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ThamesRiver
CLEAR WATER REVIVAL



Committed to a Healthy and Vital Thames River

Water Quantity Data Management in the Upper Thames River Conservation Authority

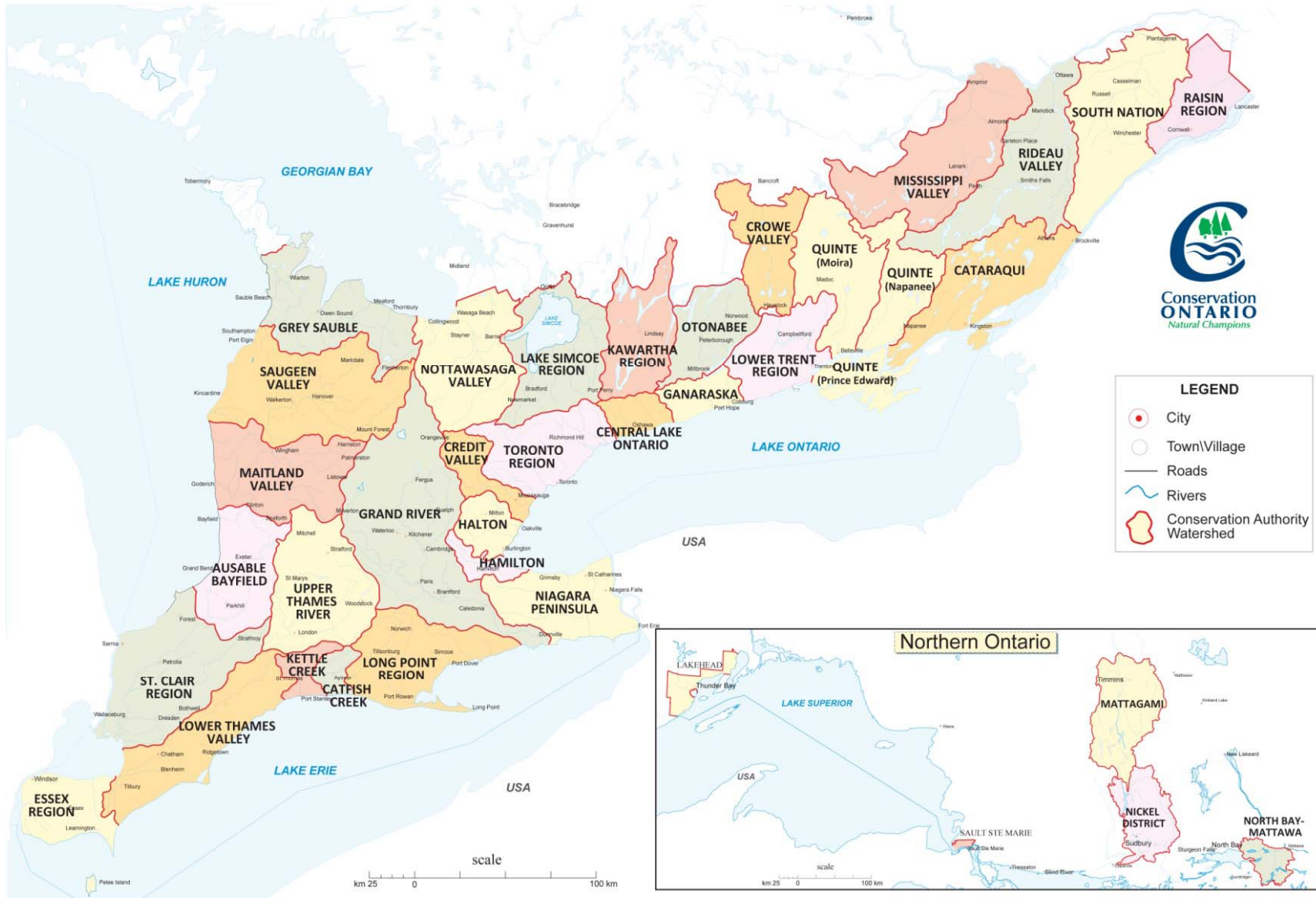
Mark Helsten. P.Eng. M.E.Sc.
Senior Water Resources Engineer
03 December 2014

Outline

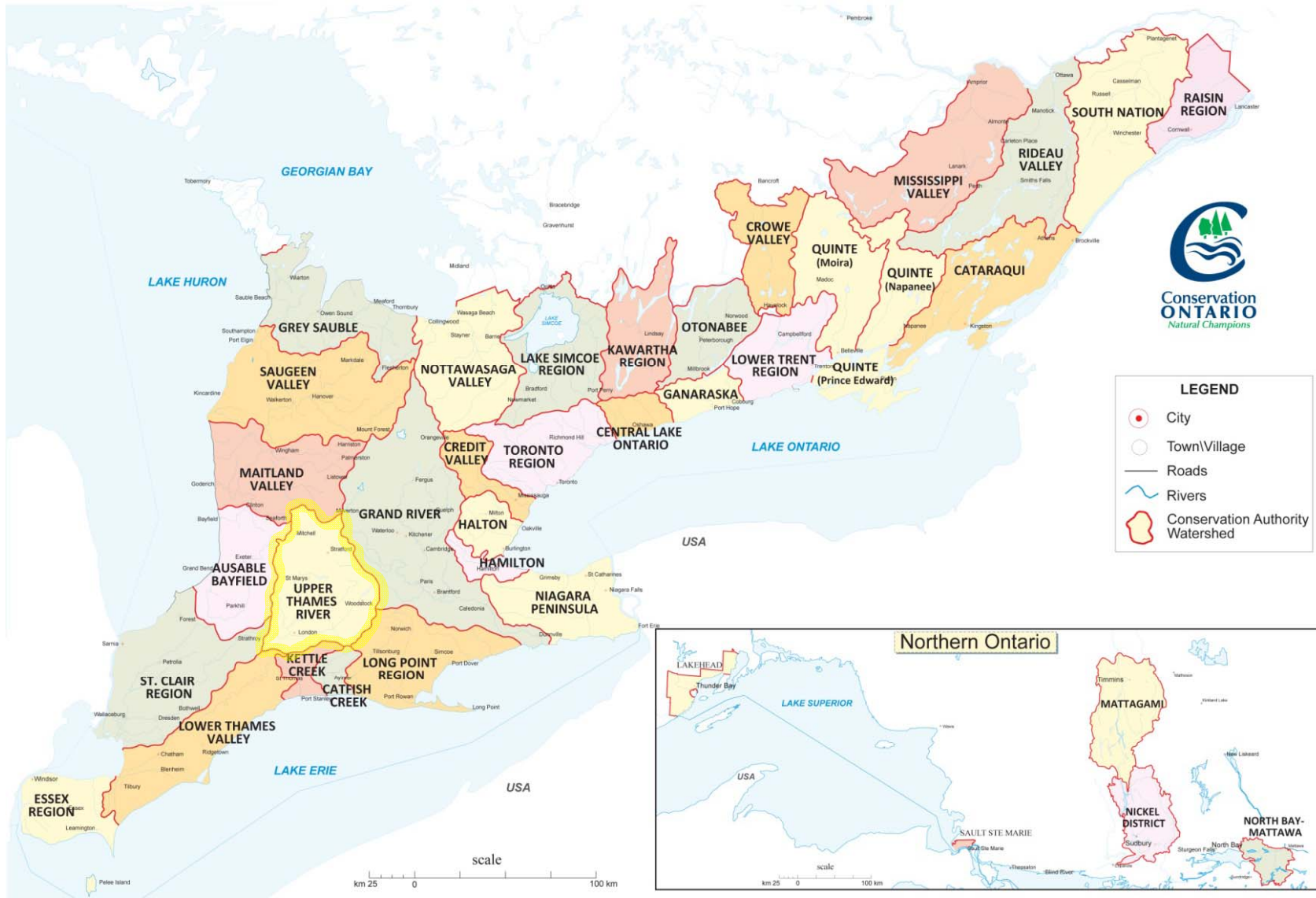
- Background
- History
- WISKI
- SODA
- Future Directions



Conservation Authorities of Ontario

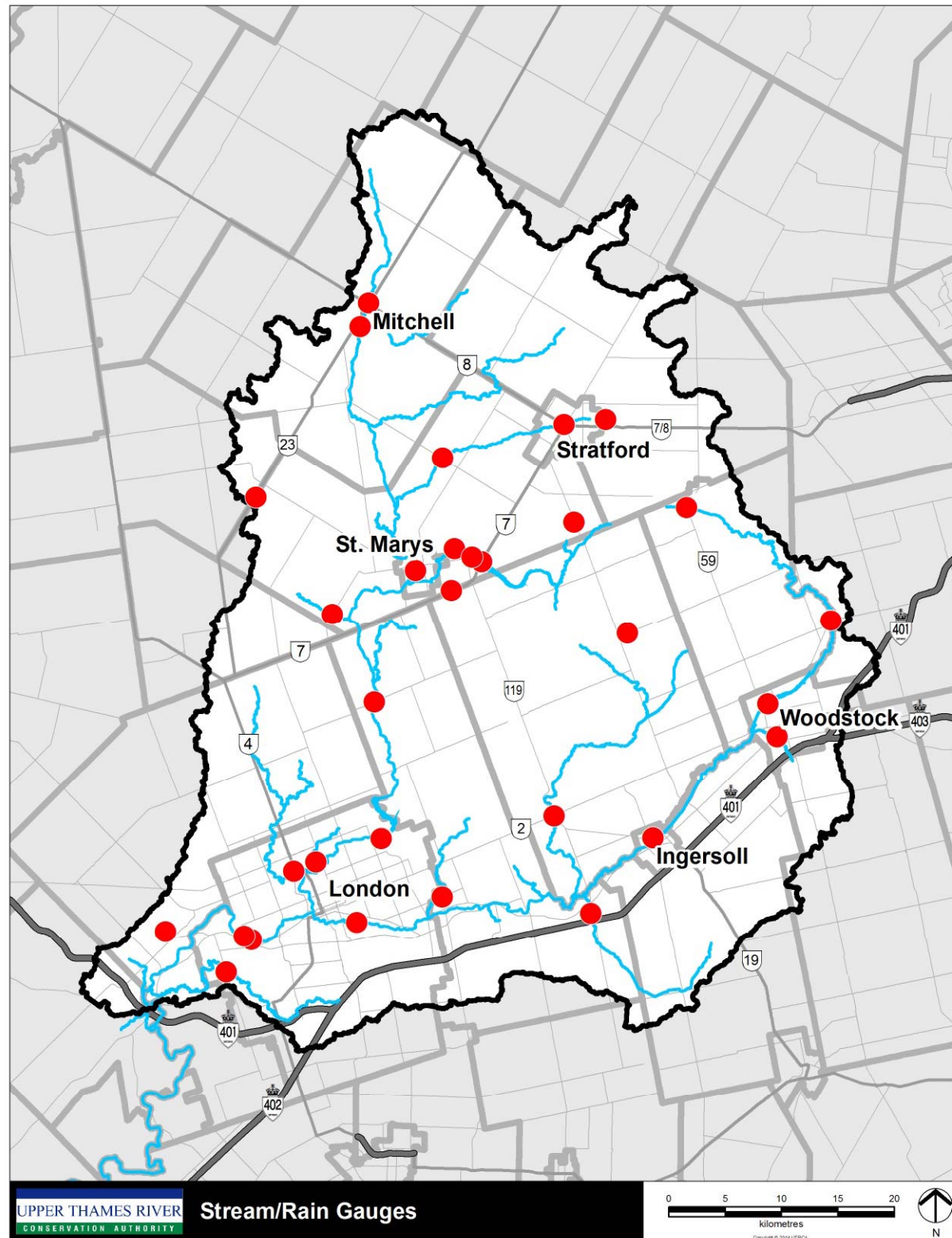


Conservation Authorities of Ontario



UTRCA Stream/ Climate Gauge Network

- 24 river level stations
- 6 reservoir level stations
- 20 rain gauges
- Also measure air temperature, solar radiation, wind speed/ direction, water temperature
- 5 LTVCA river level stations



History

- UTRCA DATS software – 1984 – 1997
- Commercial BRFU software – 1997 - ~2004
- UTRCA DMS software – 2003- 2011
- WISKI 7 - 2010 - present



WISKI 7.4 Advantages

- Widespread international use
- Excellent customer support
- Highly customizable/configurable
- Many additional modules available
 - REST-API
 - Water Quality
 - Benthic
 - GIS
 - Alarm management
 - Data acquisition management



WISKI 7.4

WISKI Explorer [Stations of site]

Site By Number 0 / --- Stations of site

Site By Number

- 0 / ---
- 1 / Groundwater
- 2 / Snowcourse
- 3 / EC_Climate
- 4 / Large Subwatersheds
- 5 / LondonRain
- 6 / Water Quality
- 7 / Conservation Services
- 999 / Test Site

Label	Name	Number
00 / Index Station	Index Station	00
01 / Mitchell	Mitchell	01
02 / Avon	Avon	02
03 / Wildwood Dam	Wildwood Dam	03
04 / St. Marys	St. Marys	04
05 / Plover Mills	Plover Mills	05
05b / Fanshawe Inflow Esti...	Fanshawe Inflow Estimate	05b
06 / Fanshawe Dam	Fanshawe Dam	06
07 / Medway	Medway	07
08 / Innerkip	Innerkip	08
08b / Pitttock Inflow estimate	Pitttock Inflow estimate	08b
09 / Pitttock Dam	Pitttock Dam	09
09b / Cedar Thames Confl	Cedar Thames Confl	09b
10 / Cedar Cr.	Cedar Cr.	10
100 / 100	100	100
11 / Ingersoll	Ingersoll	11
12 / Thamesford	Thamesford	12
13 / Waubuno Cr.	Waubuno Cr.	13
14 / Ealing	Ealing	14
14b / Ealing Surrogate	Ealing Surrogate	14b
15 / Byron	Byron	15
15b / Byron Surrogate	Byron Surrogate	15b
16 / Dutton	Dutton	16

Log X

Show errors Show all

Time stamp Message

wiski on wiski2@fwsq\sql2012 (MsSql) - User: helsterm | KiTSM: WISKI / 10.1.1.41 / 7430

Ready



WISKI 7.4

The screenshot displays the WISKI 7.4 software interface. The window title is "WISKI". The menu bar includes "File", "Edit", "View", "Tools", "Windows", and "Help". The toolbar contains various icons for file operations and data management. The main window is divided into two panes. The left pane, titled "Site By Number", shows a tree view of monitoring stations, with "0 / ---" selected. The right pane, titled "---/Mitchell X", displays a table of parameters for the selected station.

Name	Unit	Kind	Parameter type	Station characteristic
HG	meter (m)	Measured	HG / River Stage	Surface water
PP	millimeter (mm)	Measured	PP / Precipitation (incremental)	Surface water
PP_30D	millimeter (mm)	Calculated	PP / Precipitation (incremental)	Surface water
PP_90D	millimeter (mm)	Measured	PP / Precipitation (incremental)	Surface water
QB	millimeter (mm)	Calculated	QB / Runoff Depth	Surface water
QR	cubic meter ...	Measured	QR / River Discharge	Surface water
QR_30D	cubic meter ...	Measured	QR / River Discharge	Surface water
QR_7D	cubic meter ...	Measured	QR / River Discharge	Surface water
SM	millimeter (mm)	Calculated	SM / Potential Snow Melt	Surface water
SP	millimeter (mm)	Calculated	SP / Potential Snowmelt Plus rain	Surface water
TA	degree Celsi...	Measured	TA / Air Temperature	Surface water
VB	volt (V)	Measured	VB / Battery Voltage	Surface water



WISKI 7.4

WISKI

File Edit View Tools Windows Help

Site By Number 0 / --- 01 / Mitchell Parameter of station

Site By Number

Name	Unit	Kind	Parameter type	Station characteristic
HG	meter (m)	Measured	HG / River Stage	Surface water
PP	millimeter (mm)	Measured	PP / Precipitation (incremental)	Surface water
PP_30D	millimeter (mm)	Calculated	PP / Precipitation (incremental)	Surface water
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Ready



WISKI 7.4

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WISKI 7.4

The screenshot shows the WISKI 7.4 software interface. The left pane displays a tree view of sites, with '01 / Mitchell' selected. The right pane shows a table of parameters for the selected site. A yellow circle highlights the site list, and a yellow arrow points from it to the 'HG' parameter row in the table.

Name	Unit	Kind	Parameter type	Station characteristic
HG	meter (m)	Measured	HG / River Stage	Surface water
PP	millimeter (mm)	Measured	PP / Precipitation (incremental)	Surface water
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WISKI 7.4

The screenshot displays the WISKI 7.4 software interface. The window title is "WISKI". The menu bar includes "File", "Edit", "View", "Tools", "Windows", and "Help". The toolbar contains various icons for file operations and data management. The main window is titled "List of time series" and shows a tree view on the left and a data table on the right.

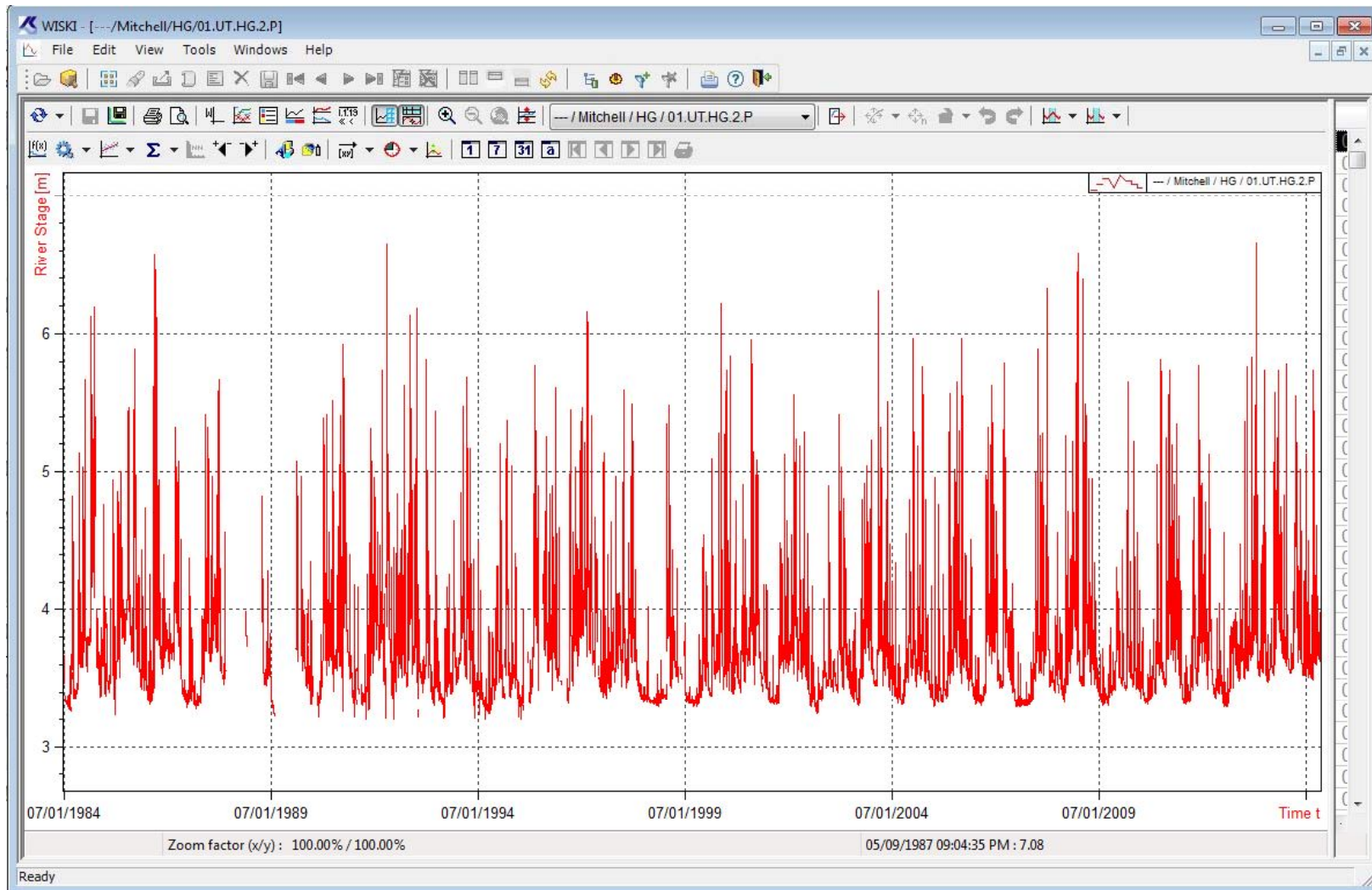
The tree view on the left shows a hierarchy of sites. The selected site is "01 / Mitchell", which is expanded to show various data series. The "HG" series is highlighted in blue.

The data table on the right shows the following information:

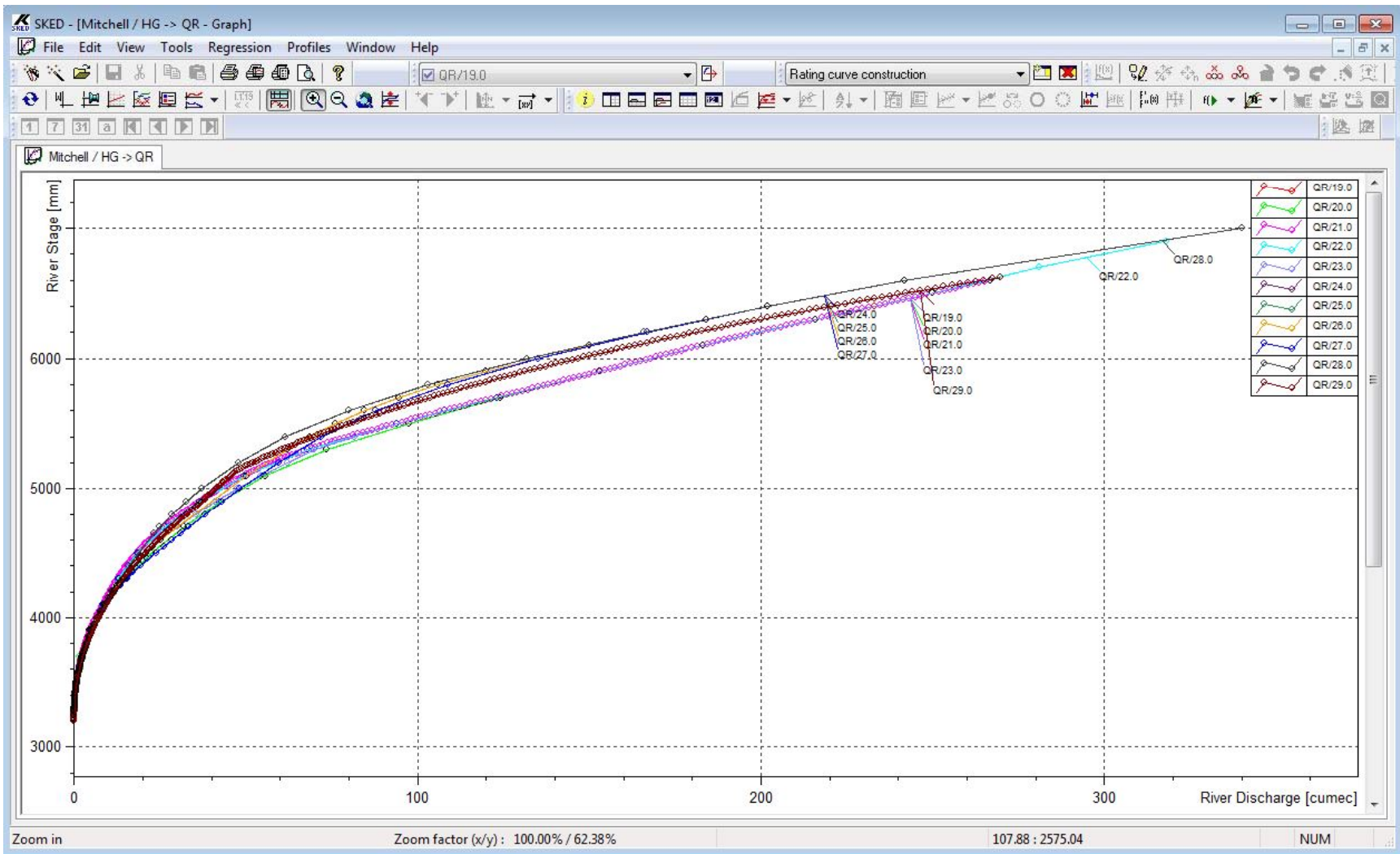
Name	Data from	Data until	Short name	Type	Time zone	Comment
01.UT.HG.1.O	06/27/1984 01:00:00	11/18/2014 15:00:00	Cmd.O	cmd	US/Eastern	
01.UT.HG.2.P	06/27/1984 01:00:00	11/18/2014 15:00:00	Cmd.P	cmd	US/Eastern	
01.UT.HG.DSS.Export.3.P			h.Cmd.P	cmd	US/Eastern	
01.UT.HG.Daily.3.P	06/27/1984 00:00:00	11/18/2014 00:00:00	Day.Mean.P	aggmean	US/Eastern	
01.UT.HG.MASL.3.P			Cmd.P-2	cmd	US/Eastern	
02.EC.QR.15m.1.O			15m.Cmd.O	cmd	US/Eastern	



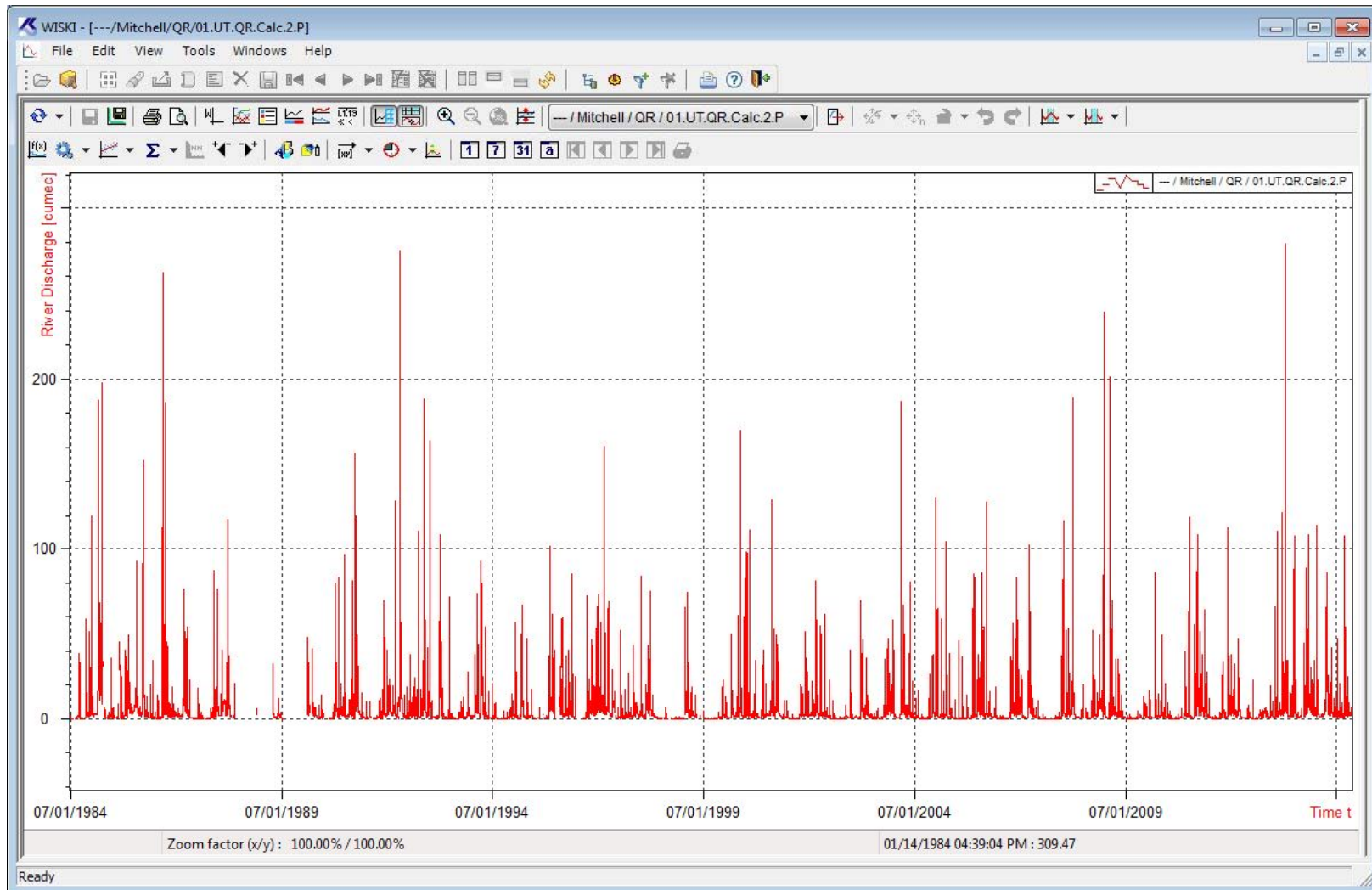
WISKI 7.4



SKED rating curve manager



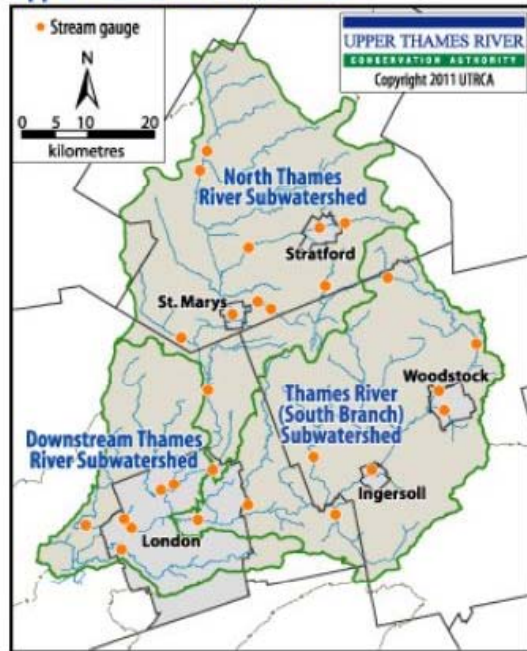
WISKI 7.4



Web Published Data

Thames River Flows & Other Information

Upper Thames River Watershed



The Upper Thames River Conservation Authority monitors several stream flow and meteorological stations throughout the watershed as part of its Flood Control Program. Links are also provided here to the LOWER THAMES VALLEY CONSERVATION AUTHORITY stream gauge network.

These stations measure parameters such as water level, rainfall and air temperature in real-time, recording values on at least an hourly basis. This information is collected from remote sites via telephone modem on a daily basis during low flow periods and more frequently during floods, and then stored.

Water levels are converted to flows, which are measured in cubic metres/second (CMS).

1 cubic metre (1,000 litres) = 2 bathtubs
100 cubic metres = an in-ground swimming pool

We measure stream flow at 23 locations, rainfall at 16 locations and reservoir levels at four locations. Other meteorological parameters, such as air temperature, wind speed and direction and solar radiation, are also measured at some locations. During the winter months, staff conduct manual [snow surveys](#) on a bi-weekly schedule to provide information on the state of the snow pack.

Thames River Stream Gauges

- > [North Thames River](#)
- > [South Thames River](#)
- > [Downstream Thames River](#)
- > [Lower Thames Valley Conservation Authority](#)

River Levels

- > [Thames River Flows & Other Information](#)
- > [Reservoir Levels](#)
- > [Meteorological Information](#)
- > [Summary Reports](#)
- > [Links](#)

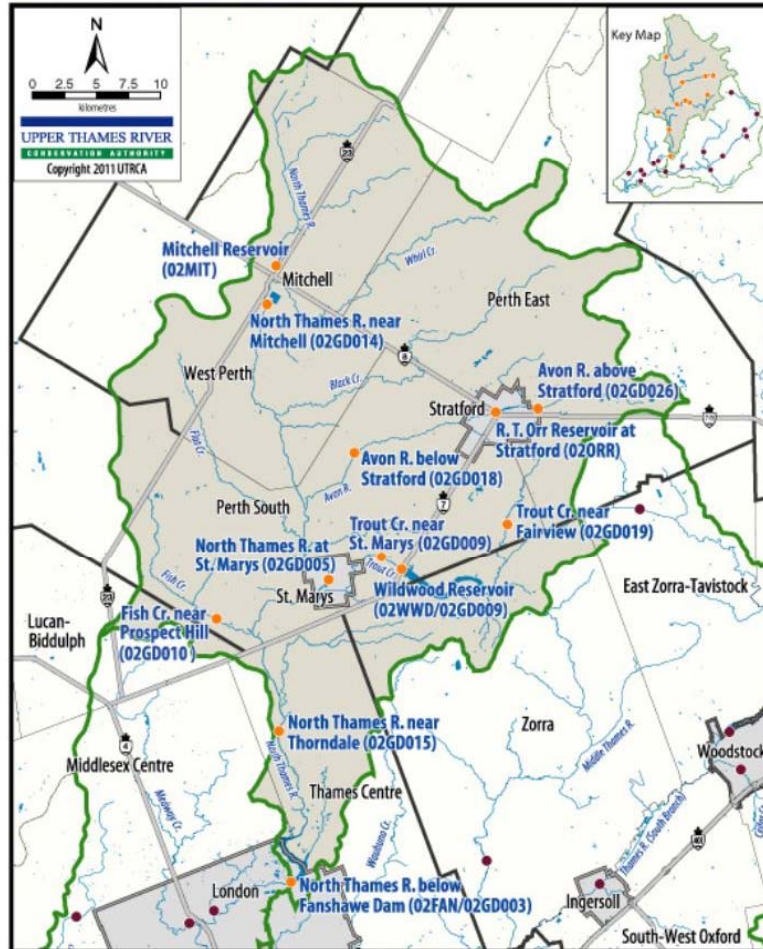
UTRCA Flood Bulletins

There are no current flood bulletins in the UTRCA watershed.



Web Published Data

North Thames River Subwatershed



North Thames River & Tributary flows

North Thames River Stream Gauges

- > Avon River above Stratford
- > Avon River below Stratford
- > Fish Creek near Prospect Hill
- > Mitchell Reservoir
- > North Thames River at St. Marys
- > North Thames River below Fanshawe Dam
- > North Thames River near Mitchell
- > North Thames River near Thorndale
- > RT Orr Reservoir at Stratford
- > Trout Creek near Fairview
- > Trout Creek near St. Marys
- > Wildwood Reservoir

South and Downstream Thames River Stream Gauges

- > South Thames River
- > Downstream Thames River
- > Lower Thames Valley CA Stream Gauges

River Levels

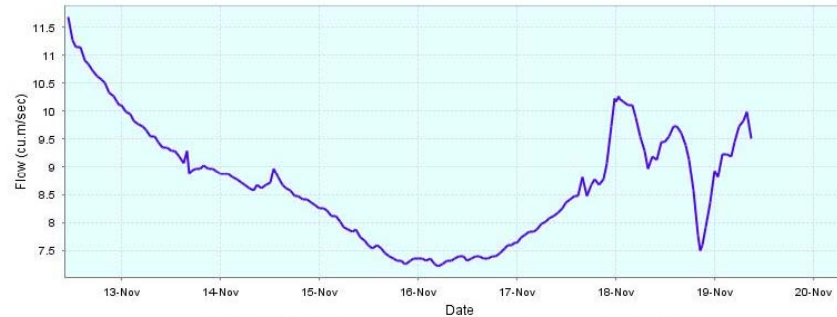
- > Thames River Flows & Other Information
- > Reservoir Levels
- > Meteorological Information
- > Summary Reports



Web Published Data

Upper Thames River Conservation Authority > Water Management > Thames River Levels > North Thames River Stream Gauges > North Thames River at St Marys

UTRCA Streamflow Monitoring System
North Thames River at St. Marys: Flow (cu.m/sec)
(Nov 12, 2014 - Nov 20, 2014)



Nov 19, 2014 10:06 EST. Average Flow = 8.7 cms *Caution: Provisional Data!****

UTRCA Streamflow Monitoring System
North Thames River at St. Marys: Water Level (m)
(Nov 12, 2014 - Nov 20, 2014)



Nov 19, 2014 10:06 EST. Average Level = 3.106 m *Caution: Provisional Data!****



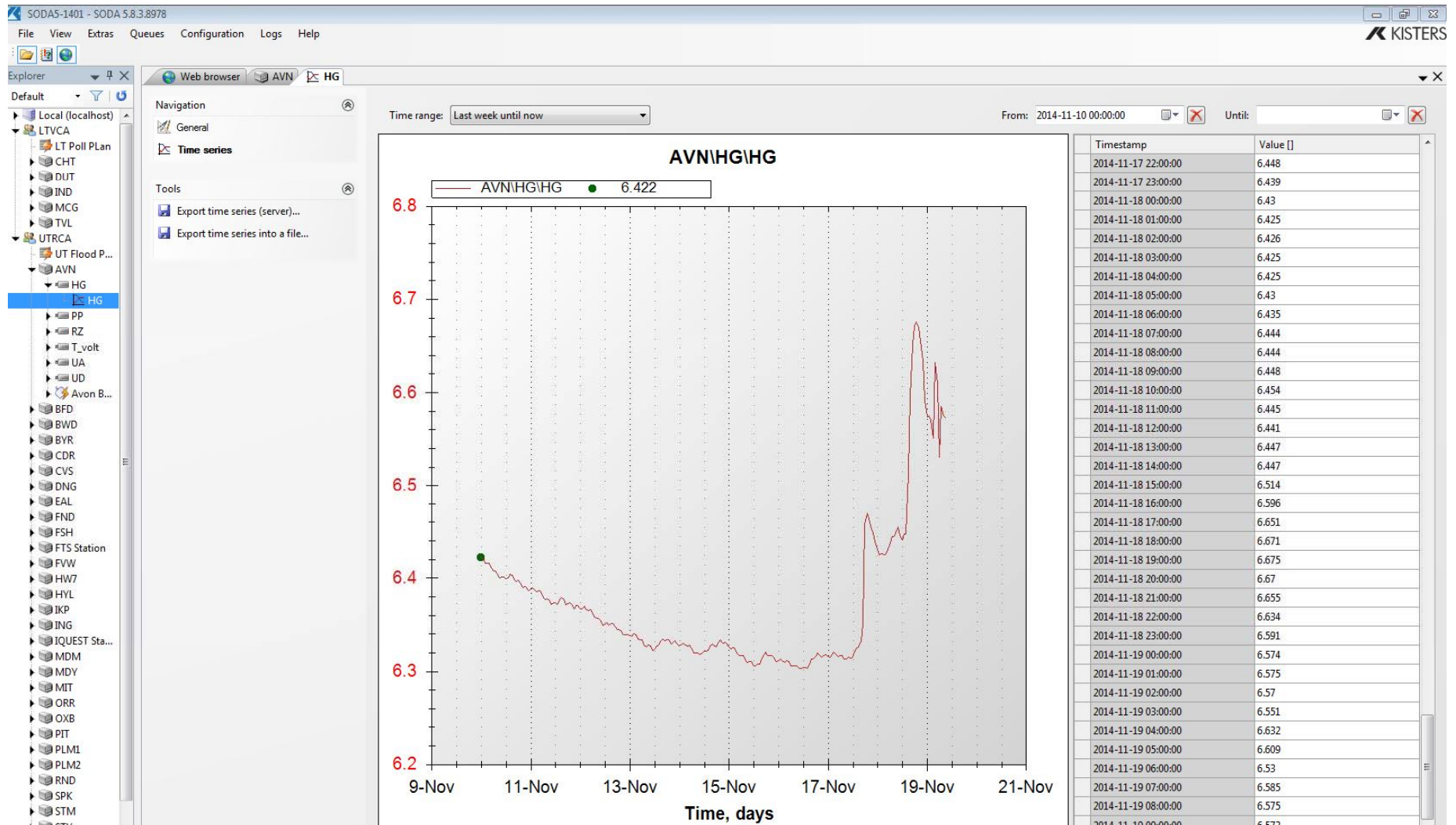
Web Published Data

UTRCA Data Summary 19-Nov-2014 10:07

Water Level Summaries													
Location	Time	Last hour	Last 2 hr	Last 3 hr	Today's Average	Today max	Today Min	2 Day Average	2d max	2D min	7 Day Average	7D max	7D min
	(EST)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
Mitchell	19-Nov-2014 09:00	3755	3752	3751	3760	3772	3751	3748	3825	3671	3708	3825	3667
Avon	19-Nov-2014 09:00	6573	6575	6585	6577	6632	6530	6529	6675	6425	6372	6675	6303
Wildwood Dam	19-Nov-2014 09:00	3946	3947	3949	3953	3961	3946	3975	4005	3946	4075	4200	3946
St. Marys	19-Nov-2014 09:00	3122	3131	3128	3120	3131	3109	3118	3136	3082	3102	3136	3076
Plover Mills	19-Nov-2014 09:00	1756	1762	1764	1763	1783	1751	1793	1830	1751	1772	1835	1731
Fanshawe Dam	19-Nov-2014 07:00	633	633	632	628	633	621	572	633	493	555	645	432
Medway	19-Nov-2014 09:00	3561	3560	3560	3554	3562	3549	3567	3588	3549	3578	3613	3549
Innerkip	19-Nov-2014 09:00	7424	7429	7428	7409	7429	7386	7383	7429	7329	7376	7429	7329
Pittock Dam	19-Nov-2014 09:00	1513	1515	1517	1523	1534	1513	1547	1594	1513	1725	1874	1513
Cedar Cr.	19-Nov-2014 09:00	3563	3563	3563	3560	3563	3554	3566	3582	3554	3572	3584	3554
Ingersoll	19-Nov-2014 09:00	1352	1347	1339	1349	1363	1336	1374	1411	1336	1368	1417	1306
Thamesford	19-Nov-2014 09:00	8850	8854	8857	8869	8897	8850	8895	8923	8850	8912	8938	8850
Ealing	19-Nov-2014 09:00	454	440	426	452	507	426	534	611	426	555	611	426
Byron	19-Nov-2014 09:00	1876	1876	1876	1912	1962	1876	1952	1987	1876	2020	2070	1876
Dutton	19-Nov-2014 09:00	3960	3969	3970	3975	3990	3960	4041	4117	3960	4149	4485	3960
Thamesville	19-Nov-2014 09:00	22724	22682	22669	22684	22724	22669	20867	22724	11262	13426	22724	11249
Dingman Cr.	19-Nov-2014 05:00	5019	5009	5000	4997	5019	4974	4950	5019	4913	4919	5019	4899
Reynolds Cr.	19-Nov-2014 09:00	5561	5558	5556	5560	5570	5556	5567	5590	5533	5589	5619	5533
Fainview	19-Nov-2014 09:00	11333	11334	11335	11338	11347	11333	11351	11363	11333	11354	11378	11333
Oxbow Cr.	19-Nov-2014 09:00	4777	4783	4784	4774	4786	4762	4717	4786	4672	4691	4786	4672
Below Fanshawe Dam	19-Nov-2014 09:00	6315	6315	6316	6313	6316	6224	6313	6318	6219	6370	6406	6219
Stoney Cr.	19-Nov-2014 09:00	7021	7017	7015	7022	7028	7015	7028	7037	7015	7032	7075	7015
Orr Dam	19-Nov-2014 09:00	-944	-945	-944	-932	-901	-945	-610	-132	-945	-51	129	-945
Mitchell Dam	19-Nov-2014 09:00	-1192	-1157	-1096	-915	-596	-1219	-321	112	-1219	6	121	-1219
Chatham	19-Nov-2014 09:00	1395	1430	1444	1453	1516	1395	1542	1656	1395	1540	1709	1395
Indian Cr.	18-Nov-2014 13:00	2537	2537	2537	2537	2537	2537	2538	2538	2537	2539	2541	2537
McGregor Cr.	19-Nov-2014 10:00	1062	1067	1067	1072	1080	1062	1070	1098	1027	1081	1098	1027
Upper Avon	19-Nov-2014 09:00	6263	6266	6266	6261	6270	6250	6249	6299	6180	6190	6299	6162
Fish Cr.	19-Nov-2014 09:00	3392	3393	3394	3392	3396	3389	3402	3416	3389	3395	3426	3374
Below Wildwood Dam	19-Nov-2014 09:00	5836	5835	5836	5835	5836	5834	5836	5844	5832	5840	5847	5832
Springbank Dam U/s	19-Nov-2014 09:00	1407	1409	1408	1427	1465	1405	1459	1489	1405	1514	1554	1405
Springbank Dam D/s	19-Nov-2014 09:00	1423	1425	1425	1442	1476	1421	1426	1481	1392	1444	1481	1392
Tavistock	19-Nov-2014 09:00	1711	1720	1731	1705	1735	1657	1669	1735	1652	1660	1735	1645



SODA data Acquisition



Future Directions

- Fully implement kiWQM water quality module
- Implement recently available REST-API
- Integration with GIS system
- kiECO benthic module
- South Western Ontario “Hub”



Questions?

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