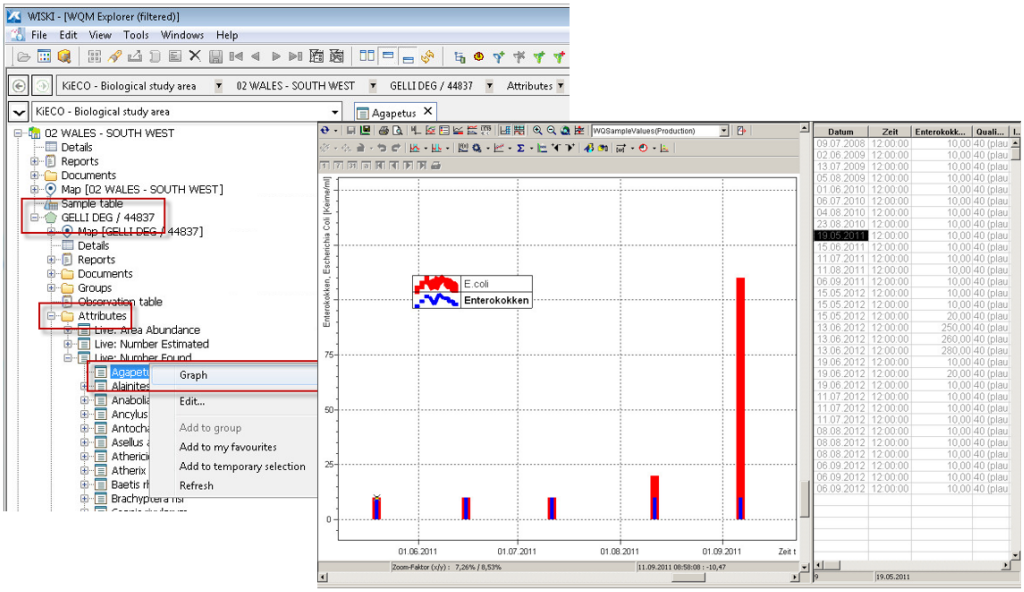
- Full integration into the standard tree view structures allowing observation data to be viewed at any point in the tree



- Tabular representation of biological data in observation tables

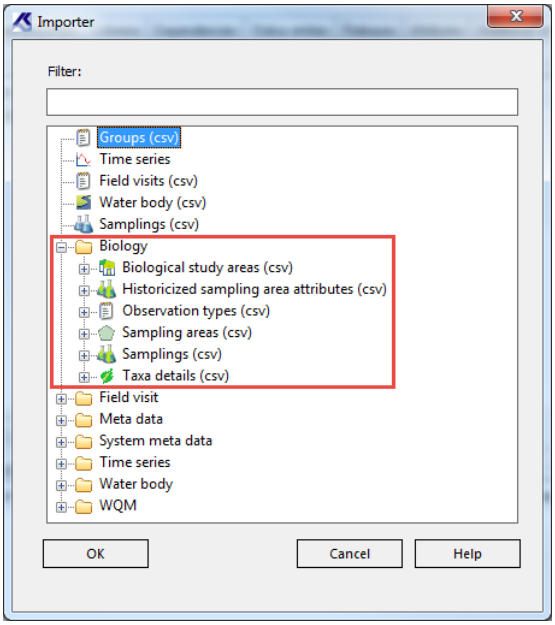


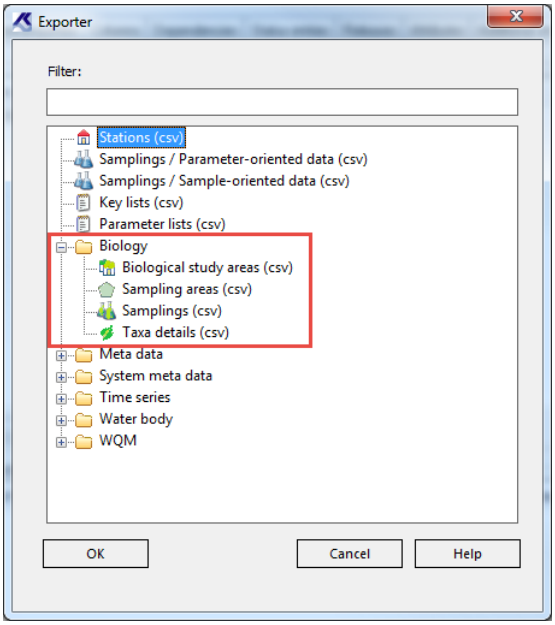
- Graphical representation of biological data using data sources



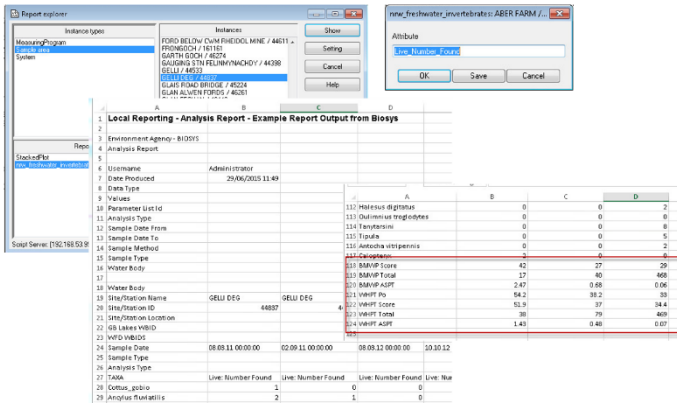
Biological data import, exporting and reporting

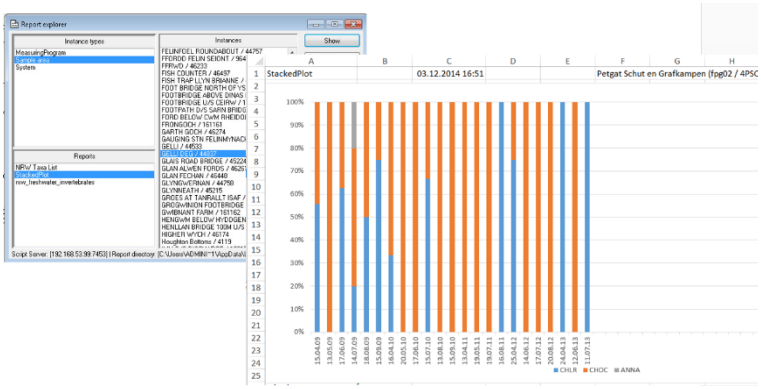
- Data import and export and export functions within the standard csv framework





- KiScript reports can be developed to report on biological data as required by the customer, a number have already been created :





The advantages of the KISTERS solution for your biological data, KiECO, is that you can house your hydrological, water quality and biological data all under the same system umbrella and undertake a holistic, integrated analysis of your environmental data. Please contact us for a demonstration.

NSW Office of Water Upgrade

By Peter Heweston

In early June a crack team of geeks comprising Tony Caine, Damian Skinner, Peter Heweston and Denby Angus locked themselves in a room for a couple of weeks to complete a major redevelopment of the NSW Office of Water's Hydstra installation. During that time we completed the following tasks:

- Moved most processing to a powerful cluster of new servers
- Upgraded to Hydstra V11
- Migrated the system to SQL Server
- Upgraded two web servers to V11
- Merged data from a separate Hydstra/GW system
- Updated groundwater time-series to use dotted sites and migrated historic groundwater time-series data
- Documented the system architecture

The task was made slightly exhilarating because the Department didn't have quite enough available server capacity to do a full parallel test install of everything before going live, and there's nothing more exciting than committing to an upgrade when there's no going back! However much to everyone's satisfaction the process went more or less according to plan and the system was brought up and running in its new configuration with minimal outage. Of course a number of issues slipped through the gaps, and we are gradually fixing them up as we find them. For example the transition to dotted sites was messy, the slightly irregular use of CODEGRPS led to a flurry of validation problems that needed to be fixed, and an oversight in our UPGRADE code led to thousands of HISTORY and HYNRS documents being stranded until we fixed the folder names.

A few facts and figures might illustrate the scale of the migration task:

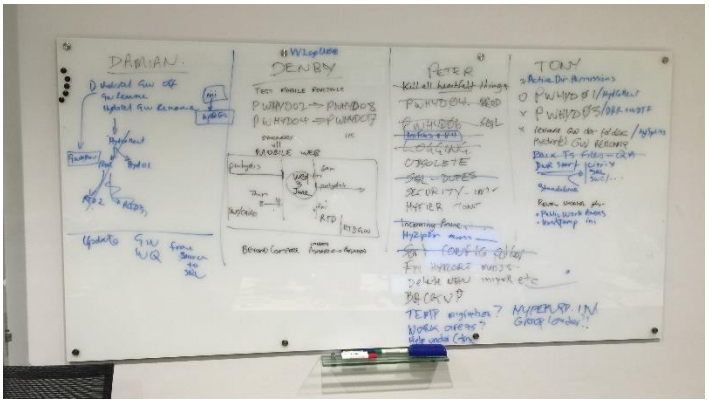
Number of Hydstra servers inside the firewall	10
Number of Hydstra servers outside the firewall	2
Number of SVRRUN instances	2
Number of SVRIMP instances	2

Number of TS archive files	2,140
Number of work and auxiliary files	30,000
Entries in SITE table	160,000
Incoming files per hour	3700
Number of registered Hydstra users in PASSWD	480

We learned a number of lessons during the migration, which are summarised here. We will be discussing the issue in more detail at the forthcoming KISTERS User Group meeting in September.

- Use HYDLOGEX and HYWOTSUP to explore your logs every morning and resolve systemic problems as soon as possible
- Keep all Perl and batch jobs in INIPATH, including dumps of databases that may contain Perl code such as SVRACT, LOGMAST etc. This makes searching code a simple matter of running gnuegrep over INIPATH. Use HYMANAGE exit code to save the tables to CSH format.
- We developed a new tool HYINIDEPENDS to look through a big INIPATH and report on what calls what. It helps in deciding what is still current.
- Groom your INIPATH. Make an \obsolete folder and move old code into it. INIPATH should only hold current scripts and configuration. Control access to INIPATH so every man and his dog doesn't leave files lying around there.
- After migration to SQL Server any embedded SQL statements will need attention. This includes stored HYDBSQL jobs, as well as SQL HYSTNS expressions. SQL ain't SQL, and SQL Server SQL is different to Foxpro SQL in many ways.
- Avoid SVRTRIG trigger expressions that contain expensive HYSTNS expressions, such as FILTER(TABLE(SITE),MATCH(GW*)) - these can be very slow to evaluate. Use HYSTNS caching or create a group or text file and update it nightly.
- Watch out for HYPERUPD, in full mode it writes a text file which can be quite slow. Don't run a full update on every site, save them up.
- Trim your telemetry files regularly. Processing time is a function of file size, so keep your telemetry files down to a few months of data at most, and move the rest to another datasource every few months.
- SVRIMP has basic limit checking and encoding built-in. Use it in preference to complex HYAUDIT tasks to remove outlier values.
- Instrument any naked batch jobs with HYLOGIT calls so you can see how often they are being called. Jobs that contain Perl will be automatically logged anyway.
- Use HYLOCK to avoid contention, but be sure to test ERRORLEVEL after every call, and go to end if denied a lock. HYLOCK does not log fails, so explicitly log if you need to.
- Hunt down and kill any explicit references to HYDLOG.TXT, as in V11 the files now have different names and live in different places. Use HYLOGIT to make log file entries in batch files, and use Prt('-H' in Perl scripts.
- The KISTERS Logviewer folders under \hyd\sys\run need to be read/write even though the rest of \HYD\SYS should be kept read-only.
- Close the DLL as soon as possible in scripts, and clear the cache as soon as you change sites by calling ClearTSCache and CLearDBCache. This avoids holding resources open any longer than is necessary.
- You can access the thread number in SVR jobs using
  `Call hysetenv serverthread`
  Include the thread number in any hard-wired report file names to prevent clashing when writing report files.

The War Room



Lists and More Lists

Hydstra Product News

Hydstra V11 Release

Hydstra Version 11 has been released for a while now, and is available for download from http://kisters.com.au/downloads.html . You will need to contact us at support@kisters.com.au for a V11 HYACCESS.INI before you can use it. We suggest you do a trial upgrade on a copy of your 10.04 system first, before going live.

If you work closely with other agencies and trade Hydstra data with them you should liaise with them before upgrading. If you run Hydstra/WEB you should liaise with Denby Angus and set up a test V11 web server.

Patching V11

A new patch is released every Friday, subject to release procedures completing successfully. An increasing amount of new development is now patched back to the current release, and is explicitly marked in the Change Log as having been patched. For example you might see an entry in the patch log as follows:

> ***KiWIS available over Hydstra (2015/06/26)***
>
> The KISTERS product KiWIS (**KI**STERS **W**eb **I**nteroperability **S**olution) is now available for installation over Hydstra. KiWIS provides standard publication formats to the outside world including WaterML2, SOS etc. Please contact KISTERS Pty Ltd for KiWIS information and pricing. In order to use KiWIS over Hydstra you will need a Hydstra /WEB or Hydstra/WSI (web services) licence as well as a replicated Hydstra system outside the firewall.
>
> *This feature has been patched to v11.00.*

As we slightly relax the rules about what we can and cannot patch it has become increasingly important that you run HYPATCHUP after installing a new patch. HYPATCHUP is configured to do whatever is necessary, but it may include restructuring and reindexing databases, and without running HYPATCHUP your system may be broken in some areas.

SVRIMP and SVRRUN Enhancements

SVRIMP has been enhanced to provide built-in data range validation, potentially using the same STNINI keywords as HYAUDIT. You can apply upper and lower range limits, with the choice of quality coding the point bad, removing the point completely, or setting the value to the limit. We don't offer rate of change limits as SVRIMP deals with data on a point by point basis.

You can also install SVRRUN and SVRIMP .EXE as services, and run multiple copies of SVRIMP. We deliver

SVRIMP1.EXE, SVRIMP2.EXE, SVRINP3.EXE and SVRIMP4.EXE so you can run multiple copies of SVRIMP as services.

SVRMON has been enhanced to deal with multiple copies of SVRIMP running.

SVRMON and SVRRUN have been enhanced to colour code each task window green for running tasks, red for idle.

These features have been patched to V11.

Automation Files for Batch Running

We have introduced the concept of an automation file, with extension .AUT. An automation file holds in one JSON structure the following components that may influence the running of a Hydstra job:

- Job parameters
- Command line switches (such as /HIDE, /QUIET etc)
- HYCONFIG overrides (such as TEMPPATH, DBSEARCH, etc)
- INI file overrides (any relevant INI files, such as HYPLOT.INI, WIP.INI etc). INI file overrides can add or replace a section or keyword.

You run a program with an automation file using @ syntax:

```
HYPLOT @c:\temp\temp\hyplot.aut
```

Automation files will most commonly be written by Perl scripts that need to bundle up a complex environment prior to running a job.

Support for automation files has been patched to V11.

Exploring HYDLOG Files in V11

In Hydstra V11 we introduced a new centralised location for all HYDLOG files – under \\hyd\dat\hydlog in dated subfolders. HYDLOG files are kept for a certain period, specified in HYCONFIG.INI as HYDLOGDAYSZIP and HYDLOGDAYSKEEP. After HYDLOGDAYSZIP the files are zipped into daily zip files, and after HYDLOGDAYSKEEP they are completely deleted. We deliver default values of zipping after 3 days, deleting after 60 days, but you should think about these values. Make them both very large if you want to preserve your log files unzipped for a long time., but watch the size, as a busy system can generate hundreds of MB of log files every day.

There is a wealth of interesting information in those files about the behaviour of your users and your system, and we have developed and patched a new program HYDLOGEX, the HYDLOG Explorer, to mine your HYDLOG files for nuggets of information. You can find out what your biggest SVR jobs are, who is using Hydstra and when, what programs and scripts are being used, what processes are generating errors, plots of throughput by time, queue sizes for SVRIMP and SVRRUN and much more. We have plans to further improve the logging of web user behaviour, possibly to include which sites were accessed, data volumes downloaded, IP address of web users. etc.

HYDLOGEX is driven by a series of plugin Perl modules,. We deliver a handful of useful plugins already, and new modules can be easily developed by us or you.

In order to consolidate your log information we suggest you send the HYDLOG log folder on your web server back to the production HYDLOG folder. A simple Syncovery job can do this from time to time.

HYDLOGEX is available in the latest Hydstra patch from the web site.

Server Job Run Times

Server Job Name	Total Time (secs)	Count	Mean (secs)
incoming_ts	497611	11407	43.62
hyperupd_prov_web	46005	13	3538.82
hytelsum.catchments	9456	16	591.03
hytelsum.hourlyreportsets	8546	29	294.69
hyxmlout.2012to2010	3362	14	240.17
daily_0900_telemetry	2954	1	2953.67
exports_sws_carms_last10	2684	16	167.75
inst_export_lookups	1569	1	1569.37
daily_1500_telemetry	1565	1	1564.76
calcbre	697	34	20.50
calccoli	646	32	20.17
hytelsum.hydro.clienttelemetry	534	1	533.81
calcwilc	525	26	20.21
calcmenindee	470	18	26.09
dwr2snowy_hourly	384	15	25.59
hyrep.check.tsfiles	357	1	356.92
kpi_rollup.bat	244	1	243.78
hytelsum.hydrotel.report	195	29	6.72
hyxmlout.100to116	159	14	11.39
change_a	156	13	12.03
drrsync2winfo	126	16	7.88
drrsync2rtd	122	16	7.62
gaugupd	117	25	4.67
hytelsum.clients_dhannon_0900	56	1	56.00
dwr2snowy_daily	34	1	34.33
hyextr.hunterwater.8am151	29	1	28.59
hytelsum.clients_apearce_1000	23	1	23.43
hytelsum.clients_apearce_0700	23	1	22.61
hytelsum.dailyreportsets_0930	20	1	20.19
hytelsum.dailyreportsets_0730	19	1	19.34
dwr2snowy_export_1	17	1	16.95
hytelsum.dailyreportsets_0630	16	1	16.24
hytelsum.dailyreportsets_0830	15	1	15.47
hycsv.deltaelect.1200	15	1	15.07
hycsv.deltaelect.0930	13	1	12.86
hyclone.snowyhydro.incoming	10	1	9.62

Example HYDLOGEX Analysis

HYBOMEXP Restored for HCS Purposes

We have decided to revive HYBOMEXP as we didn't realise how many people were still using it to send flood data to the Bureau of Meteorology in Australia in HCS format. HYBOMEXP has been restored to V11 and V12 – please rename any HYBOMEXP.HSC from your INIPATH if you wish to use the delivered version.

HYBOMEXP can only send HCS data, the BOM is no longer able to process the XML format data that it used to deliver, please switch to HYWDTF_OUT to meet your data delivery obligations under the Water Act.

HYRATED problems over SQL Server

We have uncovered a snakes nest of problems when using HYRATED over SQL Server. The problems come down to minute rounding differences when saving real numbers away in SQL Server as compared with Foxpro, and it has taken us a while to plug all the holes. We believe we have now found and fixed the last little wriggler. If you plan to use HYRATED over a SQL Server system please download the latest patch set of 24/07/2015. Apologies and thanks to Environment Canterbury for their patience.

New Configurable Web Service Provider

A new and simpler web service module *webservice.server.pl* has been developed and distributed in recent V11 patches. The old web service gateway *webservice.server.p*l is now deprecated.

In order to publish your data via Hydstra web services you need to purchase a full Hydstra/WEB licence or a Hydstra/WSI web-service-only licence. Then you may need to replicate your Hydstra system outside the firewall in order to make the services publicly available. If you only wish to make the service available in-house then replication is not needed.

If you wish to use the default data set of your Hydstra system, just start using the new web service gateway e.g.

```
http://my.domain.com.au/cgi/webservice.pl?{"function":"get_variable_list","version":1,"params":{"site_list":
"201001","datasource":"CP"}}
```

The web service always assumes the ACCPATH (full path and filename for HYACCESS.INI) folder is the same folder as for CONFPATH.

The \temp\ prefix should be the same as the Hydstra system hosting this web service script to simplify housekeeping.

The web service will create a separate TEMPPATH for each call with the 'ws' prefix, e.g.

```
c:\hydstra\webv11\temp\webhyd\ws082672119\
```

If you configure the root TEMPPATH \temp\ the same as your core Hydstra TEMPPATH, your scheduled WEBCLEAN.BAT job will remove stale sub folders. otherwise you will have to create another scheduled task to do the job.

You will then be able to access the web service for the target data:

http://my.domain.com.au/wsi/webservice.pl?{"function":"get_variable_list","version":1,"params":{"site_list":"gw000002","datasource":"CP"}}

For in-house use you can call any HYDLLP call via the web service but of course the consumer needs to know which datasources, variables and quality codes are being used. For external use we recommend that you read up on, and configure, Standard Hydstra, and publish data via the Standard Hydstra interface. Standard Hydstra uses a controlled vocabulary for datasources, variables and quality codes, which allows the same client code to run across many different Hydstra datasets transparently.

It is possible to configure the web service to deliver data from more than one dataset, please contact KISTERS Support for more information on how to do this.

Consumers of HYDLLP and web services can use any language to call the service and parse the resulting JSON data. We provide examples in a number of languages in \hyd\sys\perl\examples, in particular we have recently provided an example of how to consume JSON data in Excel, see:

```
\hyd\sys\perl\examples\HYDLLP Excel JSON Example.xlsm
```

HYIMPEXP Changes Planned for V12

We plan to make some breaking changes to HYIMPEXP in V12. HYIMPEXP was designed primarily to transfer Hydstra data between offices of the same agency, and users who use it for that purpose will not be inconvenienced in V12. However uses of HYIMPEXP that involve transferring data between different agencies may need to attend to their scripts once V12 arrives.

You may be away that in V11 we already switched from moving around .DBF files to using .CSH files for database table data. This was to cater for SQL Server users, and in preparation for a future where .DBF files may no longer be involved at all.

In V12 we plan to move time-series files around in .CSV files exported by HYEXPORT. You will be able to choose whether to use compressed format .CSV (for greatest speed, minimal size, but some complexity) or uncompressed (larger, slower but simpler files). For use within an agency these changes will make little difference, but for inter-agency transfers it might create some work for you.

One result of this is that V12 HYIMPEXP will no longer be able to import native Hydstra TS files, which in turn means that the recipient of HYIMPEXP and the sender need to be using the same format. To assist in making this easier to do we propose to release a patched version for HYIMPEXP for V11 which will export CSV files. However we won't release this patch until after V12 is released so that we don't break any current transfers.

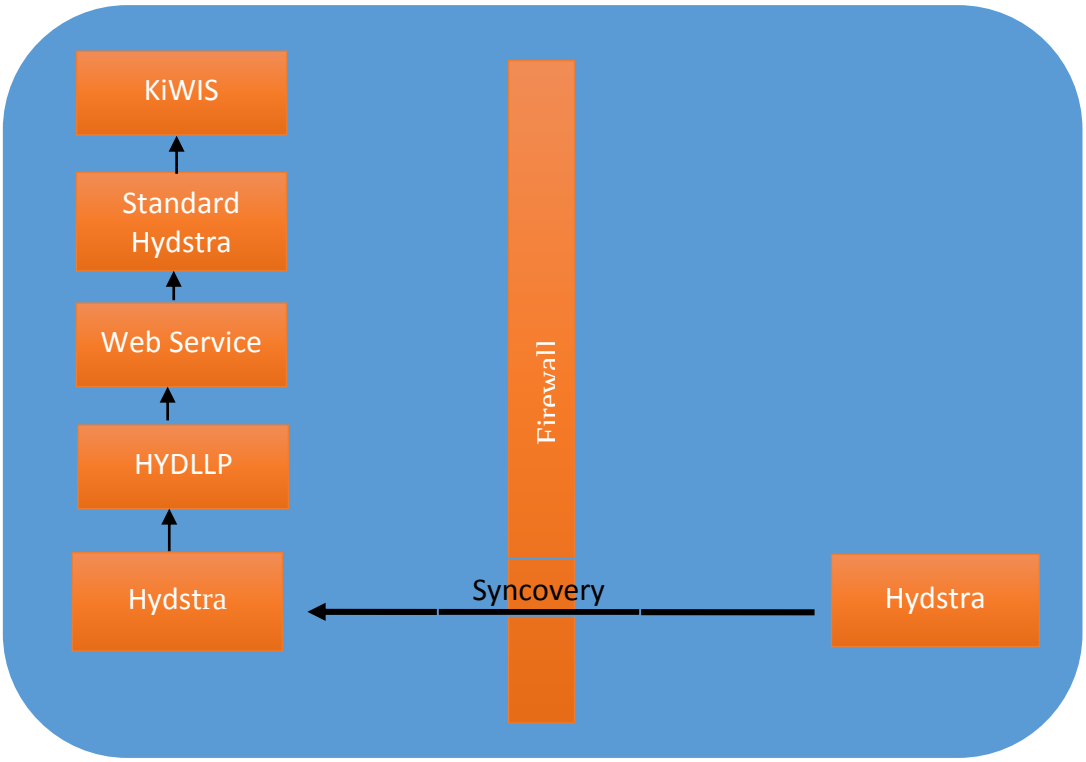
Another effect of the change is that HYIMPEXP will be somewhat slower in V12 as it has to rewrite every time-series file to CSV rather than just copy it.

It is unlikely that V12 will be released until later next year at best, so there is plenty of time to plan for this

change.

KiWIS over Hydstra

As part of a recent project in New Zealand we installed and configured KiWIS, the KISTERS Web Interoperability Solution, over Hydstra. KiWIS publishes open standard protocols like WaterML 2.0 and SOS which allow web users to query Hydstra data. KiWIS is the top layer in a series of protocols that sit on a web server and publish data to the outside world. Under KiWIS lie Standard Hydstra, Hydstra/WSI web services, and ultimately HYDLLP. Please contact KISTERS for more information on Hydstra/WSI and KiWIS.



HYFL4 Withdrawn in V12

We plan to remove support for HYFL4 in V12. HYFL4 reads data from ISCO loggers in ancient Flowlink 4 format. Since Flowlink5 has been available for years and is supported by HYFL5 we believe there are no users of HYFL4 left anyway.

Hydstra V9 Unsupported

With the release of Hydstra Version 11, Version 9 has become unsupported. It is worth noting that Hydstra V9 will not run under Windows 7 or Windows 8, nor will it run under 64 bit Windows. If you are still running V9 (or earlier), please make every effort to upgrade soon. You will need to run the upgrade in two steps - V9 to V10, then V10 to V11. You will need two HYACCESS files from us to push through the process.

If you feel that the process is beyond you, we will for a flat fee of $1500 accept a USB memory stick containing your complete V9 or V10 running Hydstra system (with everything under the *\hyd* directory, including *\hyd\sys*, *\hyd\dat*, *\hyd\log* etc) and return you a running V11 system on the same USB stick by Express Post. You must be running Windows 7 or later to run Hydstra V11. You must refrain from using Hydstra while your system is with us. This offer does NOT extend to fixing up scripts in INIPATH, which are by definition unsupported, nor does it include configuring SVRIMP or SVRRUN.

If you are running even earlier versions of Hydstra contact us for a quote to upgrade them to V11.

Hydrotel Hydstra Conversion Agent

Malcolm Barr, iQuest

The HydroTel™ Hydstra Conversion agent is designed to have HydroTel extract variable conversion values directly from Hydstra latest rating. That is, HydroTel reads in water level from the datalogger and then derives flow from the latest stored rating table in Hydstra. This agent uses the get_varcon function in Hydllp.dll to convert values and insert the result back into HydroTel to avoid the need for duplicating rating tables in HydroTel and Hydstra. This will offer the end users the following benefits:

1. Maintaining a single rating database - removes duplication and potential for databases becoming out of sync.
2. Removing the manual process of keeping the HydroTel rating database up to date in order to derive flow in HydroTel and the web.
3. Flow reported using the HydroTel web is always in sync with the latest archived rating stored in Hydstra.

Configuration details are documented in the HydroTel™ Help in release 4.19. Contact iQuest for more details, and for pricing information.

WISKI Product News

Release Management

All WISKI and KiWQM customers in Australia and NZ are using in production the WISKI 7.4.1 or 7.4.3 line. In 2015 one additional release for 7.4.1 is scheduled for beginning of November (release SR 18, with end of development beginning October). All planned enhancements for 2015 need to be scheduled for the version above based on the end of development date or for the new WISKI 7.4.3 release.

The introduction of WISKI 7.4.3 will be presented and discussed in the upcoming user group meeting.

Support Email, Help Desk and Bugzilla … just a reminder

The WISKI team at KISTERS Pty Ltd (Vicky, Bruce, Chris and Callum for the web developments) offers specialised support for the KISTERS products WISKI, KiWQM, KiECO, KiDSM, KiALM, WISKI Web 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, Bruce or Callum please cc the support box so a central register of issues can be maintained.

Clients can also formulate their own Bugzilla cases once it is agreed with WISKI support that the case is classified as a bugfix or enhancement. We can assist you to step through this process in the first instance. In addition Bugzilla can be a good way for customers to track the progress of all the outstanding and past cases of their organisation. Please contact us if you require a Bugzilla account to be created.

Water Data Online – web solution for water data of Australia (http://www.bom.gov.au/waterdata/)

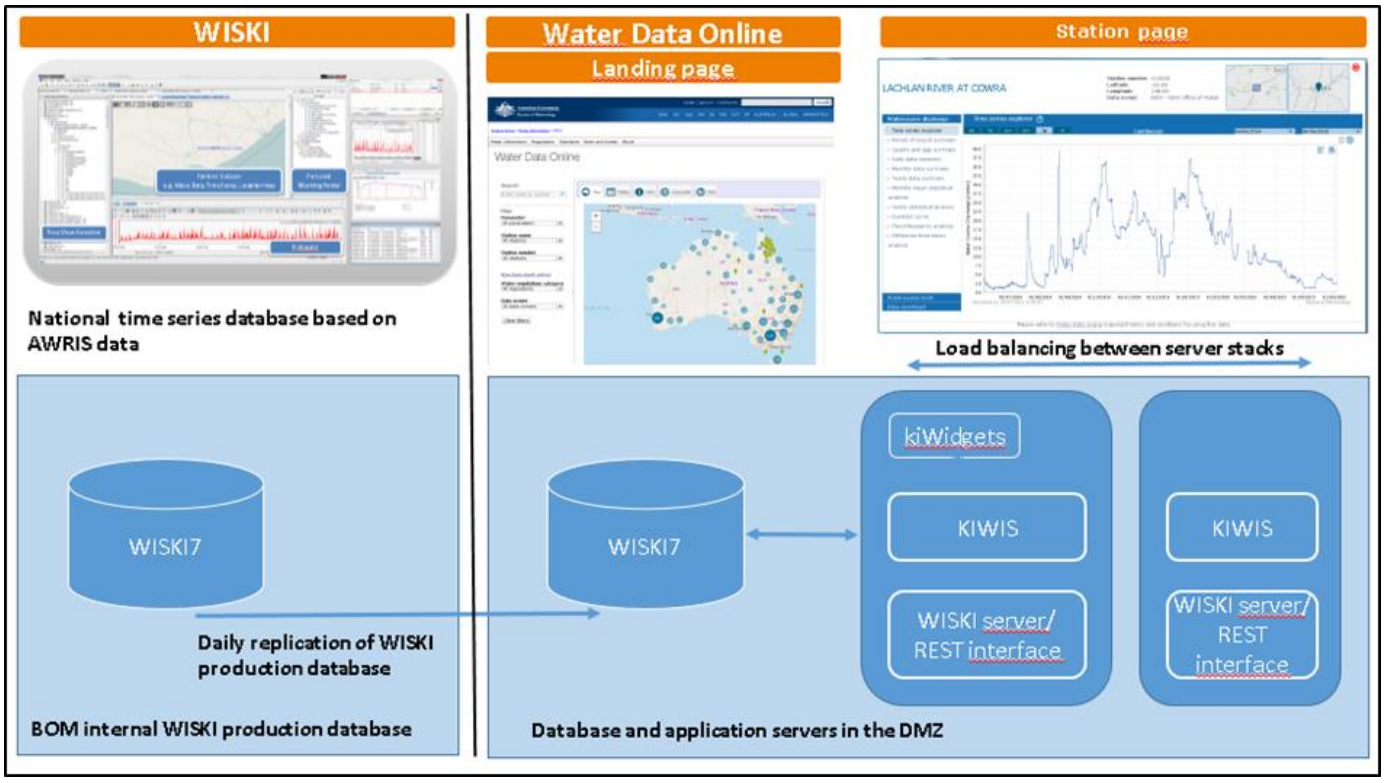
Water Data Online (WDO) was publicly released by the Bureau of Meteorology on 20th October 2014. The system was already presented at the KISTERS user group meeting in 2014. Since then a second release of WDO in April 2015 provided improved reports, removal of data download limitations and support for data access through the OGC Sensor Observation Service (SOS). A third release of WDO will be released in July 2015 providing additional access to ratings and gaugings data and the calibration curves that are essential to the interpretation water observations data. Also a tool that will allow new parameters to be quickly and easily added to WDO was developed.

WDO is developed as a scalable cluster system with direct access to replicated data from the Australian Water Resources Information System (AWRIS). The technical solution addresses issues of:

- Direct data access to AWRIS,

- Scalable and load balanced web application servers, and
- Extensible front-end using JavaScript widgets.

The system is mainly based on the KISTERS products of KiWIS and KiWidgets as shown in the architecture of the system below.



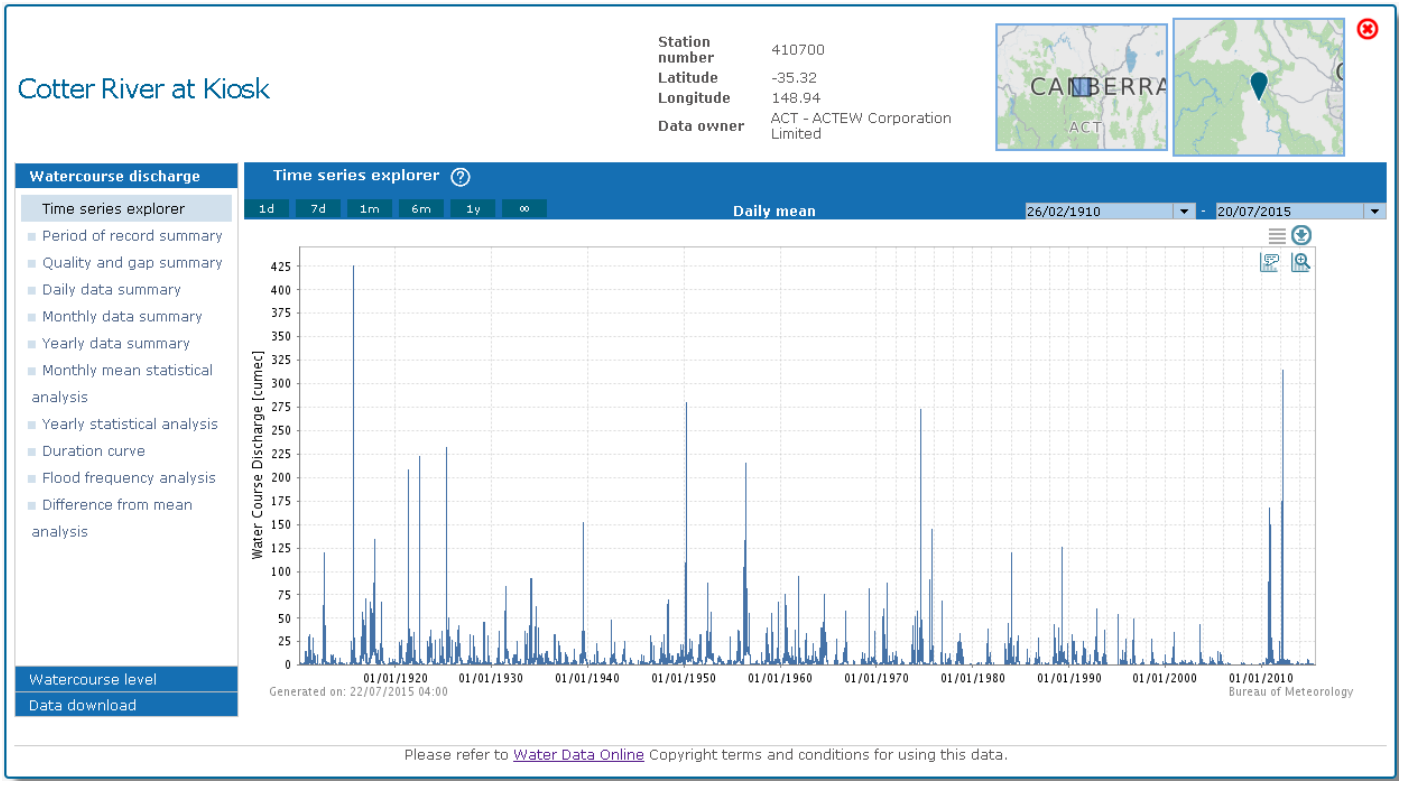
The core part is built by application server stacks which consist of a fully functionally WISKI server system with REST interface, the KiWIS application and KiWidgets. The used architecture makes the system easily scalable for national systems like at the BOM using data replication and several servers or to smaller state and council systems which might not use the data replication and only one server system.

A fast response time is guaranteed as KiWIS harvests the station and timeseries lists every six hours for direct access out of system memory to allow fast data allocation. The front-end is built using javascript widgets which are configured using a JSON editor. The widgets provide access to several reports which are described below. The data for the report widgets are supplied by KiWIS via the REST functionality of the WISKI server.

Persistent URIs for WDO station pages are also available. WDO graphs for stations can be included directly into external web pages using the HTML <embed> tag, or can be linked to through a URI which is constructed from the station number and wNumber for the data owner. For example, the URI for the Cotter River at Kiosk, station number (410700) from ACTEW Corporation (w00002) is: www.bom.gov.au/waterdata/station.html?dataowner=w00002&station=410700.

The central access to WDO is managed over the station explorer which has a map, table and navigation interface. The explorer also enables searching with free text, station name, station identifier and data filters. The search results are displayed on the mapping window and table. The mapping window also enables pan and zoom with additional station detail available through a mouse over of station location pins.

When selecting a station the data explorer for the station is opened supplying basic meta data for the station. The data explorer allows access to the dynamic time-series data exploring and downloading tool along with 10 standardised reports and dynamic hydrologic analysis tools. An example of the data explorer is shown below.

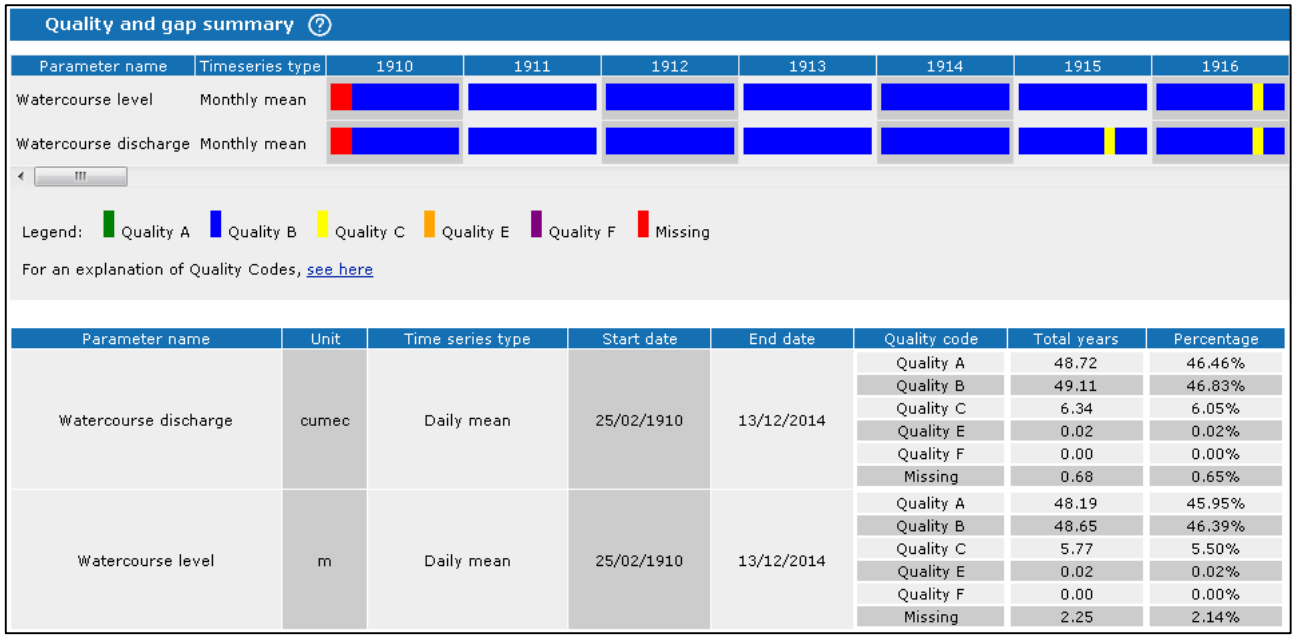


The selectable reports are parameter-based and customise for the individual parameters. For WaterCourse discharge and WaterCourse level the following reports are available over WDO:

- **Period of record summary** (A summary table which shows the date ranges of the recorded data and general statistics.)

Parameter	Water Course Discharge	Water Course Level
Unit	cumec	m
Start date	26 Feb 1910	26 Feb 1910
End date	19 Jul 2015	19 Jul 2015
Number of years	105.47	105.47
Number of values	285958	288366
Max value	580.71	4.42
Mean value	3.68	0.37
Min value	0	-0.23

- **Quality and gap summary** (A breakdown of the data into data quality codes. The coloured quality bars are using monthly mean time series. The table is using daily mean time series.)



Parameter name	Unit	Time series type	Start date	End date	Quality code	Total years	Percentage
Watercourse discharge	cumec	Daily mean	25/02/1910	13/12/2014	Quality A	48.72	46.46%
					Quality B	49.11	46.83%
					Quality C	6.34	6.05%
					Quality E	0.02	0.02%
					Quality F	0.00	0.00%
					Missing	0.68	0.65%
Watercourse level	m	Daily mean	25/02/1910	13/12/2014	Quality A	48.19	45.95%
					Quality B	48.65	46.39%
					Quality C	5.77	5.50%
					Quality E	0.02	0.02%
					Quality F	0.00	0.00%
					Missing	2.25	2.14%

- **Daily data summary** (A table showing the daily mean, daily minimum and daily maximum values for a selected month and year.)

Select month: Jul-2015

Date	Parameter	Unit	Mean	Min	Max
1 July 2015	Watercourse discharge	cumec	0.455	0.445	0.489
2 July 2015	Watercourse discharge	cumec	0.445	0.439	0.451
3 July 2015	Watercourse discharge	cumec	0.451	0.439	0.457
4 July 2015	Watercourse discharge	cumec	0.451	0.439	0.457
5 July 2015	Watercourse discharge	cumec	0.454	0.445	0.457
6 July 2015	Watercourse discharge	cumec	0.450	0.439	0.457
7 July 2015	Watercourse discharge	cumec	0.447	0.439	0.457
8 July 2015	Watercourse discharge	cumec	0.446	0.439	0.457
9 July 2015	Watercourse discharge	cumec	0.446	0.439	0.451
10 July 2015	Watercourse discharge	cumec	0.452	0.445	0.489
11 July 2015	Watercourse discharge	cumec	0.452	0.445	0.496
12 July 2015	Watercourse discharge	cumec	0.449	0.445	0.457
13 July 2015	Watercourse discharge	cumec	0.453	0.445	0.464
14 July 2015	Watercourse discharge	cumec	0.454	0.445	0.464
15 July 2015	Watercourse discharge	cumec	0.454	0.451	0.470
16 July 2015	Watercourse discharge	cumec	0.451	0.439	0.477
17 July 2015	Watercourse discharge	cumec	0.446	0.445	0.457
18 July 2015	Watercourse discharge	cumec	0.449	0.445	0.457
19 July 2015	Watercourse discharge	cumec	0.447	0.439	0.457
20 July 2015	Watercourse discharge	cumec		0.445	0.445
21 July 2015	Watercourse discharge	cumec			

- **Monthly data summary** (A table showing the daily mean values for the selected year. The summary table at the bottom of this report shows the mean of the daily mean values, minimum daily mean value and maximum daily mean value for each month of the selected year.)

Day	Unit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	cumec	0.255	0.428	0.430	0.493	0.443	0.409	0.459	0.444	0.468	0.564	0.451	0.449
2	cumec	0.404	0.404	0.423	0.497	0.442	0.427	0.451	0.450	0.470	0.569	0.466	0.449
3	cumec	0.832	0.332	0.425	0.514	0.446	0.443	0.450	0.451	0.474	1.302	0.470	0.456
4	cumec	0.613	0.332	0.438	0.575	0.440	0.448	0.468	0.450	0.486	4.234	0.467	0.461
5	cumec	0.467	0.361	0.413	0.545	0.443	0.448	0.434	0.446	0.492	5.132	0.464	0.456
6	cumec	0.440	0.452	0.464	0.549	0.443	0.447	0.446	0.442	0.498	3.086	0.462	0.487
7	cumec	0.471	0.498	0.560	0.540	0.444	0.358	0.443	0.444	0.499	3.089	0.463	0.464
8	cumec	0.430	0.541	0.566	0.536	0.448	0.446	0.444	0.443	0.508	3.088	0.483	0.458
9	cumec	0.483	0.521	0.558	0.538	0.447	0.446	0.443	0.445	0.513	3.094	0.499	0.457
10	cumec	0.610	0.451	0.568	0.548	0.440	0.422	0.442	0.443	0.535	4.288	0.473	0.463
11	cumec	0.574	0.454	0.565	0.543	0.440	0.446	0.439	0.449	0.528	6.453	0.474	0.465
12	cumec	0.466	0.459	0.567	0.542	1.280	0.445	0.441	0.441	0.548	6.002	0.473	0.467
13	cumec	0.433	0.462	0.580	0.542	0.446	0.446	0.452	0.434	0.562	0.969	0.473	0.470
14	cumec	0.473	0.452	0.584	0.537	0.453	0.447	0.436	0.441	0.650	0.415	0.474	-
15	cumec	0.433	0.459	0.585	0.530	0.439	0.451	0.799	0.441	0.710	0.398	0.477	-
16	cumec	0.436	0.471	0.563	0.526	0.455	0.453	1.013	0.446	0.958	0.396	0.485	-
17	cumec	0.433	0.442	0.525	0.522	0.461	0.446	0.801	0.460	0.939	0.396	0.467	-
18	cumec	0.419	0.437	0.522	0.523	0.462	0.447	0.694	0.456	0.605	0.394	0.467	-
19	cumec	0.415	0.510	0.524	0.521	0.488	0.447	0.696	0.456	0.606	0.395	0.469	-
20	cumec	0.410	0.439	0.498	0.517	0.464	0.444	0.699	0.461	0.607	0.394	0.464	-
21	cumec	0.398	0.439	0.502	0.527	0.463	0.446	0.700	0.463	0.603	0.411	0.460	-
22	cumec	0.392	0.434	0.471	0.515	0.462	0.445	0.569	0.460	0.736	0.422	0.463	-
23	cumec	0.398	0.427	0.470	0.539	0.460	0.449	0.443	0.464	0.662	0.437	0.460	-
24	cumec	0.400	0.421	0.473	0.478	0.462	0.468	0.442	0.463	0.581	0.427	0.465	-
25	cumec	0.394	0.351	0.464	0.448	0.464	0.459	0.442	0.472	0.612	0.437	4.680	-
26	cumec	0.368	0.299	0.905	0.440	0.460	0.450	0.444	0.467	0.537	0.431	1.532	-
27	cumec	0.368	0.367	0.829	0.443	0.572	0.443	0.444	0.472	0.526	0.497	0.464	-
28	cumec	0.939	0.430	0.530	0.445	0.598	0.449	0.443	0.479	0.393	0.534	0.462	-
29	cumec	0.960		0.458	0.443	0.413	0.453	0.439	0.483	0.551	0.454	0.460	-
30	cumec	0.497		0.465	0.442	0.417	0.458	0.438	0.480	0.557	0.453	0.452	-
31	cumec	0.419		0.490		0.412		0.438	0.472		0.450		-
Mean of all daily means		0.485	0.431	0.530	0.512	0.484	0.443	0.522	0.455	0.580	1.600	0.644	0.462
Maximum of all daily means		0.960	0.541	0.905	0.575	1.280	0.468	1.013	0.483	0.958	6.453	4.680	0.487
Minimum of all daily means		0.255	0.299	0.413	0.440	0.412	0.358	0.434	0.434	0.393	0.394	0.451	0.449

- **Yearly data summary**
  - WaterCourse discharge (A table showing the yearly total discharge volume in Megalitres. The total discharge volume is the total volume of water that has flowed passed the monitoring station for a particular year. The 'Missing days' column displays the number of days for each year that no data was recorded. The summary table at the bottom of this report shows the mean of all yearly discharge volumes, the minimum yearly discharge volume and the maximum yearly discharge volume.)

2006	Water Course Discharge	Ml	12,102.805	0
2007	Water Course Discharge	Ml	3,722.899	0
2008	Water Course Discharge	Ml	4,470.274	0
2009	Water Course Discharge	Ml	2,930.532	0
2010	Water Course Discharge	Ml	202,087.309	14
2011	Water Course Discharge	Ml	98,561.771	0
2012	Water Course Discharge	Ml	205,292.621	25
2013	Water Course Discharge	Ml	16,925.266	32
2014	Water Course Discharge	Ml	18,836.859	0
2015	Water Course Discharge	Ml	-	165

Mean of all yearly totals	117,716.289
Minimum yearly total	2,926.512
Maximum yearly total	584,012.977

  - WaterCourse level (A table showing the yearly mean, instantaneous minimum and instantaneous maximum for each year. The 'Missing days' column displays the number of days for each year that no data was recorded. The summary table at the bottom of this report shows the mean of all yearly means as well as the minimum yearly mean and maximum yearly mean.)

Year	Parameter	Unit	Minimum	Mean	Maximum	Missing days
1910	Water Course Level	m	0.171	0.452	0.927	57
1911	Water Course Level	m	0.202	0.533	1.166	7
1912	Water Course Level	m	0.075	0.407	1.879	2
1913	Water Course Level	m	0.091	0.392	0.899	1
1914	Water Course Level	m	0.046	0.239	0.843	1
1915	Water Course Level	m	0.042	0.420	4.352	4
1916	Water Course Level	m	0.122	0.599	1.520	3
1917	Water Course Level	m	0.304	0.797	1.977	1
1918	Water Course Level	m	0.006	0.552	1.463	3
1919	Water Course Level	m	0.024	0.306	0.771	33
1920	Water Course Level	m	0.156	0.488	1.100	5
1921	Water Course Level	m	0.148	0.605	2.644	3
2009	Water Course Level	m	0.032	0.090	0.385	6
2010	Water Course Level	m	0.006	0.433	2.614	21
2011	Water Course Level	m	0.049	0.454	1.313	7
2012	Water Course Level	m	0.015	0.527	3.426	1
2013	Water Course Level	m	0.011	0.239	0.938	1
2014	Water Course Level	m	0.080	0.239	0.934	0
2015	Water Course Level	m	0.107	0.228	0.405	165

Mean of all yearly means	0.375
Minimum of all yearly means	0.073
Maximum of all yearly means	0.797

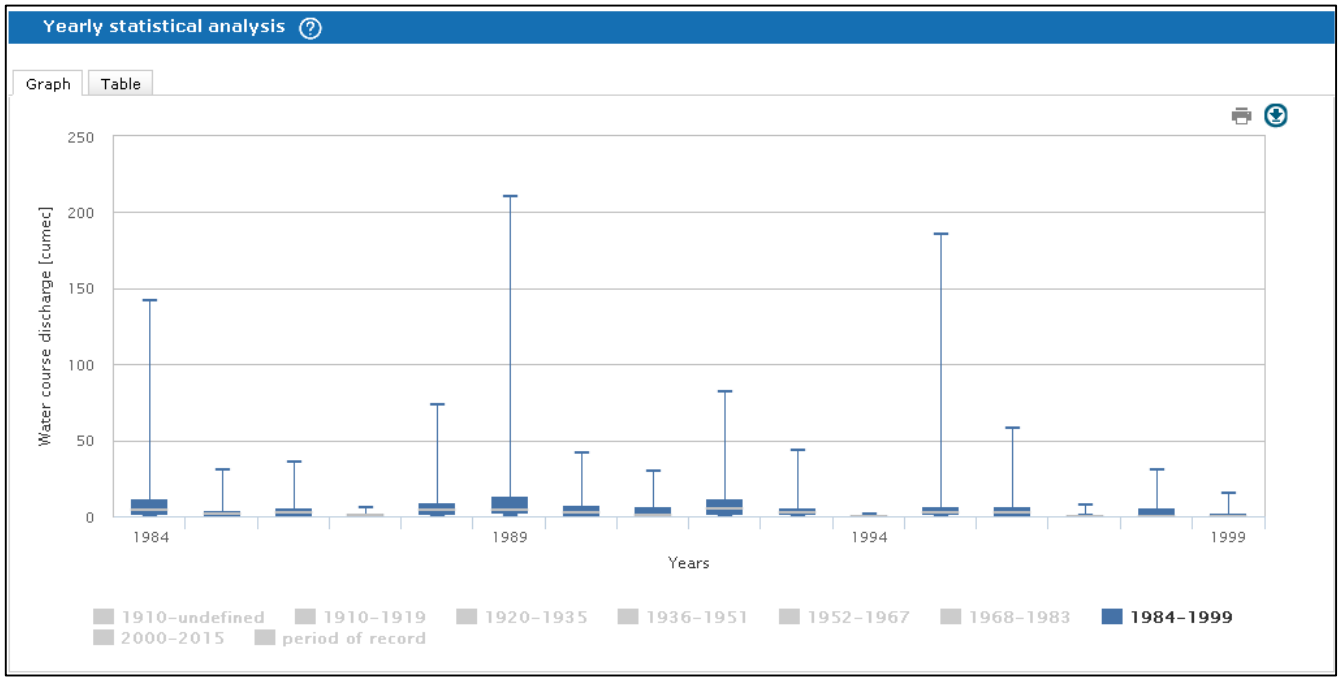
- **Monthly mean statistical analysis** (A graph and table showing historical statistics per month. Each individual 'box whisker' graph shows the maximum (top blue line), 75th percentile (top of solid blue bar), mean (grey line inside solid blue bar), 25th percentile (bottom of solid blue bar) and minimum (bottom blue line) calculated from the full period of record for that particular month. These statistical values can be seen in the table below or by hovering the mouse pointer over the box whisker graphs. The red dots show the monthly mean values for the year that have been selected. You can compare the monthly mean (red dot) for a given month and year with the historical statistics (box whisker) of the station.)

Graph | Table

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum Year	1968	1973	1968	1968	1968	1965	1968	1976	2007	1982	1967	1967
Minimum monthly mean	0	0	0	0	0.001	0.002	0	0.033	0.047	0.071	0.009	0
25%	0.192	0.148	0.178	0.269	0.341	0.491	1.117	1.679	2.417	1.6	1.026	0.531
Median	0.662	0.462	0.542	0.593	0.846	1.472	2.757	4.582	5.467	3.765	2.302	1.458
75%	1.851	1.271	1.374	1.235	1.963	3.279	7.999	8.691	9.537	8.363	6.59	2.342
Maximum monthly mean	26.221	16.435	44.287	30.701	33.479	43.592	34.982	30.212	46.171	44.587	35.042	29.707
Maximum Year	1984	1971	2012	1989	1956	1956	1922	1939	1915	1917	1917	2010

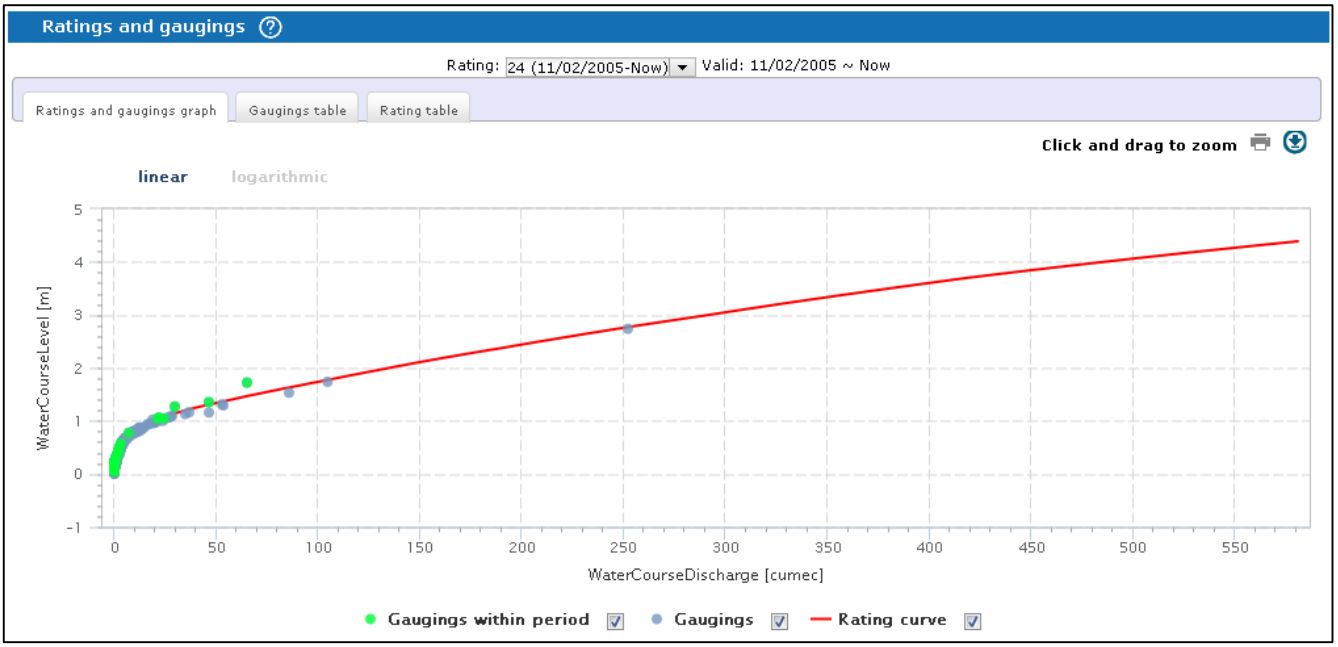
- **Yearly statistical analysis** (A graph and table showing historical statistics per year. Each individual 'box whisker' graph shows:
  - Instantaneous maximum (top blue line)
  - 75th percentile (top of solid blue bar)
  - Median (grey line inside solid blue bar)
  - 25th percentile (bottom of solid blue bar)
  - Instantaneous minimum (bottom blue line)

  These statistical values can be seen by hovering the mouse pointer over the box wisker graphs or in the table tab. All values in this report are calculated from a continuous time series.)

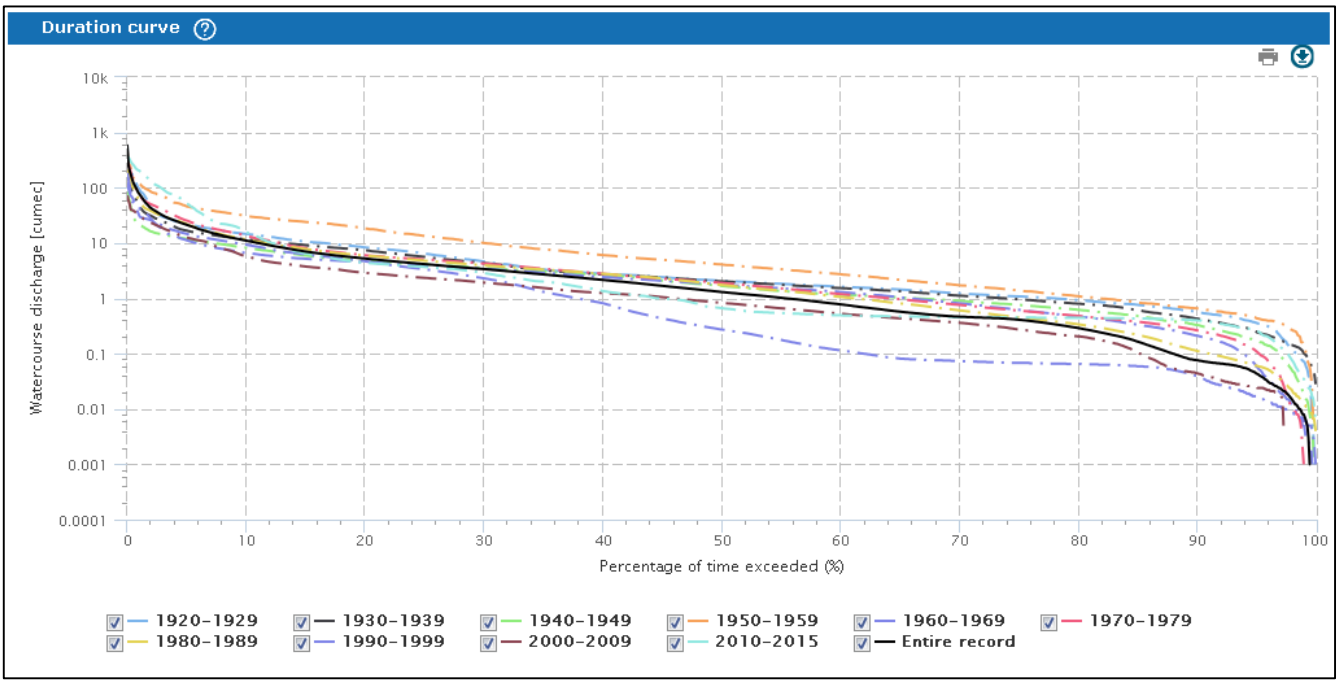


2004	0.069	0.433	0.663	1.512	14.467
2005	0.062	0.447	1.488	3.280	22.028
2006	0.004	0.214	0.346	0.731	2.519
2007	0.013	0.035	0.056	0.201	5.850
2008	0.011	0.029	0.068	0.240	2.257
2009	0.007	0.031	0.047	0.198	1.787
2010	0	0.870	9.612	40.575	226.435
2011	0.016	1.191	1.991	4.150	46.730
2012	0.002	2.004	3.683	5.175	366.153
2013	0.001	0.416	0.470	0.524	15.017
2014	0.047	0.439	0.464	0.534	14.795
2015	0.087	0.439	0.451	0.464	1.758

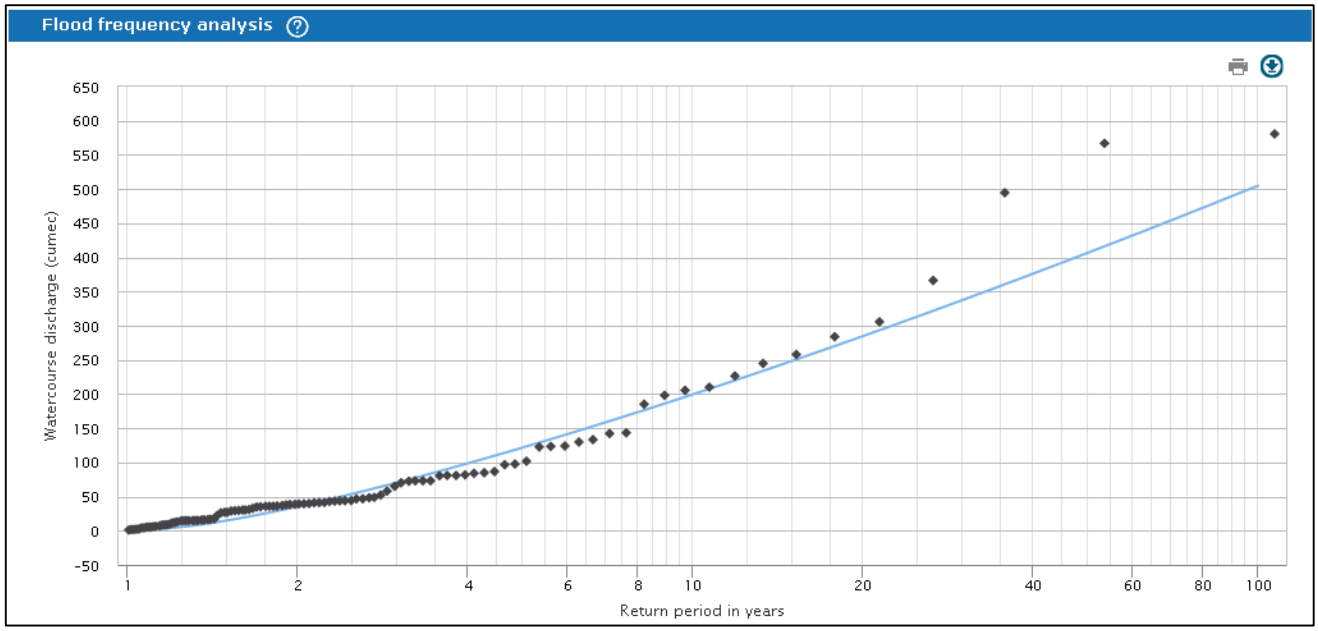
- **Ratings and gaugings** (A graph of the ratings used to convert watercourse level to watercourse discharge. Gaugings are plotted on the rating graph and are also displayed under the 'Gaugings table' tab.)



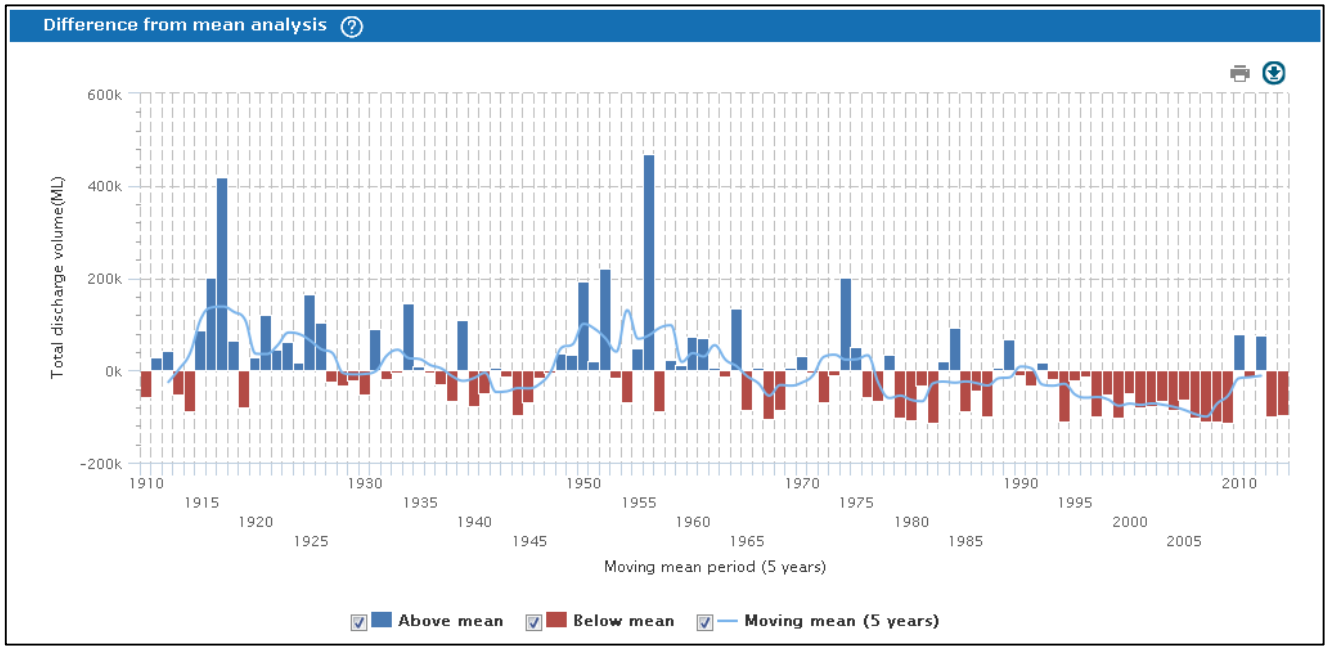
- **Duration curve** (A graph showing the percentage of time during which watercourse discharge exceeds a certain value. The duration curve is calculated using the entire data record. There are also duration curves which have been calculated using 10 year periods which show how the exceedance probabilities have changed over time. These can be turned off and on using the tickboxes in the legend.)



- **Flood frequency analysis** (A graph showing the recurrence interval of watercourse discharge values. The recurrence interval is an estimate of the likelihood of an event such as a flood discharge occurring. The frequency analysis (blue line) is calculated from the continuous data using a 'Pearson 3' distribution. The plotting position used is 'Weibull'. The black dots are representative of the highest value for each year of record.)



- **Difference from mean analysis** (A graph showing the differences between the yearly mean for a specific year and the yearly mean over the period of record. This report also includes a 5 year moving mean line which is a recalculation of the mean using a 5 year subset of the data. The 5 year moving mean plots midway through the 5 year period e.g. the moving mean from 1995 to 2000 plots in 1997.)



Water Data Online is designed as open system and will be enhanced with additional parameters and reports over time.

Modelling in the KISTERS Framework

A number of users are still running the old TimeStudio modelling program, rebadged some years ago as KISTERS Modelling. A lot of things are happening in the modelling world nowadays. To open it up for our users, a decision has been made to integrate the KISTERS modelling into the KALYPSO modelling system and move the support and consulting to our partner BCE (Björnsen Consulting Engineers), a renowned consulting firm in water modelling and developer of the KALYPSO system. Kalypso https://en.wikipedia.org/wiki/Kalypso_(software) or http://kalypso.bjoernsen.de/index.php?id=254&L=1 itself

is open source and provides a number of modelling options. However existing KISTERS Modelling users need not be alarmed, as their software will continue to run indefinitely. It runs under all modern versions of Windows, and we are confident it will continue to run under Windows 10. It has proved remarkably reliable, with little need for patches or enhancements over the past decade.

When it comes time to redevelop systems based on KISTERS Modelling there are a number of options available to users besides Kalypso. Hydstra users could consider MODSYN, which has been used in complex computations such as dam inflow modelling and other applications. Of course both WISKI and Hydstra have been interfaced to many other products, including Delft-FEWS as well as locally developed models of many sorts. WISKI and Hydstra offer many interface techniques ranging from text files to REST interfaces for programmatic linkages.

If you are a current user of KISTERS modelling we are keen to hear from you as to the nature of your application. We can work with you to consider modelling strategies over the next few years.

KISTERS Training

Training Schedule for 2015

Stop Press – we still have places available for an Advanced Hydstra training course to be delivered on August 11/12. Topics to be covered include:

- *Site lists*
- *Variable Conversions*
- *Data Sources*
- *Document management*
- *Reviewing data*
- *Auditing data*
- *Managing Ratings*
- *Job Automation*
- *Perl*
- *Integrating Hydstra with other systems*
- *Bulk data changes*

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 the rest of 2015:

Course	Duration	Dates
Advanced Hydstra	2 days	11-12 August, 2015
Basic Hydstra	2 days	15-16 September, 2015

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. Training Courses may need to be withdrawn or postponed if there is not enough interest.

Training Courses

We are happy to provide training courses on any aspect of Hydstra 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. Training at

your office will be charged at our standard consulting rates per day for the trainer, plus a preparation day, plus travel and accommodation at cost. Courses we can offer include:

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

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

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

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

Denby Angus has relocated to Merimbula on the South Coast of NSW. He is operating from a home office there, but still working full time for KISTERS supporting our web offerings. You can contact him by phone on his direct number 02 8091 5212, email *denby.angus@kisters.com.au*.

Information

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