KISTERS Australia News

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From The GM's Desk

By Bill Steen, General Manager, KISTERS Pty Ltd

Welcome to this edition of the newsletter.

This year has started out with a huge interest in KISTERS water quality, biological and groundwater solutions. This appears to be a global trend, with interest coming not only from the Australasia region, but from around the globe.

The water industry does tend to move through cycles from surface water flow data collection, water quality and groundwater, as the needs on both a global and domestic scale fluctuate as a result of climate change.

The current push to understand what is going on in our environment with climate change has necessitated the need for more data covering all sciences within our industry. Governments are now investing more money into the effects of climate changes resulting in the need for better data.

Within Australia the Department of Environment is predicting that "*annual average temperature warming by 2030 (above 1990 temperatures) is around 1 degrees Celsius across Australia, with warming of 0.7 to 0.9 degrees Celsius in coastal areas and 1 to 1.2 degrees Celsius inland.*

By 2070 warming is expected to be between 2.2 to 5 degrees Celsius across Australia, depending on the emissions scenario.

Intense rainfall events in most locations are projected to become more extreme, driven by a warmer, wetter atmosphere".

With the above predictions it is a necessity to have your data in good order, quality checked, available and accessible by all end data users.

Enjoy the newsletter.

Bill Steen
General Manager

KISTERS Pty Ltd

Water Week in Aachen

In January this year nearly 60 staff from KISTERS offices all over the world convened in Aachen for a week of presentations, discussion, deliberations, and socialising. The sessions during the day ranged over marketing, development and consulting issues, with plenty of time for less formal proceedings in the evenings. Highlights included a spirited performance of the Haka from the New Zealand contingent. Peter Heweston's birthday fell during Water Week and the chefs at the KISTERS canteen created a splendidly patriotic (and delicious) birthday cake for the occasion!

Peter's birthday cake

Aachen winter street scene

KISTERS User Group Meetings 2016

Australian KISTERS User Group Meeting

The Australian KISTERS User Group meeting will be held this year on 24 October 2015 in Canberra at the Southern Cross Club in Woden in association with the AHA conference on October 25 and 26. Please contact Debbie Cockburn for more information at debbie.cockburn@kisters.com.au. Registration will be done in conjunction with the AHA conference, and the registration form should be available soon from http://aha.net.au/events/ .

US KISTERS User Group Meeting

The 2016 KISTERS Users Group meeting will take place on September 12-13 at the tried and true Bahia Resort Hotel in San Diego. Please contact Jennifer Durda for more information at jennifer.durda@kisters.net.

WISKI User Conference, Berlin, Germany

This year, the German and international WISKI users will meet on June 14 and 15 in the vibrant city centre of Berlin close to the famous Brandenburg Gate, the Reichstag and the former Checkpoint Charlie. Please contact Christina.Hensgens@kisters.de for more information at Christina.Hensgens@kisters.de.

Australian Groundwater School

By Damian Skinner

I recently participated in the Australian Groundwater School run by the National Centre for Groundwater Research and Training at Flinders University in Adelaide. The five-day course provided a 'broad but rigorous' introduction to groundwater, covering a range of topics, including:

- Hydrogeology
- Groundwater Hydraulics
- Groundwater Dependent Ecosystems
- Surface Water/Groundwater Interactions
- Managed Aquifer Recharge
- Modelling
- Drilling methods and Bore Design
- Groundwater Management Policy
- Groundwater Governance and Water Law

A mid-week field trip provided a welcome break to all the theory and helped with a practical understanding of groundwater issues. It was a very well run course presented by an array of groundwater experts across academia, government, industry and consultants and I'd certainly recommend it. It was also interesting to meet some of the next generation of Australia's groundwater managers.

You can read more about forthcoming activities organised by the National Centre for Groundwater Research at http://www.groundwater.com.au/ .

New Zealand Ratings Workshop

By Peter Heweston

I recently attended an excellent workshop in New Zealand run by the New Zealand Hydrological Society to discuss various aspects of the rating process. Attendees came from the USA, Canada, France, Australia and New Zealand, and for two days we pondered the meaning of life, the accuracy of gaugings, and how good were our ratings.

A quick flavour of the workshop can be gathered by looking at some of the session topics:

- An introduction to rating curve methodology around the globe, including background and current methods.
- Combining prior knowledge and calibration when creating rating curves
    - Approaches currently used; for example, to determine curve shape if insufficient gaugings (interpolation and extrapolation), and to allow for gauging uncertainty when curve fitting

    - What supplementary field data should be collected? Why, where, how, and how often? Examples: cross sections, photos, vegetation surveys, LIDAR
    - How should gauging uncertainty be incorporated into rating development? Must it be quantified, or is some ranking or quality code sufficient? How to account for undue bias from correlated errors among gaugings? Is there a need to develop and standardise the method for estimating or classifying gauging uncertainty?
- Assessing changes to the stage-discharge relation
    - What evidence is required to warrant a shift or change of rating curve?
    - What techniques are available for deciding the timing of these changes?
- Evaluating rating curve reliability
    - Quantitative methods – Determining uncertainty; a synopsis of current work in this area
    - Qualitative methods – Assessing trustworthiness; what aspects are important?
    - Is knowing the reliability of the rating(s) necessary to users of a flow record
    - What are the benefits of determining a numerical uncertainty versus assessing trustworthiness?
    - Are both these methods required to evaluate how well the rating describes the stage-discharge relation?
- Simple versus complex rating curves
    - What kinds of complexity are encountered? Backwater effects due to tide, gates, ice, dams, weed? Hysteresis (rating loops due to changing water surface slope as events pass through a channel controlled reach)? Others?
    - How common are loop ratings?
    - Most common and/or preferred means of dealing with the complexity?
    - Should developing complex ratings only be done by, or be guided by, an expert?
- What role should software play in choice and quality assurance of rating method? Should it lead or follow practice? Are there constraints created by software? Are those constraints, if any, desirable or detrimental? Should software be used as a means to achieve standardisation?
- The challenge of maintaining ratings in real-time
    - What concessions are acceptable when producing ratings for operational use?
    - How should changes to operational ratings be managed?
- Re-analysis of past ratings due to new information, new standards or new procedures
    - Should archived or published ratings be static (locked in time) or dynamic?
    - If locked, how should one deal with a rating known to be wrong
    - If dynamic, how should one deal with past analyses known to be wrong

The presentations and notes from the workshop are available at http://hydrologynz.org.nz/index.php/nzhs-events/nzhs-workshops/past-workshops

I rather suspect that a similar workshop held in Australia would be well attended.

A Backup Saga

We recently had a near-disaster in our Canberra office when several disks in a RAID constellation on our primary file server failed over time, unbeknown to us. It turns out that the RAID controller can be configured to send emails when it detects a single disk failure, but we had not configured this facility, so one, two, and finally three disks developed hardware problems, at which stage things started going badly wrong and files became unreadable.

Fortunately we had decent backups on tape, as well as a separate backup to another NAS disk subsystem. After a lot of work rebuilding the RAID drives and restoring from tape we finally staggered back into life.

The moral of the story is that you can't have too many backups, and you need to regularly check your system logs and backup logs for signs of impending hardware failure.

We have previously been hit by a ransomware virus which started working through our file base encrypting files. Fortunately we had good offline backups and were able to recover with no data loss and without paying a ransom. As mentioned increasingly in the technical news, some organisations have had no alternative but to pay a hefty ransom to recover their files.

The number of ransomware attacks is on the rise, and authorities estimate that the ransomware business will be worth hundreds of millions of dollars in 2016, and business is growing rapidly.

We recommend to Hydstra users that they back up their data regularly on to read-only media such as DVD, Blu-Ray disk or USB disk. The same advice obviously applies at home – don't put your precious family photos at risk by failing to make regular backups.

Don't leave your backup hard drives attached at all times, as a ransomware virus will see the drive and encrypt that as well given half a chance. And don't have just one backup, as you risk overwriting your one good backup with encrypted or damaged versions of files and losing everything.

Hydstra Product News

Hydstra V11 Release

Hydstra Version 11 is the current supported stable version of Hydstra, 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 upgrade to it. We suggest you do a trial upgrade on a copy of your 10.04 system first, before going live.

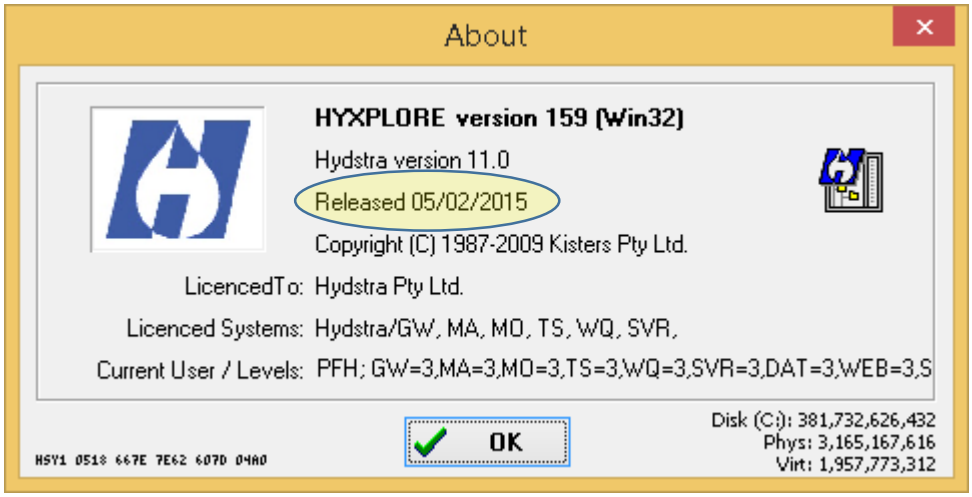
If you work closely with other agencies and trade Hydstra data with them you should liaise with them before upgrading. If you run Hydstra/WEB you should liaise with Denby Angus and set up a test V11 web server.

Patching Hydstra 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.

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.

You can find out the date of your current patch by running Help/About from HYXPLORE:



The Released date is the date the system was compiled, prior to being tested and packaged up into a patch.

HYXPLORE will check if you have run HYPATCHUP and nag you about it you haven't.

We recommend that you patch your system at least once every few months, as many new features are being continuously released through patches now.

Hydstra User Survey

We recently sent out a survey to the nominated system administrator of every Hydstra user agency. If you did not receive the survey, or couldn't download it from

https://www.dropbox.com/s/wdie7tw9svk92kx/2016%20Hydstra%20Usage%20Survey.zip?dl=0 , please email Peter Heweston and request a copy of the survey in zip form.

We would appreciate it if every Hydstra agency could complete the survey and return it to peter.heweston@kisters.com.au. We will publish a summary of the findings at the forthcoming KISTERS User Group meetings later in the year. In particular the survey lets us know which parts of Hydstra are important to our user base, and which are seldom or never used.

Deletion Candidates in Hydstra V12

As part of our ongoing campaign to remove unused code in Hydstra we have identified a few potential candidates already. Please let us know as soon as possible if you still use any of the following programs or database tables:

- HYMIN.EXE and the Mindata tables MINLOG and MINVAR.
- HYM2000.EXE and the Mace tables MACELOG, MACECHAN, MACEREG and MACEGAUG
- The AWRCREP manage and associated code.

The best way to ensure that important programs don't come up as deletion candidates is for you to complete the Hydstra User Survey which we circulated recently See above for details on how to download the survey if you didn't receive it.

Is Anyone Using Ploticus?

For some years we have been delivering a third-party command-line plotting tool called Ploticus with Hydstra. If nobody is using it we would like to remove it from V12. Please let us know if you still want Ploticus to be distributed with Hydstra.

If you need to produce ad-hoc plots a number of users have found that the R statistics package provides a powerful plotting and reporting toolkit. See https://www.r-project.org/ for more information on R.

HYWDTF_OUT Data Volume Reduction

We have been working with the Bureau of Meteorology to try and reduce the amount of repeated WDTF data being sent to them daily. We have delivered version 47 of HYWDTF_OUT.HSC in the latest V11 patch which retains a cache file for each site/variable/datasource containing the latest block in JSON format.

If the only changes to the variable since yesterday consist of adding more points to the end of the last block then only the new points are sent, and not the whole block. This can reduce the average block length being sent from 1500 points to more like 100 for 15 minute data.

Changes to any previous blocks will cause a full block re-transmission as before.

Hydstra/WEB Performance Enhancements

Many aspects of the architecture and functioning of the Hydstra web portal have been enhanced to greatly reduce portal startup time and significantly improve tab page loading performance. This includes the pre-caching of many standard pages and data caches by WEBBUILDER using HTML and JSON cache files. The function of WEBBATLS.EXE in generating XML data for sites within the web portal has been replaced by Perl code utilising cached data and DLL JSONCall requests.

These changes do not require any web portal customisation since all changes are within core code and will automatically be implemented when you upgrade to v11 or apply the latest v11 patch.

Printing to PDF

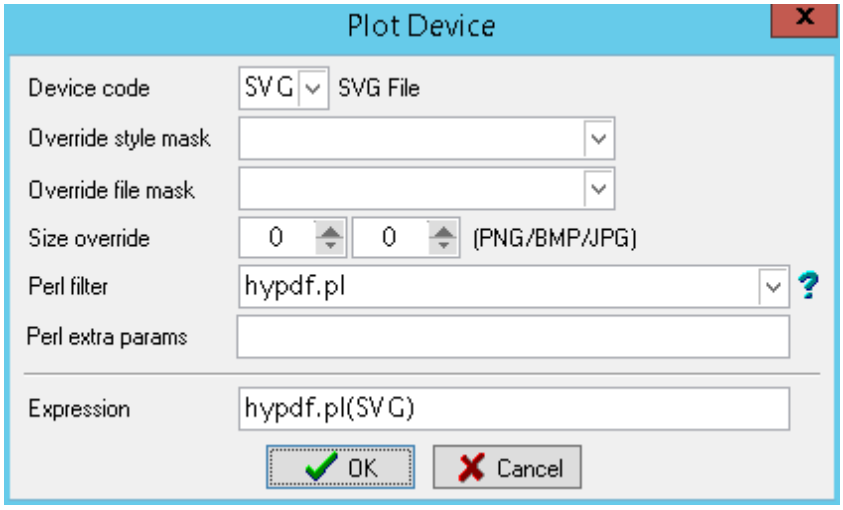
We have enhanced your ability to print to PDF from Hydstra programs using the HYPDF.PL post-processor. You require an entry in LISTDEV.INI of

```
PDF = hypdf.pl({TEMPFILE.PDF})/S  Convert to PDF and Display
```

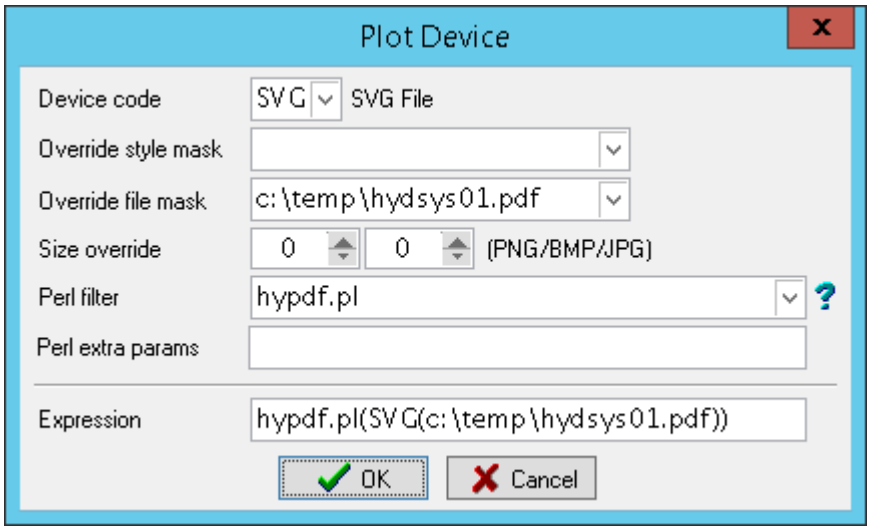
if you don't have it already – it is in the latest patch in MISCPATH.

You can print text reports and HTML reports built with HYTABLE.PM by directing them to the PDF print driver.

To send a plot to PDF you need to use the advanced options in the plot destination to specify something like:



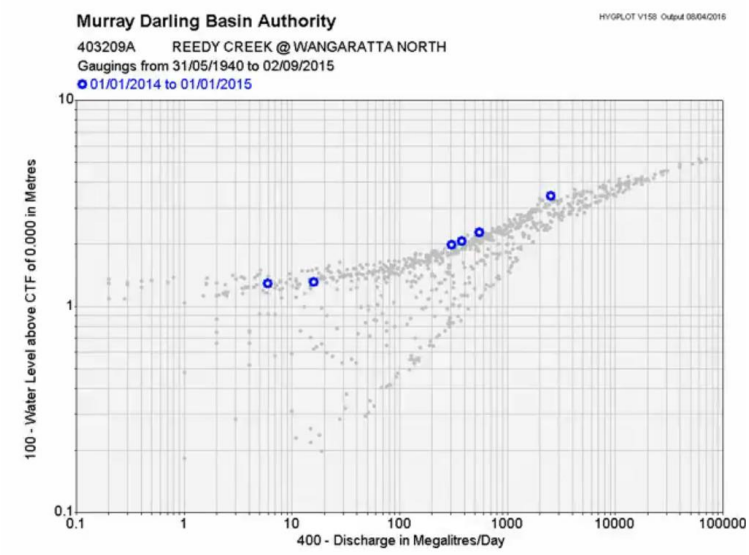
If you wish you can specify the file name of the resulting plot:



You will require a patch dated 04/03/2016 or later to use this feature.

Animating Hydstra Plots

We recently wanted to produce an animated plot of gaugings over time. We cobbled together something using a specially patched version of HYGPLOT, together with the use of an Image Magick tool CONVERT.EXE to convert a series of PNG files into a movie. The results are quite interesting, and if there is sufficient interest I imagine we could bundle the process into something more automated.



You can see an example in action at

https://www.dropbox.com/s/b8dcuuvpmrequxr/hygplotmovie_MDB_403209a_log.mp4?dl=0

Using Automation Files from Perl

We recently developed and patched to V11 a powerful new way of providing parameters to Hydstra programs via automation files (.AUT extension). An automation file is a JSON file containing everything needed to run a program. In particular, within a single automation file you can do the following:

- Provide command line parameters to a program
- Provide command line switches to the program (e.g. /hide)
- Temporarily override HYCONFIG settings
- Temporarily make INI file overrides, with convenient ways of adding/deleting/replacing sections and keywords

Automation files are ideal for use with Perl, since there is a direct and simple mapping between a Perl hash and a JSON file. A Perl snippet from the project to create movies with HYGPLOT is as follows:

```
      my %p;
      $p{program}='hygplot';
      $p{version}=1;

      # command line options - an array of strings
      $p{command_options}=['/pfh_hack','/e=hyconf=abortw;f','/hide'];

      # parameters - an array of strings, each string a "line"
      $p{param_lines}=[
        "$site $C{'perl_parameters'}{'vfr'} $C{'perl_parameters'}{'vto'} 01/01/1900 01/01/1900 -1
$C{'perl_parameters'}{'sca'} $C{'perl_parameters'}{'dev'} $C{'perl_parameters'}{'125'}
$C{'perl_parameters'}{'del'} $C{'perl_parameters'}{'pag'} $C{'perl_parameters'}{'per'}
$C{'perl_parameters'}{'iso'} $C{'perl_parameters'}{'lab'} $C{'perl_parameters'}{'dat'}
$C{'perl_parameters'}{'clb'}\n$C{'perl_parameters'}{'smi'} $C{'perl_parameters'}{'sma'}",
        "01/01/$i 01/01/$lastyear 01/01/2100 01/01/2100 01/01/2100"
        ];

      push (@{$p{ini_files}},{
        # each item in the list is a hash with a single item, the name of which is the INI file
        'wip.ini'=>[
          # within each INI file, we have an array of inifile sections
          {"[Default Colours]"=>[
                {Default  => 'Black'},
                {Trace1   => 'silver'},
                {Trace2   => 'blue'},
                {Trace3   => 'silver'},
                {Trace4   => 'Magenta'},
                {Trace5   => 'Maroon'},
                {Trace6   => '$FFA0A0'},
                {Trace7   => 'Orange'},
                {Trace8   => 'Olive'},
                {GridLines=> 'LIGHTGRAY'},
            ]
          },
          {"[Default Traces]"=>[
             {Symbol1 => 'Circle'},
             {Symbol2 => 'Circle'},
             {Symbol3 => 'Circle'},
             {MediumSymbol  =>  '30, TenthMM_A4, 12'},
             {SmallSymbol  =>  '15, TenthMM_A4, 4'},
            ]
          },
          ]
        });

      my $autfile=HyconfigValue('JUNKPATH').'hygplotmovie.aut';
      HashRefToJSONFile(\%p,$autfile);

      #now we will run HYPLOT using the JSON file as the only parameter
      PrintAndRun('-RS',"hygplot \@$autfile\n");
```

You will need a patched V11 after 03/05/2016 to make use of .AUT files and have the documentation included. The code has been available since 20/04/2015 but the documentation was only patched recently.

Backup Backup Backup

Without banging on too much about backups, from the survey responses already in we see than most Hydstra users don't make regular DVD or USB copies of their Hydstra system *which are kept forever*. Just recently we have been dealing with a client who lost a lot of entries from their VARIABLE table at some time in the past, and they have no easy way of going back far enough to recover the loss, or even find out when it happened.

If you are using SQL Server to hold your metadata we strongly recommend you copy the tables out to Foxpro every night in AUTOJOB. It's a simple one-liner to do this, and it can save lots of grief recovering missing database data later. The following batch job exports tables to Foxpro except JOURNAL and DBFLOG, both of which can get huge and aren't really needed for backup purposes:

```
@rem Export SQL database tables to Foxpro DBF in \hyd\dat\dbf
@rem need to be a bit cunning about excluding JOURNAL and DBFLOG which can get huge
@rem takes a destination report file name as its parameter
@echo off
echo on
if "%1"=="" (
  echo *** ERROR - SQLTODBF run with no report file parameter
  kbto 10
  goto :EOF
)
hystns table(mastdoc,dbname) n %junkpath%dblist.txt
gnuegrep -v "JOURNAL|DBFLOG" <%junkpath%dblist.txt >%junkpath%dblist1.txt
perl -e "use File::Slurp;$files=read_file('%junkpath%dblist1.txt');$files=~s{\n}{,}g;$files=~s{\s+}{}g;chop
$files;write_file('%junkpath%dblist2.txt',$files)"
for /f %%f in (%junkpath%dblist2.txt) do set tablelist=%%f
hydbutil copy %tablelist% %dbfpath% %1
```

And then in AUTOJOB:

```
call :runjob SQLTODBF "call sqltodbf.bat %repdir%sqltodbf.txt"
```

If you're not worried about the size of DBFLOG and JOURNAL then you can copy your whole system in one line of AUTOJOB:

```
call :runjob SQLTODBF "hydbutil copy * %dbfpath% %repdir%sqltodbf.txt"
```

If you have the space to keep seven copies you can keep a rolling 7-day cycle in AUTOJOB with:

```
call :runjob SQLTODBF "hydbutil copy * %dbfpath%%dow%\ %repdir%sqltodbf.txt"
```

The copy make take several hours on a big system, but it's definitely worth doing. Having these backups makes recovery from those inevitable 'oops' moments much easier than having to go cap in hand to IT and beg for a database recovery from backup tapes.

These days you can buy 8GB flash drives in bulk for a few dollars each. Make a monthly copy of your important Hydstra files to a flash drive, put it in an envelope, label it, put it away, and keep it forever. it's a very cheap insurance policy.

WISKI Product News

Release Management

WISKI, KiWQM and KiECO customers in Australia, NZ and South-East Asia are using WISKI 7.4.1 or 7.4.3 in production. We will be introducing the 7.4.5 release beginning mid-2016. The 7.4.5 versions sees major functional developments on the client and server side from migration projects in Europe like the Environmental Agency in England and some German state governments. On the water quality side many enhancements are in 7.4.5 due to developments of the Swiss Environmental Agency and the Global Water Quality Database GEMStat and KiECO experienced a major development boost due to ecological data management in Wales. Some concepts and features will be introduced from this newsletter onwards.

Support Email, Help Desk and Bugzilla

The WISKI team at KISTERS Pty Ltd (Vicky, Chris, Markus 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, Markus 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.

New WISKI Download Portal

A new download portal has been created for WISKI software. This allows us to distribute new releases from one central location and will significantly enhance our customers' ability to access the latest releases quickly, when they are desired. 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.

Selected features in version 7.4.5

The WISKI 7.4.5 version introduces on the WISKI server side new concepts and functions to enhance the usability of reports, increase the performance of the calculation processes and search mechanisms and will introduce a new authentication concept with OpenID across all KISTERS modules.

- Reports in WISKI: The existing report explorer is in 7.4.5 replaced with a report wizard. The wizard supports (as all existing wizard operations) filter methods for all instances, can be run for selections of parameters, stations and groups and stores the configuration as named configuration. The configured reports can be rerun at any point in time from WISKI or as a scheduled operation from KiDSM. Additionally the reports will no longer require a Crystal report installation and will be published directly as pdf. The new report API will assure that all existing client reports are compatible.
- Performance calculations and meta data queries: The performance within the WISKI 7.4 line is further improved in 7.4.5 while experiencing some performance reductions in releases before. The performance was already increased for the marking of dependent time series and is further increased in 7.4.5 for the pending calculation queue. Also a performance increase in the statistical wizards like the WQM statistics wizard is realised. With the growing demand on meta data and the search across meta data the WISKI server in 7.4.5 will include mechanisms based on elastic search to increase the query performance significantly.
- Authentication and security: The LDAP implementation is further improved and supports OpenID to allow connection to WISKI from other systems under the same windows user account implementing the full active directory functionality.

The WISKI 7.4.5 client development will introduce a new entity for station locations including additional attributes and enhancements for the csv importing framework. Also major rework was done for BIBER, the flow measurements management tool in WISKI. Key developments took place for KiWQM and KiECO (see mentioned projects above).

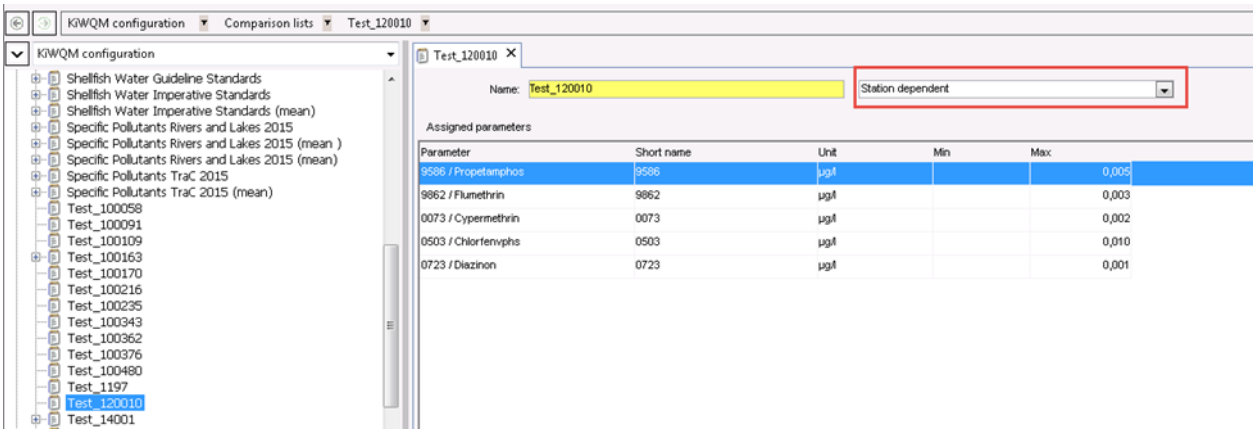
- Station locations: The WISKI 7.4.5 version allows the management of locations additional to the site and station hierarchy. For the new location attribute additional attributes and csv import options were implemented as well. This dedicated location entity allows for example to include bore holes and pipes into the site and station hierarchy and brings with them a flexible attribute system.
- BIBER calculations: The flow measurement management and analysis (BIBER) is enhanced in WISKI 7.4.5 due to the requirements of the Swiss Environmental Agency. The enhancements include the complete integration of their legacy system for hydrometric data measurement. The enhancements include an algorithm to estimate bottom velocity, the extension of the BIBER csv import by verticals and observations, the import of the ADCP

Sontek Stationary format, storing the state variation as in dependent property and a Flowtracker JSON import format.

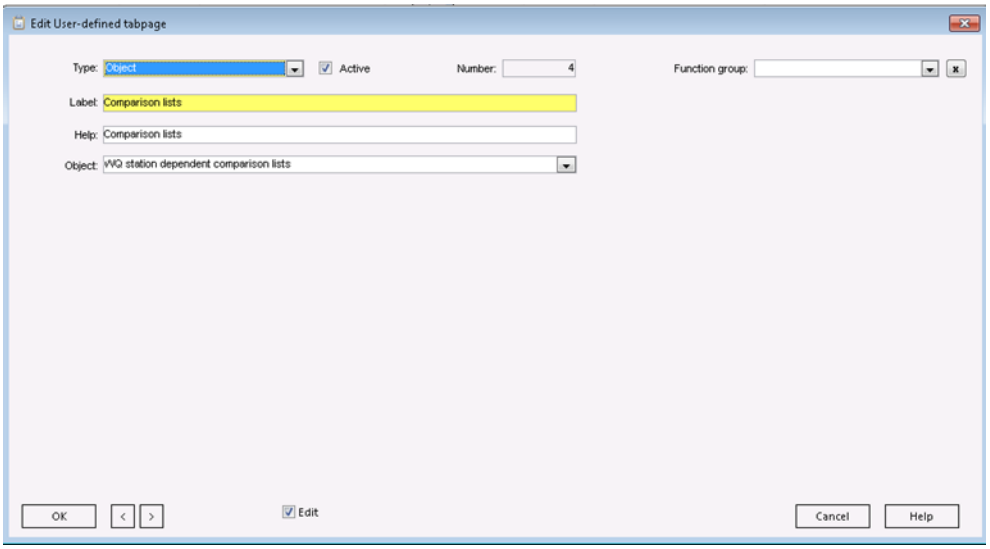
- Station dependent comparison lists: Comparison lists are used to define maximum and minimum threshold values for a range of sampling parameters. In this way comparison lists can be used to store important water quality threshold values such as the WHO drinking water guidelines and the ANZECC guidelines for fresh and marine water quality for example.

  Comparison lists can then be applied to the sample results to determine if a result falls above or below these threshold values. They are an extensively used tool within KiWQM such as plausibility checks and the statistics wizard and can be applied within the WISKI graph.

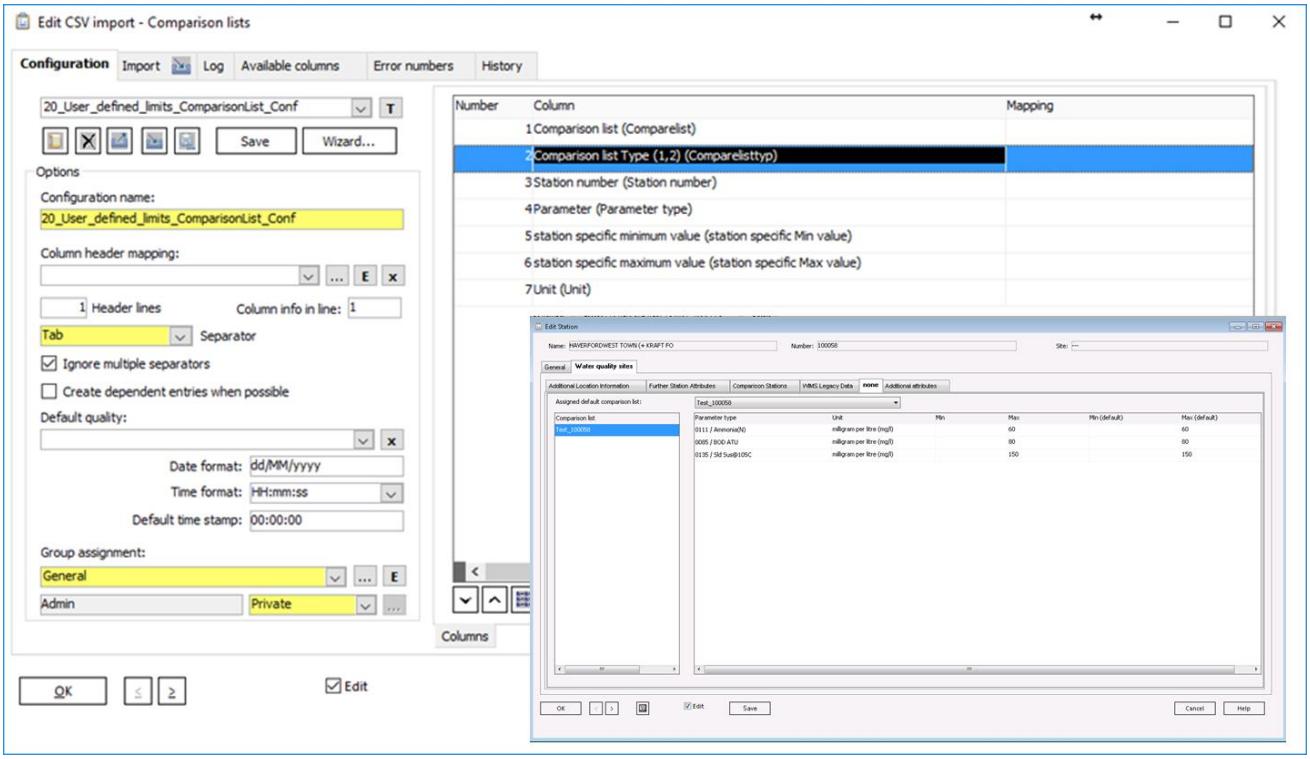
  The latest release of KiWQM (7.4.5) has extended this concept to allow for station specific comparison lists in order to maintain station specific limits. To configure a station dependent comparison list a comparison list as usual needs to be created – and indicated that it is station dependent as shown below:



Then an additional attribute called WQ_DEFAULT_COMP_LIST has to be created and added to the built in station tabpage 'WQ station dependent comparison lists' of the required station characteristic (e.g. water quality) as shown below:



To import a station dependent comparison list the csv exporter has to be extended with the ' Comparison list Type'. In the import the comparison list name has to be set to type = 2 (to indicate station dependent list) and the following colums have to be populated: station number, parameter type, station specific max, min values and the unit (see csv importer example below). Once imported the list will appear against the relevant water quality stations as result shown below.



The plausibility check will then evaluate the station dependent limits against the once defined.

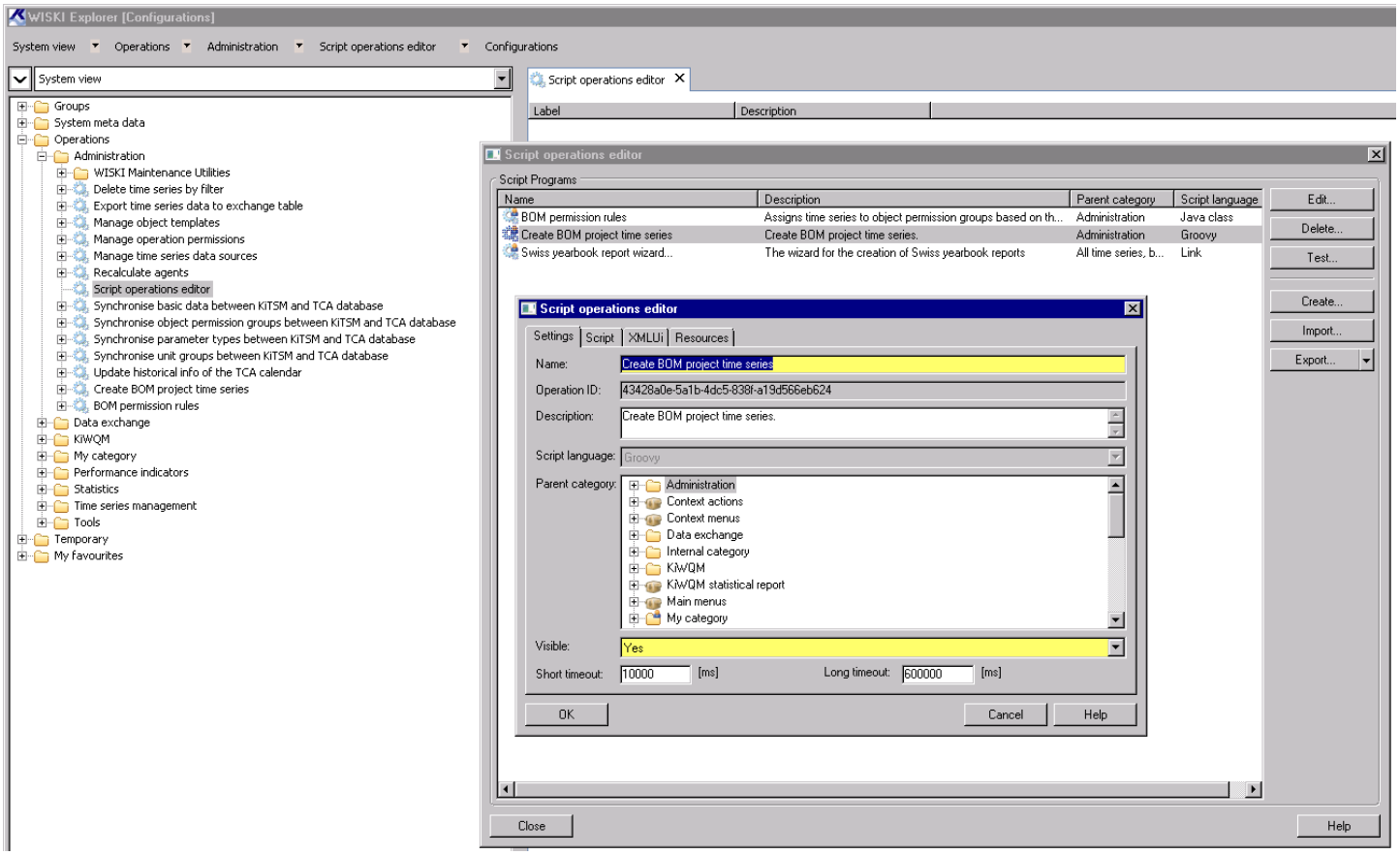
Project news: Project template operation to apply specific customer system configuration

For the BOM a project was carried out over the last year to integrated project driven Qa\Qc processes into the existing WISKI time series structure. The intention of the project was to allow further data processing based on the standard WDTF data delivered from AWRIS to WISKI. In this context the requirements were as follows:

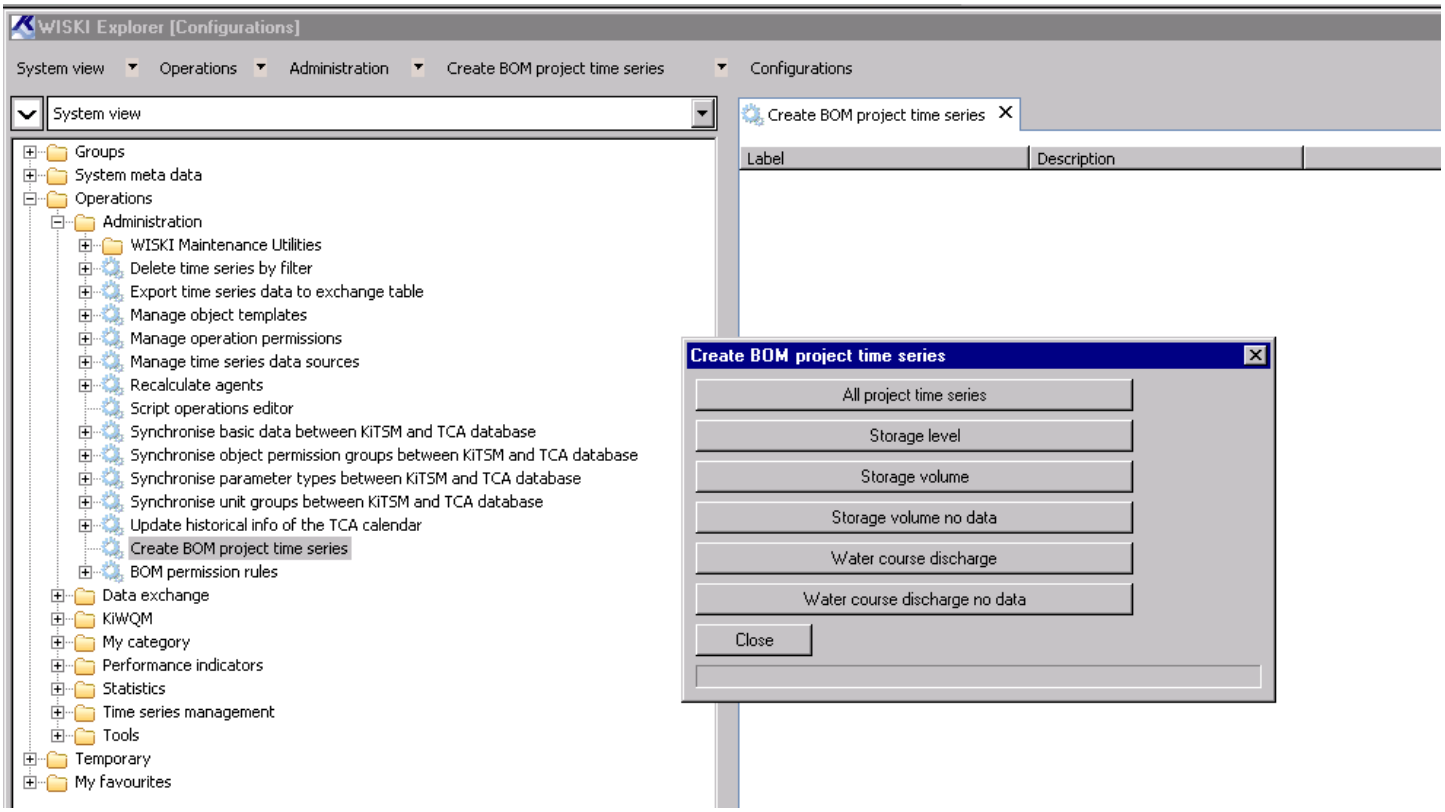
- The creation of new time series have to be based on rules.
- The source of the new time series are the standard time series delivered by the data providers.
- The new time series should be grouped in templates and stored in the data base.

The requirements could be covered by creating a new operation which creates based on specific rules certain project time series and uses the functionality of the operation framework. The framework provides a user interface for server-side services that have a dialog based GUI and are available on other client applications. It consists of functionality that can be dynamically registered inside the WISKI server. Once registered it provides dialogs and (context) menu items to configure the functionality on the WISKI client and execute it on the server.

The tool to design such an operation is the script editor. It opens a dialog as shown below were the XML script can be imported and tested. The script contains the content to configure WISKI and the GUI within the system (see example of the script editor functions and how it is called in the operations menu under ‘Administration’ below).

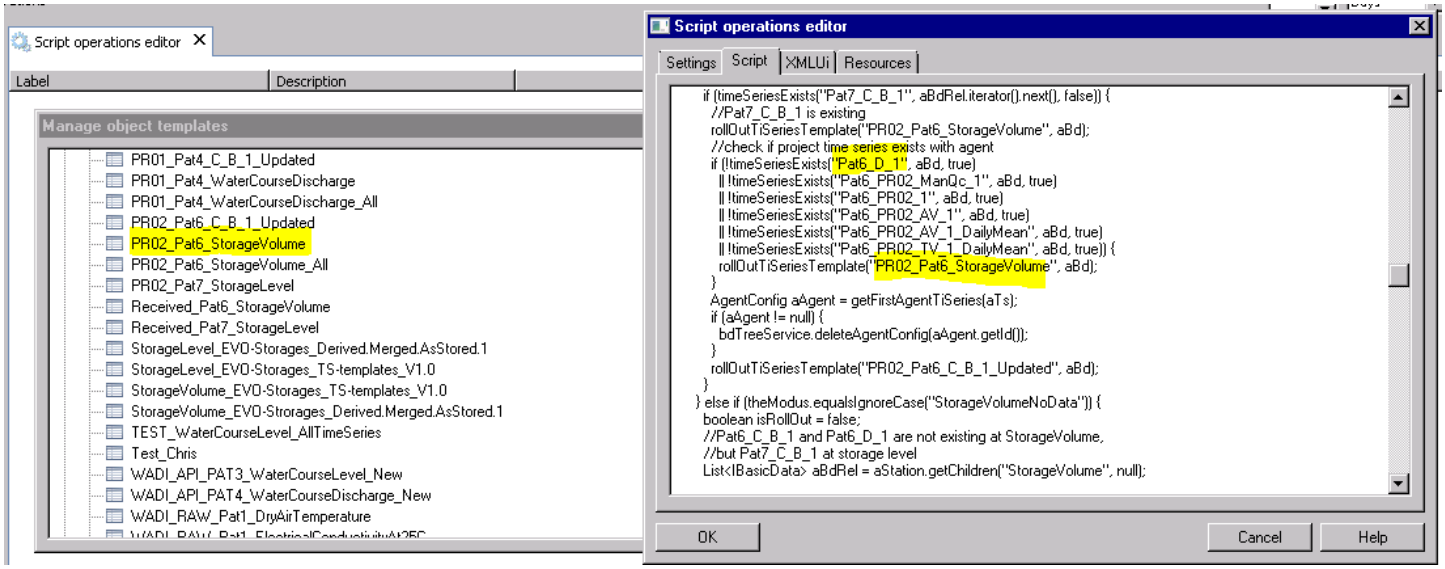


Once the script is imported the operation is available in the operations menu and can be executed. The execution can also be scheduled using the operation ID (see screen shot above) as a KiDSM task. The development for the BOM included five rule based tasks to roll-out certain time series templates. As shown below these were templates for the parameters storage level and storage volume and water course discharge.

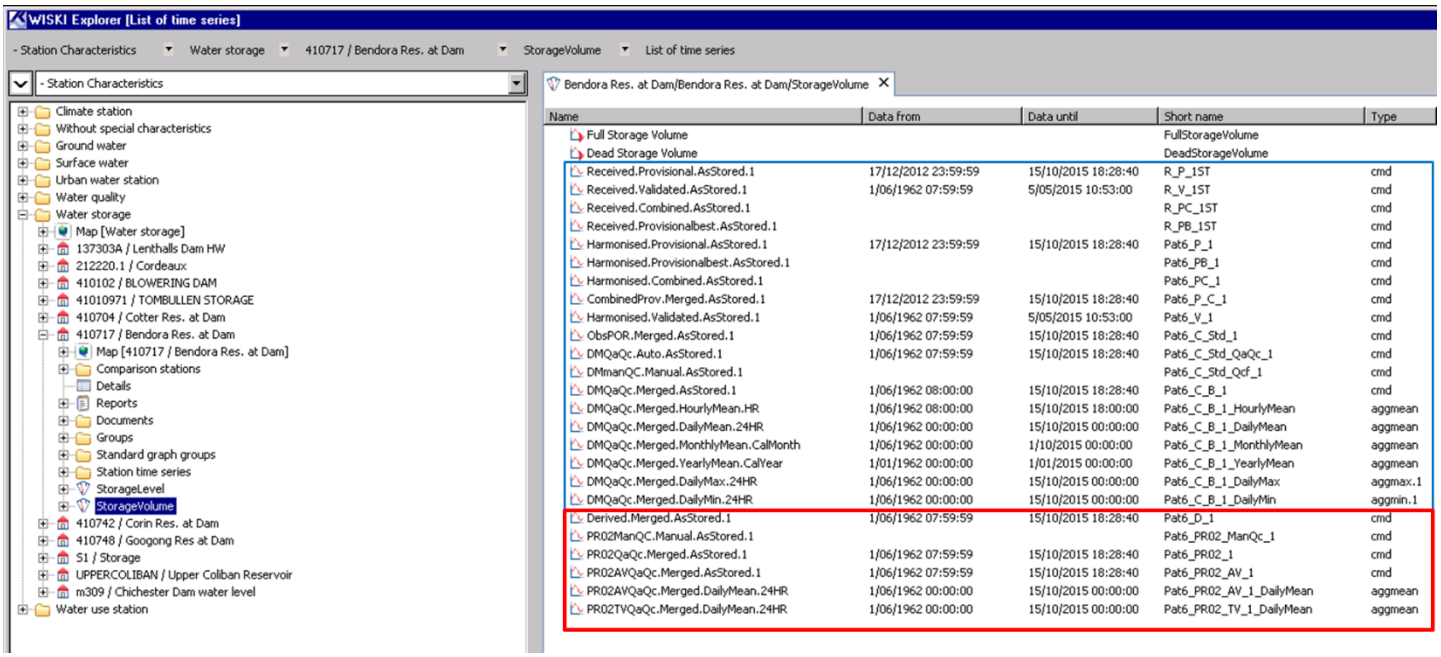


The templates were designed based on user needs to enhance the storage calculation as realised in AWRIS1 and to allow further data editing and validation for flood forecasting applications. The designed templates are stored in the

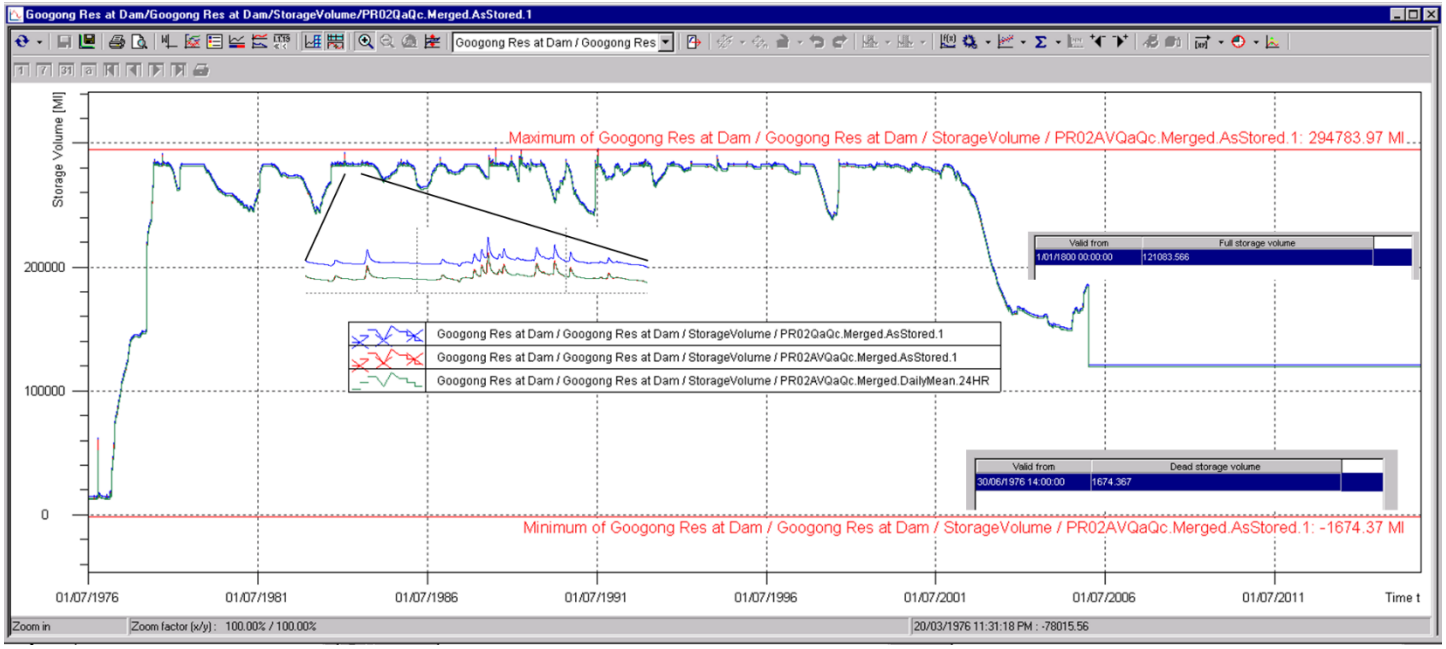
WISKI data base (see right window below) and are managed by the ‘Manage object template operation’. The BOM operation ‘Create BOM project time series’ will analyse the rules (as shown in the left window below) and roll-out the template if the conditions are met.



An example result for the storage volume parameter is shown below. The time series in the blue box are the time series created for the standard storage volume parameter. The time series in the red box are created by the operation and are rule based. They are created if storage level data is existing and will use a capacity table to calculate storage volume. Then the data is merged based on specific rules with the provider data. Further automated data validation looking at rate of change, quality thresholds and dead storage capacity are applied. The result is the daily available storage capacity.



The result above will feed the storage data mart in the future and will offer the WISKI time series editing and validation capacities to prepare the data. Below a WISKI standard graph is shown which displays the minimum and maximum values of the merged time series and subsubtract the dead storage capacity which is a station meta data attribute in the system.

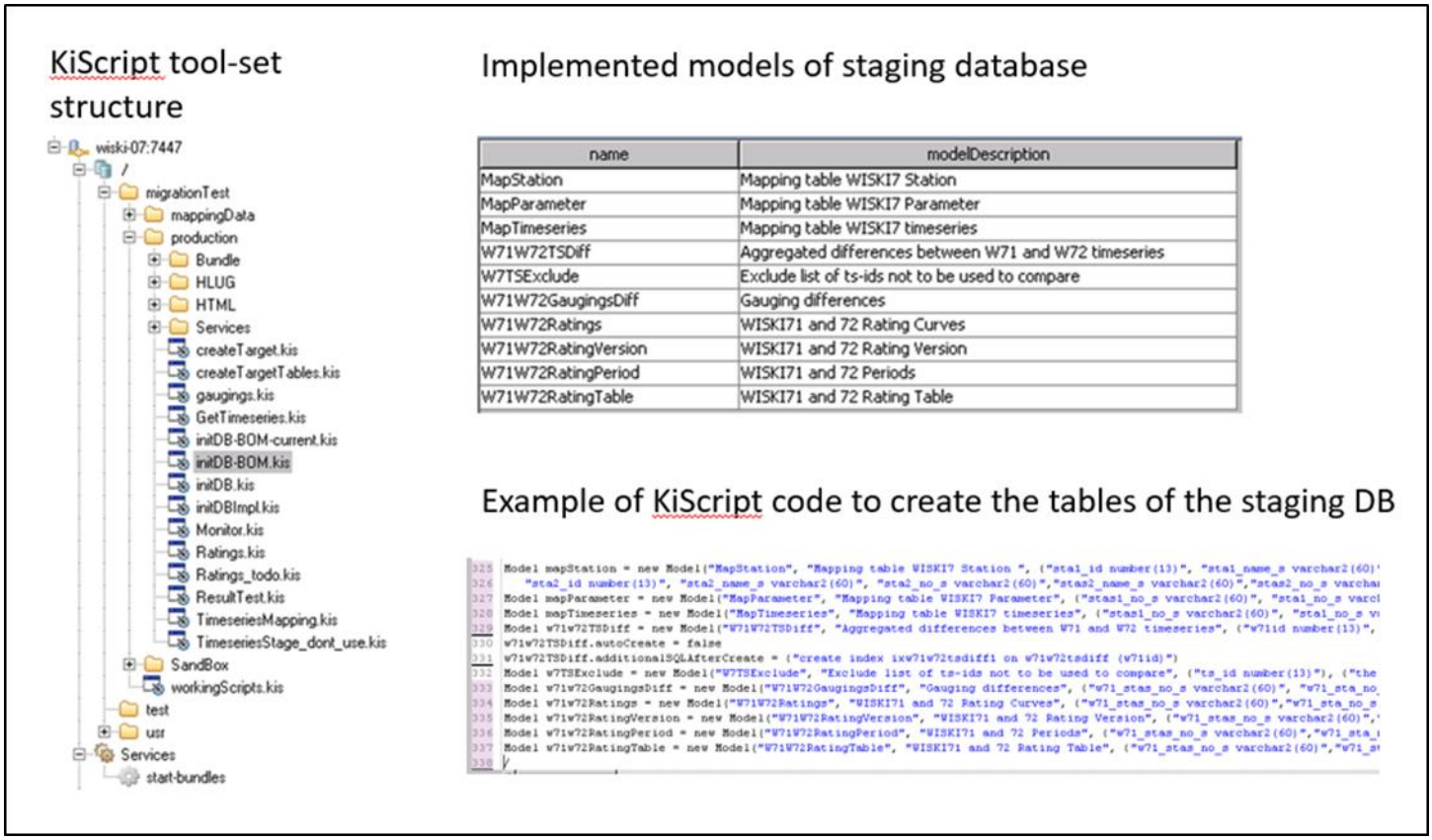


The example shows the powerful possibilities of the server-based XML scripting options to automate processes in the WISKI environment.

Project news: KiScript data comparison tool-set

KISTERS developed for the AWRIS2 data feed into WISKI a procedure to compare data in the existing WISKI database (data ingest from AWRIS1) with AWRIS2 data in WISKI. The challenge of the project was to compare billions of data points of time series, gaugings and ratings concerning their correct time stamps, values, quality codes and interpolation types. KISTERS used the KiScript platform in the project to integrate data from both WISKI systems into one staging database. The staging database was created and populated with KiScript models creating the result tables and populating them with the comparison data. To reach an optimised performance a cluster of three script servers was used where a central script server was creating and feeding the staging data base and two script servers which are part of the WISKI server systems were applying the models and extracting the data from the systems.

The approach was selected as KISTERS was recently using a similar approach to compare meta data, time series data, ratings and gaugings in the migration project of the Environmental Agency in England. The structure of the KiScript programs in the KiScript IDE, the created models and an example of the code to create the models are shown below.



Some key outcomes of the projects are as follows:

- The mapping models of stations, parameters and time series gave a quick overview of elements which are existing in one and not the other database. See the red marked missing time series in one database in the example below. The core elements to compare the meta data were the wcode plus station number, the parameter number and the time series shortname which are unique in the systems.

stas1_no_s	sta1_no_s	par1_no_s	ts1_id	ts1_shortname_s	stas2_no_s	sta2_no_s	par2_no_s	ts2_id	ts2_shortname_s
w00002-410704	410704	Rainfall	5189042	Pat2_V_1	w00002-410704	410704	Rainfall	1194010	Pat2_V_1
w00002-410704	410704	Rainfall	5185042	R_PB_1ST	w00002-410704	410704	Rainfall	1189010	R_PB_1ST
w00002-410704	410704	Rainfall	5183042	R_PC_1ST	w00002-410704	410704	Rainfall	1190010	R_PC_1ST
w00002-410704	410704	Rainfall	5182042	R_P_1ST	w00002-410704	410704	Rainfall	1187010	R_P_1ST
w00002-410704	410704	Rainfall	5184042	R_V_1ST	w00002-410704	410704	Rainfall	1188010	R_V_1ST
w00002-410704	410704	RelativeHumidity	5211042	Pat1_C_B_1	w00002-410704	410704	RelativeHumidity	1216010	Pat1_C_B_1
					w00002-410704	410704	RelativeHumidity	1220010	Pat1_C_B_1_DailyMax
w00002-410704	410704	RelativeHumidity	5212042	Pat1_C_B_1_DailyMean	w00002-410704	410704	RelativeHumidity	1217010	Pat1_C_B_1_DailyMean
					w00002-410704	410704	RelativeHumidity	1221010	Pat1_C_B_1_DailyMin
					w00002-410704	410704	RelativeHumidity	1218010	Pat1_C_B_1_MonthlyMean
					w00002-410704	410704	RelativeHumidity	1219010	Pat1_C_B_1_YearlyMean
w00002-410704	410704	RelativeHumidity	5208042	Pat1_C_Std_1	w00002-410704	410704	RelativeHumidity	1213010	Pat1_C_Std_1
w00002-410704	410704	RelativeHumidity	5209042	Pat1_C_Std_QaQc_1	w00002-410704	410704	RelativeHumidity	1214010	Pat1_C_Std_QaQc_1

- The calculation of time series intervals which are different allowed a very quick and systematic analysis of differences based on values, missing values, quality codes and interpolation types. A sample result is shown below. The red marked intervals are classified as different (=1) and show examples of difference in value (maxdiff and maxreldiff), difference in quality code (status) and missing data in one WISKI system (like missingw71). The example of the blue marked intervals are identical. However it was also analysed if one database had a missing value where the other data base had no value at all. This condition was not considered as a difference.

w71id	w72id	different	count	w71min	w71max	w72min	w72max	maxdiff	maxreldiff	missingconflict	missinginw71	missinginw72	status	interpolation
6715042	2414010	1	1022	1999-07-07 19:00:00.0	1999-07-28 09:50:00.0	1999-07-07 19:00:00.0	1999-07-28 09:50:00.0	0.0	0.0	0	0	0	1022	0
6715042	2414010	1	929	1998-06-24 16:51:20.0	1998-08-10 11:29:20.0	1998-06-24 16:51:20.0	1998-08-10 11:29:20.0	0.0	0.0	0	0	0	929	0
6715042	2414010	1	626	1998-08-10 11:59:10.0	1998-08-22 02:39:50.0	1998-08-10 11:59:10.0	1998-08-22 02:39:50.0	0.0	0.0	0	0	0	626	0
6715042	2414010	1	454	1998-08-22 03:00:50.0	1998-09-09 09:55:00.0	1998-08-22 03:00:50.0	1998-09-09 09:55:00.0	0.0	0.0	0	0	0	454	0
6715042	2414010	1	336	1997-09-08 12:00:00.0	1997-11-05 11:55:20.0	1997-09-08 12:00:00.0	1997-11-05 11:55:20.0	0.0	0.0	0	0	0	336	0
6715042	2414010	1	3	1996-06-11 12:20:00.0	1996-06-11 12:52:20.0	1996-06-11 12:20:00.0	1996-06-11 12:52:20.0	0.0	0.0	0	0	0	3	0
6715042	2414010	1	3	2015-08-18 13:44:50.0	2015-08-18 13:45:00.0	2015-08-18 13:44:50.0	2015-08-18 13:45:09.0	0.09699999999999998	0.05836341756...	0	1	0	2	0
6715042	2414010	1	2	1996-06-11 12:57:40.0	1996-06-11 12:59:40.0	1996-06-11 12:57:40.0	1996-06-11 12:59:40.0	0.0	0.0	0	0	0	2	0
6715042	2414010	1	2716	2013-08-13 09:45:00.0	2013-08-13 09:45:00.0	2013-07-03 11:45:00.0	2013-08-13 09:45:00.0			0	2716	0	1	1
6715042	2414010	1	1	1997-11-26 09:06:20.0	1997-11-26 09:06:20.0	1997-11-26 09:06:20.0	1997-11-26 09:06:20.0	1.26	1.26	0	0	0	1	0
6715042	2414010	1	1	1998-06-24 16:09:20.0	1998-06-24 16:09:20.0	1998-06-24 16:09:20.0	1998-06-24 16:09:20.0	0.0	0.0	0	0	0	1	0
6715042	2414010	1	1	1997-09-08 11:42:20.0	1997-09-08 11:42:20.0	1997-09-08 11:42:20.0	1997-09-08 11:42:20.0	0.0	0.0	0	0	0	1	0

w71id	w72id	different	count	w71min	w71max	w72min	w72max	maxdiff	maxreldiff	missingconflict	missinginw71	missinginw72	status	interpolation
6715042	2414010	0	92628	1999-07-28 10:00:00.0	2011-12-18 01:30:00.0	1999-07-28 09:59:59.0	2011-12-18 01:30:00.0	0.0	0.0	87	0	0	0	0
6715042	2414010	0	9195	1993-10-18 13:56:21.0	1996-04-10 09:55:20.0	1993-10-18 16:37:00.0	1996-04-10 09:55:20.0	0.0	0.0	22	0	0	0	0
6715042	2414010	0	9092	1990-03-23 13:03:00.0	1991-07-13 11:20:30.0	1990-03-23 13:02:59.0	1991-07-13 11:20:30.0	0.0	0.0	37	0	0	0	0
6715042	2414010	0	8783	2015-08-18 13:45:10.0	2015-12-22 09:45:00.0	2015-08-18 13:45:10.0	2015-12-22 09:45:00.0	0.0	0.0	0	0	0	0	0
6715042	2414010	0	8490	2015-02-01 10:00:00.0	2015-06-04 18:15:00.0	2015-02-01 10:00:00.0	2015-06-04 18:15:00.0	0.0	0.0	1	0	0	0	0
6715042	2414010	0	7875	1991-07-13 11:21:01.0	1992-11-30 13:33:00.0	1991-07-13 11:21:30.0	1992-11-30 13:33:00.0	0.0	0.0	25	0	0	0	0
6715042	2414010	0	7405	1992-11-30 13:36:21.0	1993-10-18 13:54:00.0	1992-11-30 19:36:20.0	1993-10-18 13:54:00.0	0.0	0.0	10	0	0	0	0
6715042	2414010	0	6449	2015-12-22 10:00:00.0	2016-04-03 06:30:00.0	2015-12-22 10:00:00.0	2016-04-03 06:30:00.0	0.0	0.0	2	0	0	0	0

- For gaugings and ratings difference tables were calculated which allow the comparisons on value and quality code and additionally on version number and validity for ratings.

The staging database now builds the repository for any data comparison tasks for the BOM which is extensible and can be updated whenever required by rerunning selected tasks to update the difference models. The example demonstrated the capability of KiScript as data integration tool in a very efficient and timely manner. The result was achieved by only a few turn-overs between BOM staff and KISTERS staff and help to identify the differences very quickly.

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. 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
Basic WISKI
Advanced Hydstra
Advanced WISKI
Hydstra Administration
WISKI 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
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. The following courses are scheduled so far:

Advanced Hydstra	28-29 June in Canberra
Basic Hydstra	12-13 July in Canberra
Administering Hydstra	2-3 August in Canberra

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.

KISTERS Canberra Phone Numbers

We have been using a VOIP-based phone system based on open source Asterisk software in Canberra for some years now, and we recently cancelled most of our analogue phone lines. The following numbers have been terminated: 02 62882288, 02 62882356, 02 62882756, 02 62882024. Please update your internal phone directories accordingly.

Please use the following phone numbers if you wish to contact someone in Canberra directly:

02 6154-5200	KISTERS Support
02 6154-5210	Bill Steen
02 6154-5211	Damian Skinner
02 6154-5212	Markus Bauerle
02 6154-5214	Rob Smith
02 6154-5215	Alain Remont
02 6154-5216	Chris Michl
02 6154-5217	Debbie Cockburn
02 6154-5218	Peter Heweston
02 6154-5219	Song Guo
02 8091-5212	Denby Angus

The VOIP system emails voice messages directly to the recipient if they are away from their desk.

The only analogue phone number that remains is the alternate support number 02 6288 2302. Our fax remains the same on 02 6288 9061.

Staff News

New Staff Member Song Guo

We are pleased to welcome a new colleague, Song Guo, who recently joined KISTERS Pty Ltd in the Canberra office.

Email: song.guo@kisters.com.au
Phone: +61 2 6154 5219
Mobile phone: +61 427 112 408

Song has an strong background and working experience in the energy industry. Before joining KISTERS he was a senior power system engineer working for the British Electricity Transmission System Operator, National Grid in Warwick (UK). He also has work experience in energy consulting for Alstom and Edif in Europe. He has a PhD in power system and control engineering from Durham University (UK) and his specialties include power system analysis, statistical analysis, project management and business development.

Song has recently moved to Canberra and will be developing our energy business in the Australia and Asia Pacific region.

We welcome Song and wish him all the best in his new job.

New Staff Member Markus Bauerle

We are pleased to welcome a new colleague, Markus Bauerle, who recently joined KISTERS Pty Ltd in the Canberra office. Markus joined the KISTERS team starting on the 29th of February and primary role is to provide support and consulting services for WISKI users in the Australia Pacific region, as well as gaining expertise with the use of KiScript. So far he has been assisting primarily with handling the support load for WISKI.

Originally a German native, Markus has been living in Australia since 2009. He is a recent graduate with a background in Environmental Science and Hydrological Modelling. He holds a Master's Degree from the Queensland University of Technology and has recently relocated to Canberra. He is a native German speaker – handy for dealing with Aachen!

Markus Bauerle
Email: markus.bauerle@kisters.com.au
Phone: 6154 5212
Mobile phone: +61 4 5157 3829

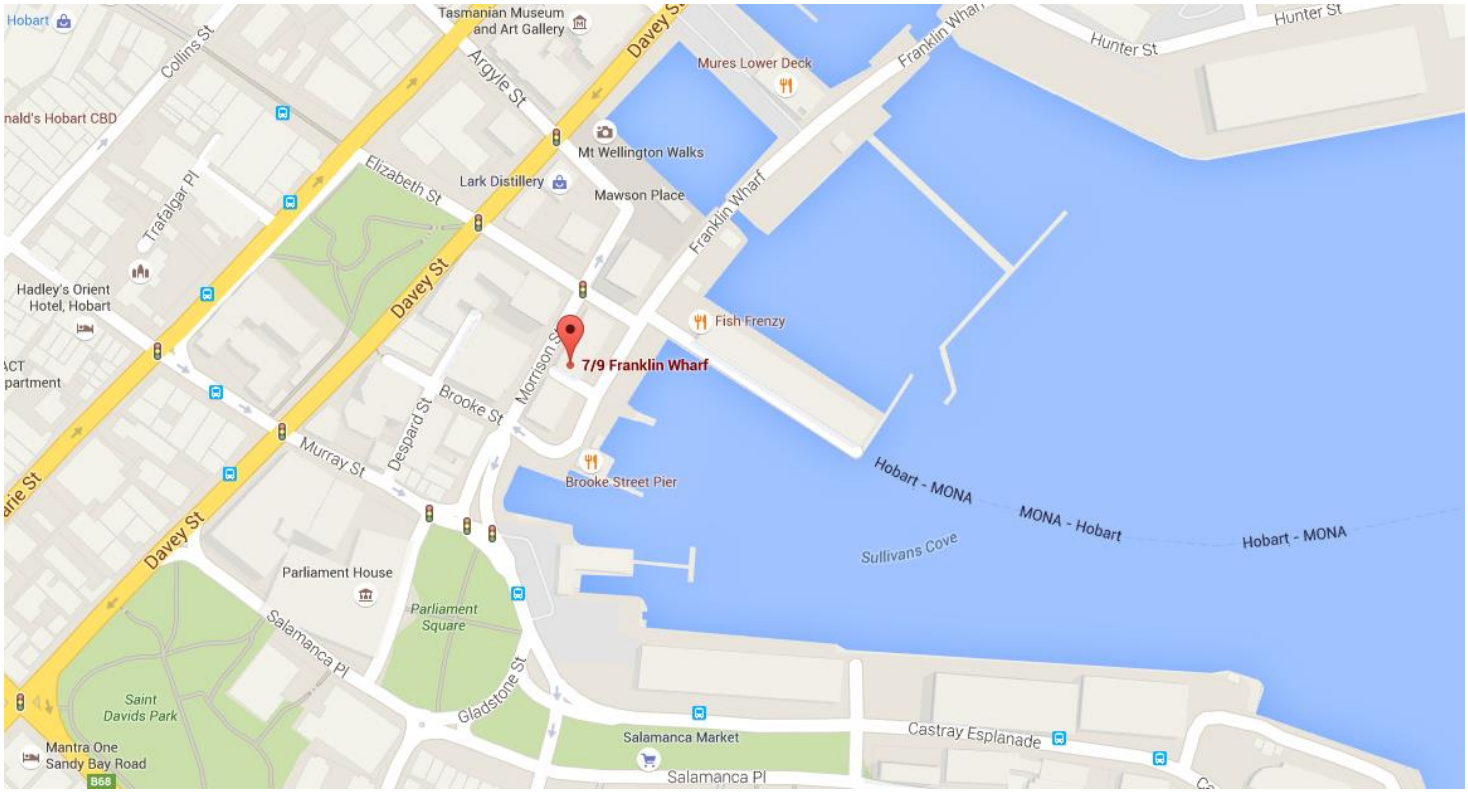
KISTERS Hobart Office Relocation

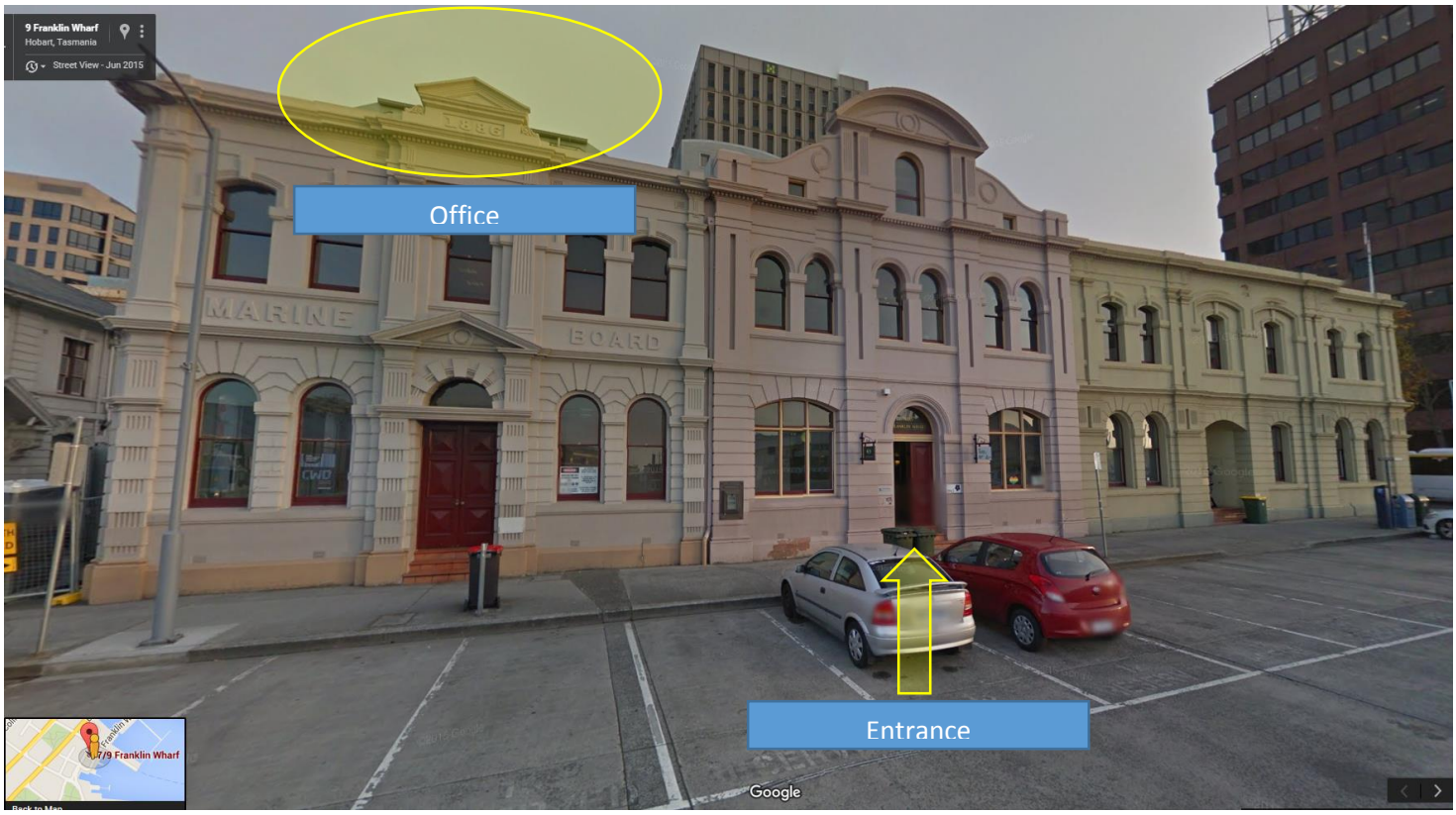
The Hobart office has relocated to a new address in downtown Hobart. The address is:

Unit 6, 7-9 Franklin Wharf
Hobart TAS 7000

Postal and email details remain as before. The new office is on the National Broadband Network (NBN) and we are seeing much significantly improved internet bandwidth to Canberra and other locations.

Presently there is no direct phone or fax line into to the office – the NBN hasn't all been a bundle of joy! Please use Skype or personal mobile phone numbers if you need to speak directly to Hobart staff.


Hobart
Collins St
Tasmanian Museum and Art Gallery
Davey St
Argyle St
Mures Lower Deck
Franklin Wharf
Hunter St
Mt Wellington Walks
Lark Distillery
Mawson Place
Elizabeth St
Trafalgar Pl
Hadley's Orient Hotel, Hobart
Davey St
Fish Frenzy
7/9 Franklin Wharf
Morrison St
Brooke St
Despaird St
Murray St
Brooke Street Pier
Hobart - MONA
MONA - Hobart
Hobart - MONA
Sullivans Cove
Parliament House
Parliament Square
Salamanca Pl
Gladstone St
Saint Davids Park
Salamanca Market
Castray Esplanade
Mantra One Sandy Bay Road
B68


9 Franklin Wharf
Hobart, Tasmania
Street View - Jun 2015
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Information

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All personal KISTERS Pty Ltd email addresses in Australia are of the form *firstname.lastname@kisters.com.au*, but all general support and accounting emails should be addressed to support@kisters.com.au .

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