

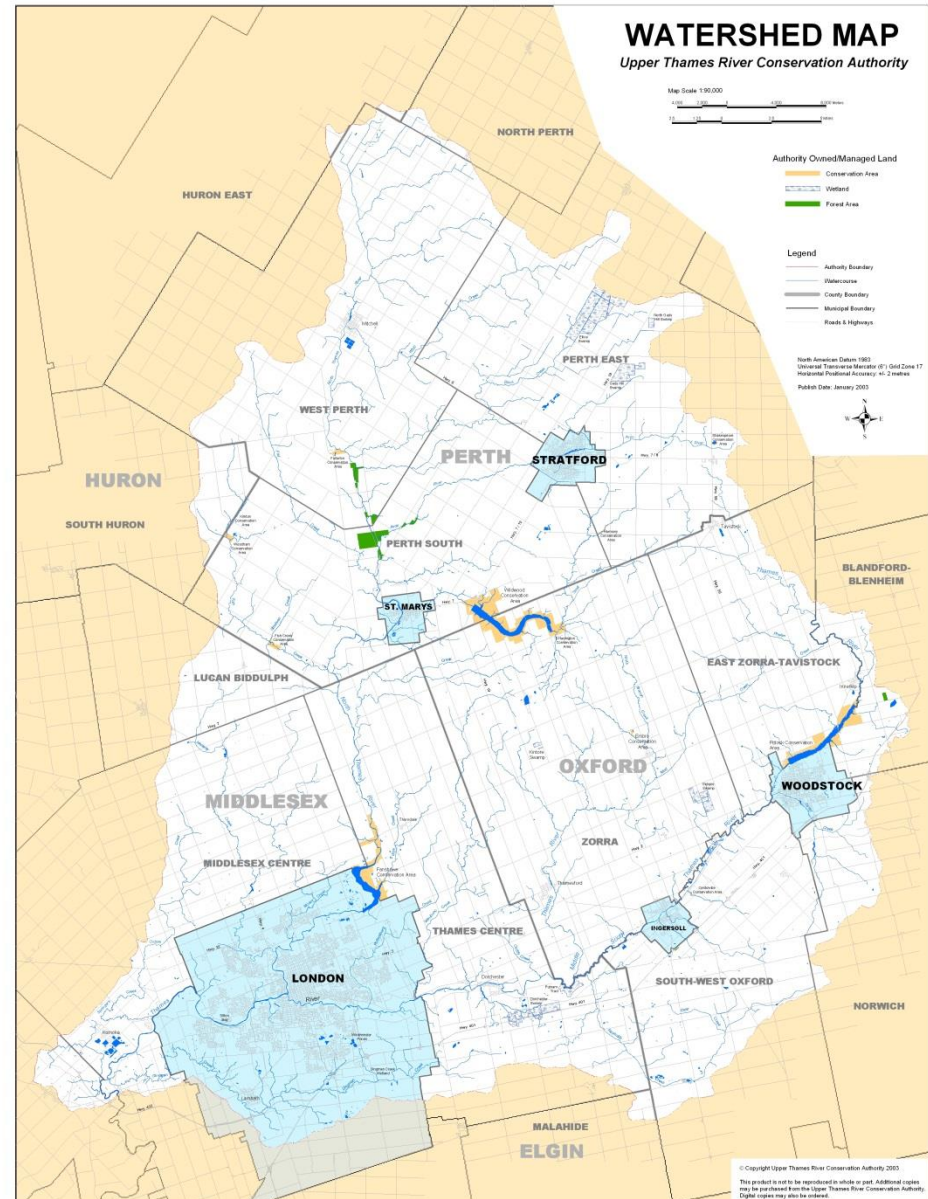
Floodplain Mapping Update Efforts in the Upper Thames

Mark Shifflett P.Eng.
Upper Thames River
Conservation Authority



Upper Thames River Watershed

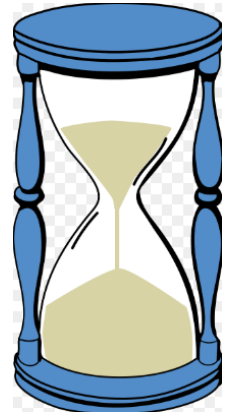
- 3,400 square kilometres
- 470,000 residents
- Mix of rural and urban land uses
- Drains to Lower Thames
- Flood Standard
 - 1937 Flood
 - 0.4% Probability
 - (ie. 250yr return period flood)



Floodplain Mapping Update

Basic Process

- Hydrology
- Hydraulics
- Map



Floodplain Mapping Update

Additional Considerations

- Communications/Consultation – (ie. change management)
 - Public
 - Landowners
 - Developers
 - Politicians
 - CA Planning & Regulations Staff
 - Municipal Planning and Engineering Staff





Flood Forecasting and Warning 'Renewal'

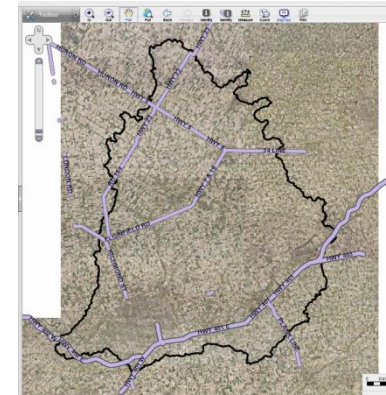
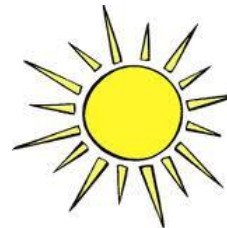
UTRCA Board of Directors – 2011



There is a Need



- Majority originally developed in 1980s
 - Little re-investment since
- Software / Hardware advances
- Increased amount and quality of data
- Physical changes to watershed
- Lack of model documentation
- Climate change



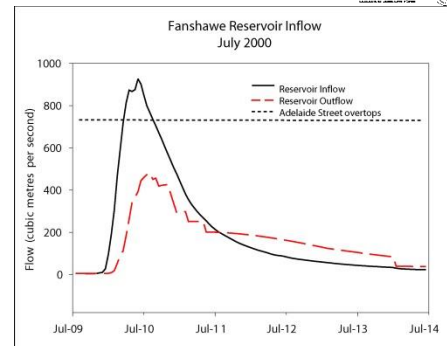
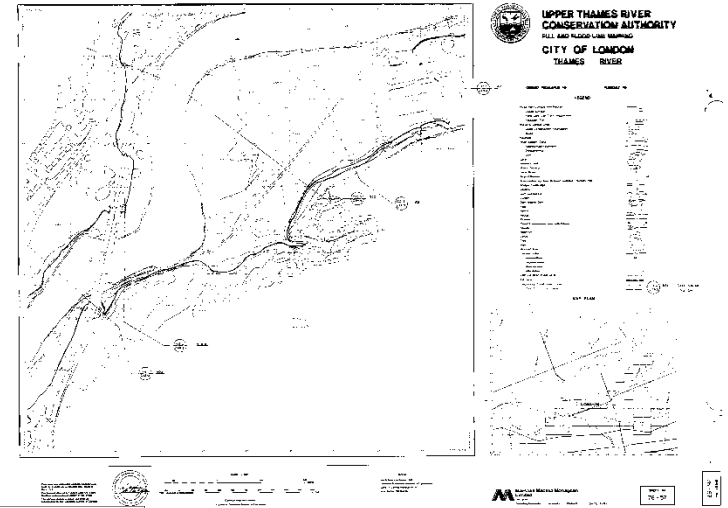
Context – Issues

- Staffing and Succession
- State of the Science
 - Data Management
 - Hydrologic and Hydraulic Models
- Climate Change



Flood Modelling & Mapping Applications

- Regulations / Planning
- Forecasting
- Specific Project Support



Renewal

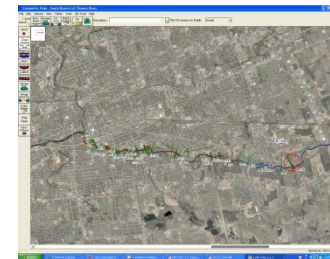
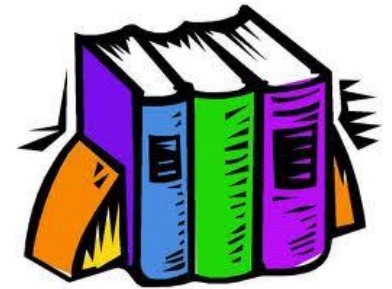
1) Establish clear library of 'best-available' models / results

– Fully document

2) Establish models in modern software

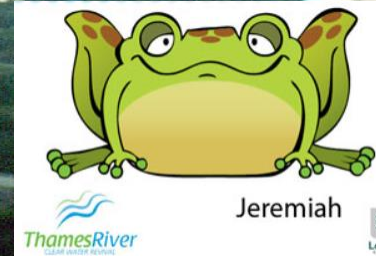
– Update

3) Expand functional capabilities



Flood Forecasting and Warning 'Renewal'

- UTRCA Board of Directors
 - 2011 Full Support
 - (no new \$ requested)



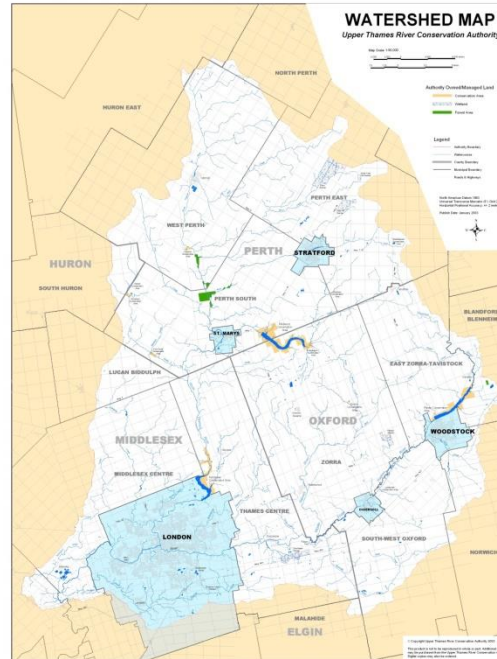
Renewal Beginnings...

- 1 Full-time Contract Staff
- Seasonal Field Survey Crew

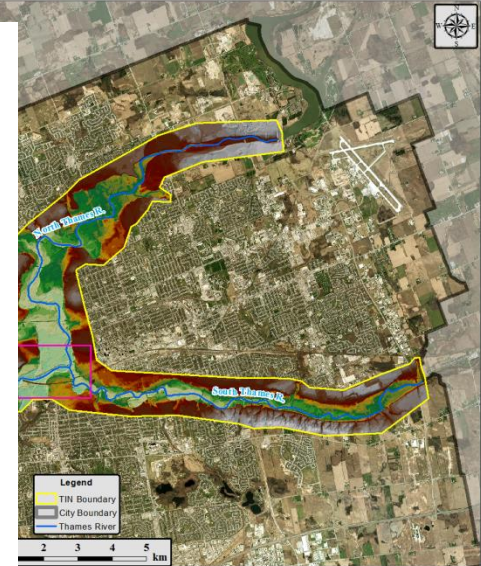
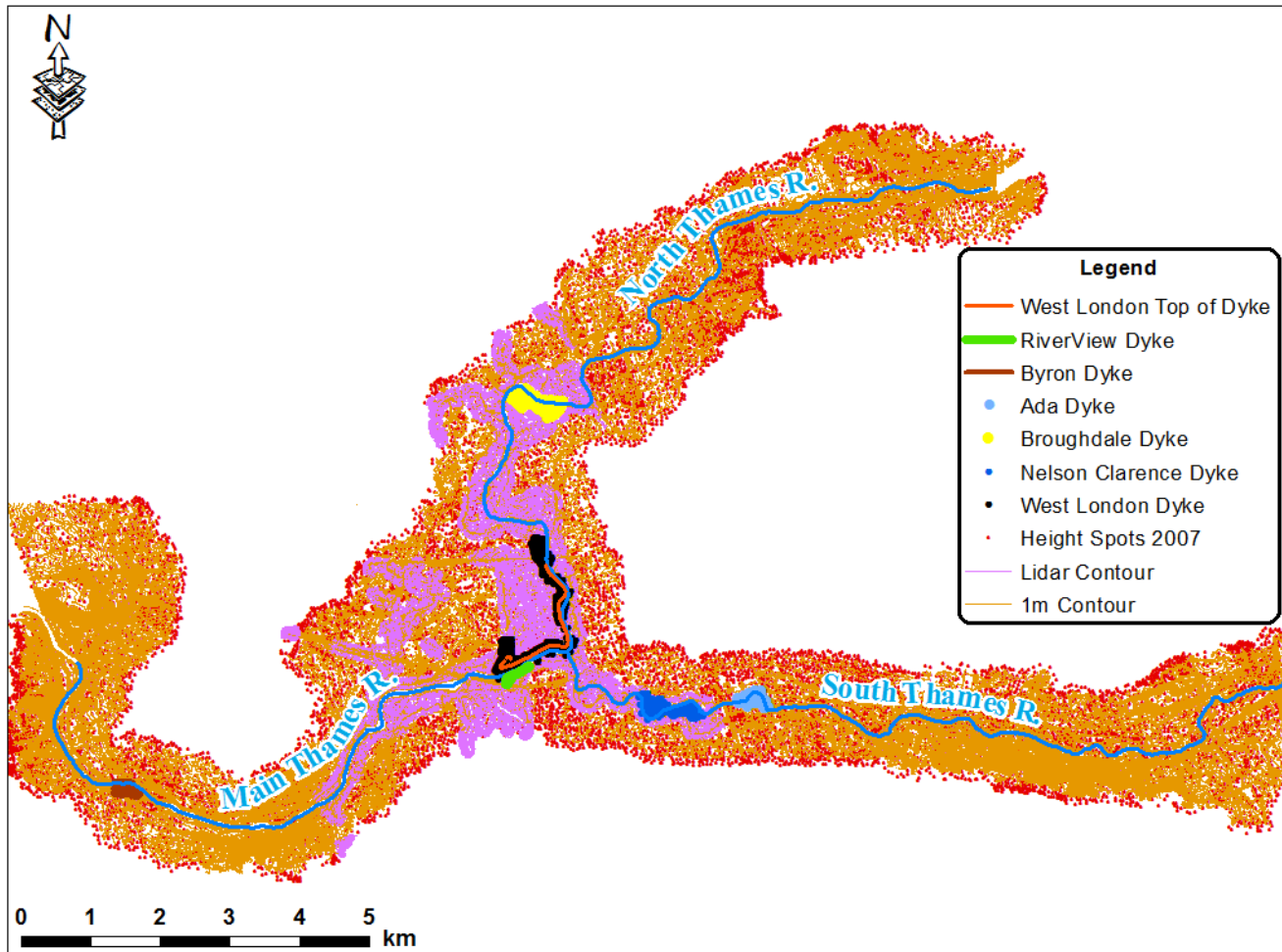


Where to Start ?

- Methodical vs Short-Term Needs (and \$\$\$)



Hydraulic Modeling – Digital Elevation Model (DEM)



- SWOOP2010
- London DEM2013...
- SWOOP2015

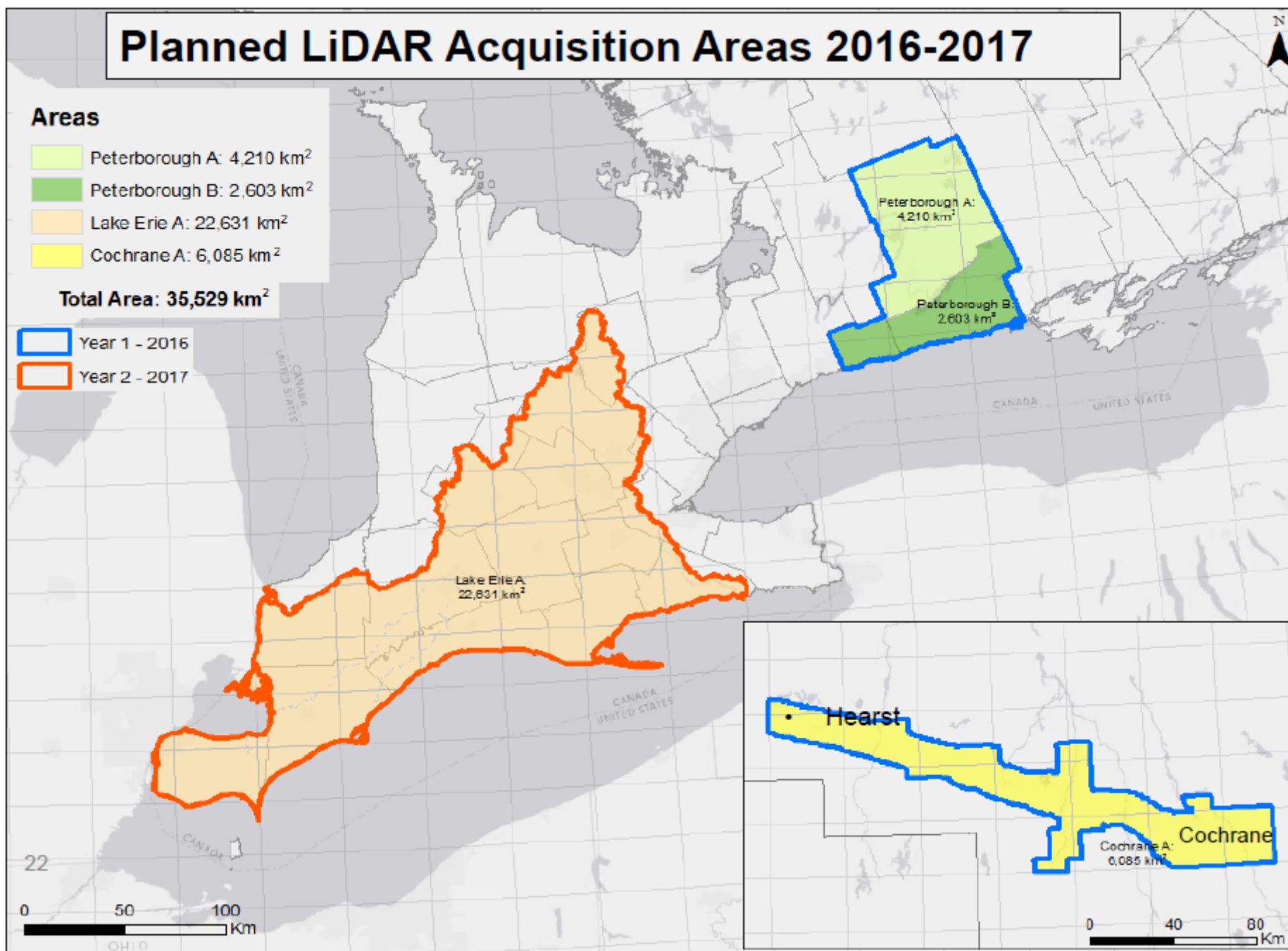
Planned LiDAR Acquisition Areas 2016-2017

Areas

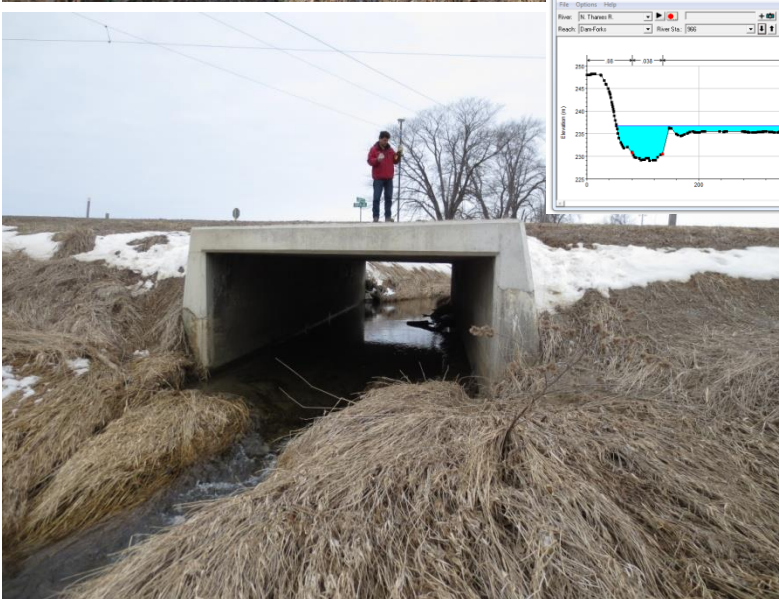
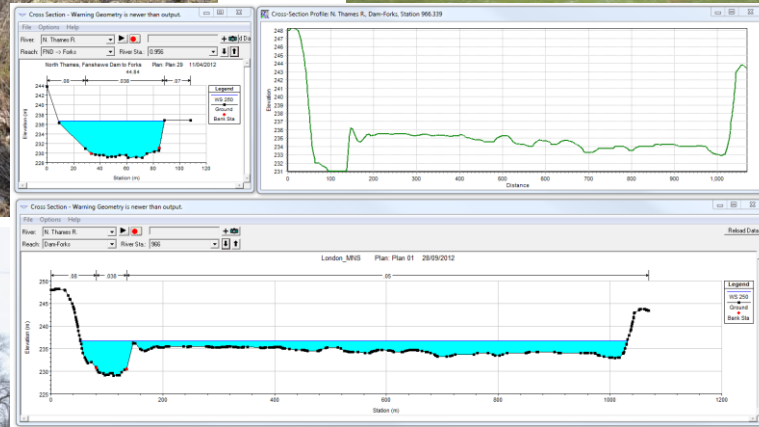
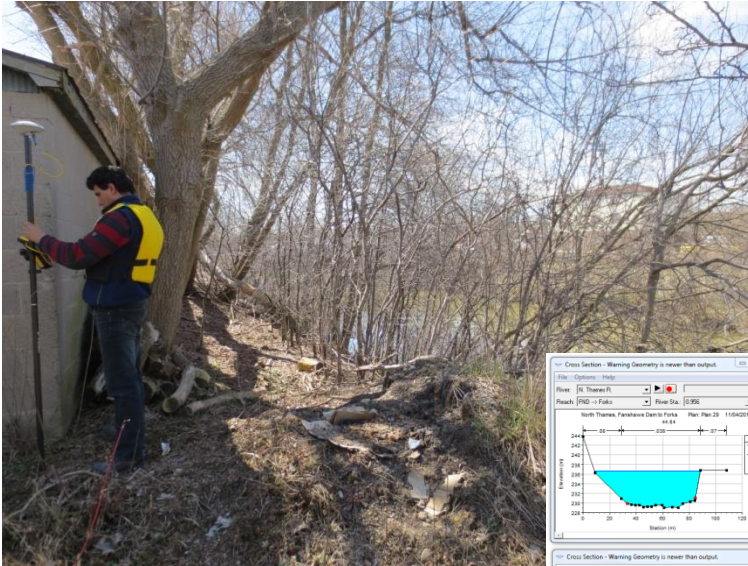
- Peterborough A: 4,210 km²
- Peterborough B: 2,603 km²
- Lake Erie A: 22,631 km²
- Cochrane A: 6,085 km²

Total Area: 35,529 km²

- Year 1 - 2016
- Year 2 - 2017



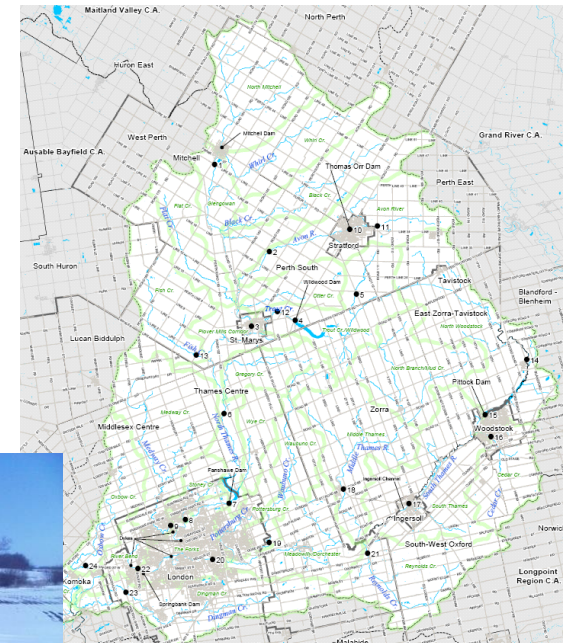
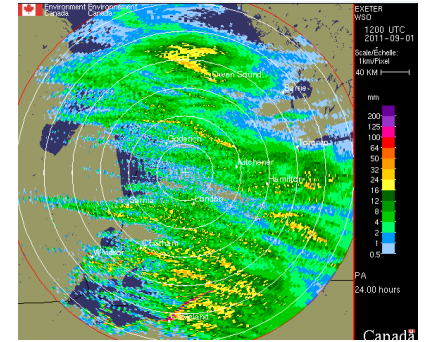
Hydraulic Modeling - Field Survey





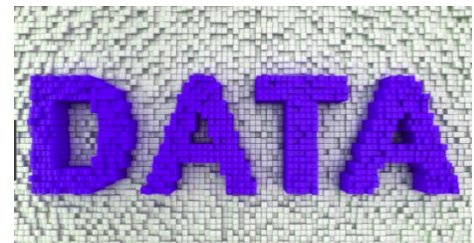
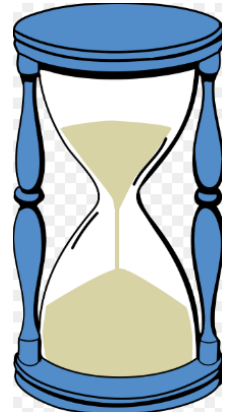
Hydrology

- Mud Creek PC-SWMM Model
 - 8km²
- Statistical Flow Analysis Update
 - Regional Analysis

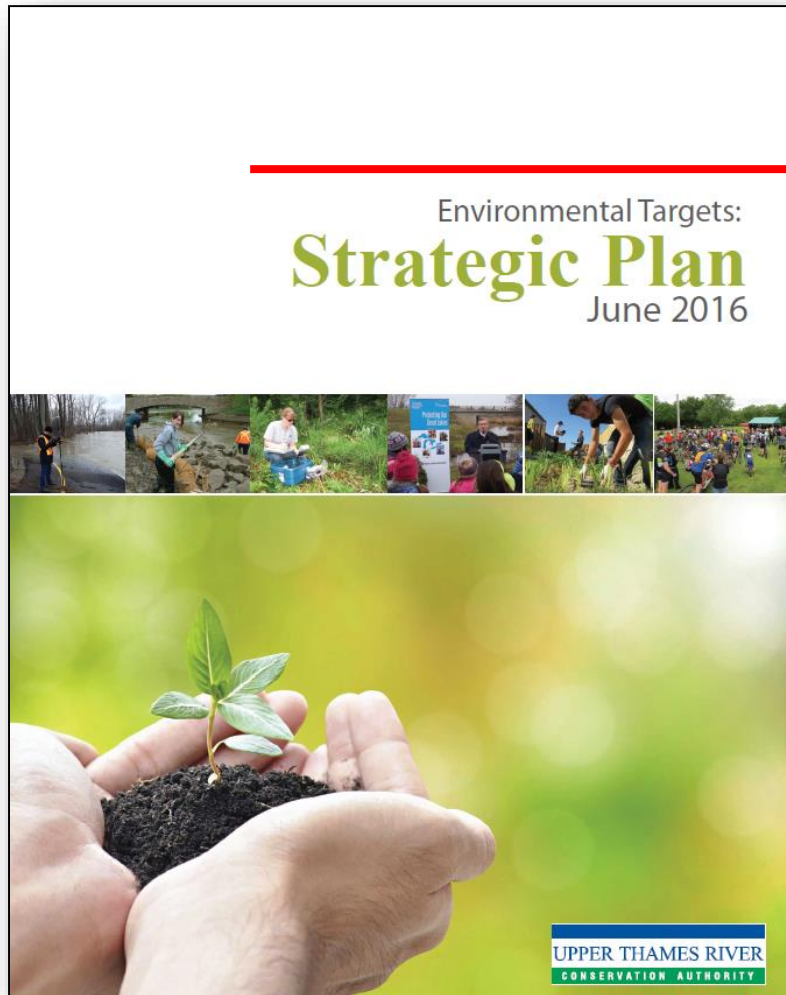


Floodplain Mapping Update 'Renewal' Progress

- Hydrology
- Hydraulics
- Map

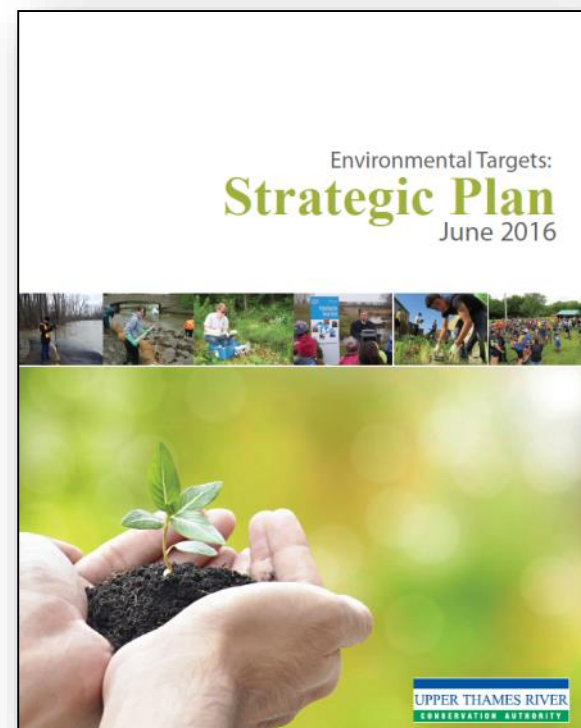
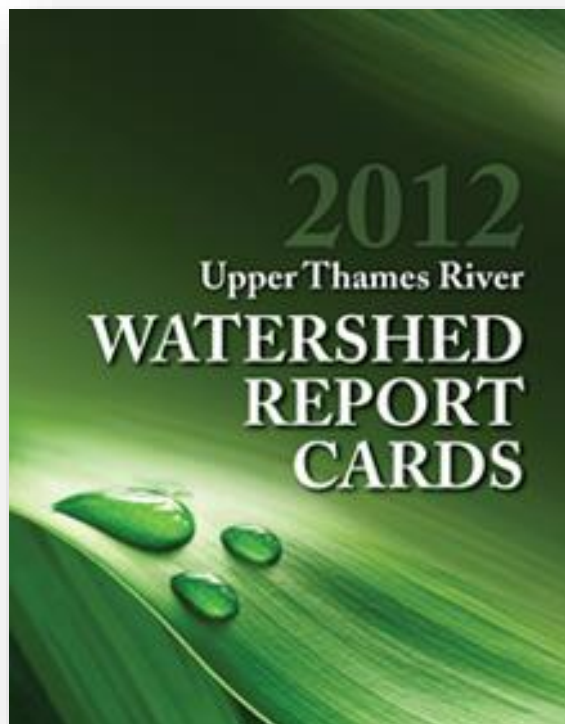
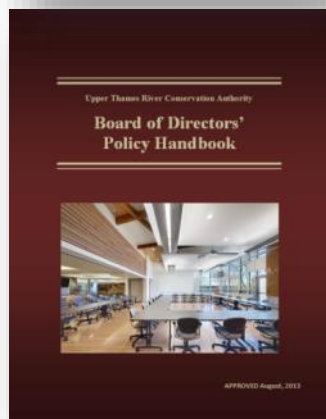
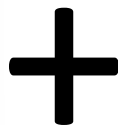


Environmental Targets as a Strategic Plan



“Strategic Doing”





What we **SHOULD** be doing:

- Improve
- Expand
- Cleaner
- Safer

How we **ARE** doing:

- So-so
- Status Quo, at best

**Plan to DO MORE.
(Double!!)**

1. To Manage and Expand Natural Areas.

Target: Establish and restore 1,500 hectares (3,700 acres) of natural vegetation cover, windbreaks and buffers by 2037.

About the target:

- Establish 1000 hectares of new natural vegetation cover (equivalent to twenty-five 100 acre farms).
- Restore 500 hectares of existing vegetation cover.
- **Double** the effort and impact of current planting and restoration programs.



2. Protect and Improve Water Quality

Target: Increase Each Subwatershed's Water Quality Score by one grade as measured by UTRCA Watershed Report Cards by 2037.

About the target:

- Current grades are exclusively Cs and Ds. There is room for improvement.
- **Double** scope of Rural Stewardship Programs (e.g., Clean Water Program)
- **New** Urban Stewardship Program (e.g., LID)



3. Provide Outdoor Recreation/ Education Opportunities

Target: By the year 2037, reach 1 million people annually with conservation messages through their access to UTRCA lands and through the demonstration of green infrastructure.

About the target:

- Expand from the current ~700,000 visits/yr, to 1,000,000 (equivalent of two visits/year for every watershed resident.)
- Demonstrate and showcase conservation messages and practices.

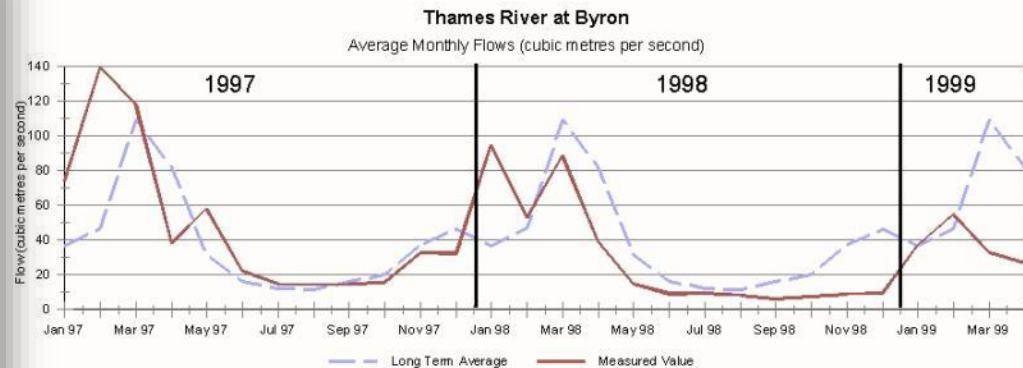


4. Protect Life and Property from Flooding and Erosion.

**Target: 1) Update watershed flood models and regulatory mapping for the watershed by 2020.
2) Then integrate climate change scenarios into these updated models and develop adaptation strategies for all subwatersheds by 2030.**

About the target:

- **Work is underway.**
- **Legal and moral responsibility to use best available information.**
- **Earlier deadlines than other Targets.**



Key=



Existing programs and services are effective.
Simply need to **DO MORE**.
That requires **MORE MONEY**.



Selling It to the Board:

- Report Card information provided justification to do more. No argument from Board.
- Debate was how quickly we could implement.
- Board did demand monitoring and reporting regarding the plan's progress and well as a willingness to adapt.

Selling It to Municipalities:

- Extra effort. Council Tour.
- No argument regarding need.
- Concern regarding who pays and how quickly.
- Some limited but aggressive push-back; different priorities.

Senior government is next...

National Disaster Mitigation Program (NDMP) 2016-2020



- Provide 50% funding for floodplain modelling & mapping projects
- Good timing with UTRCA Environmental Targets funding

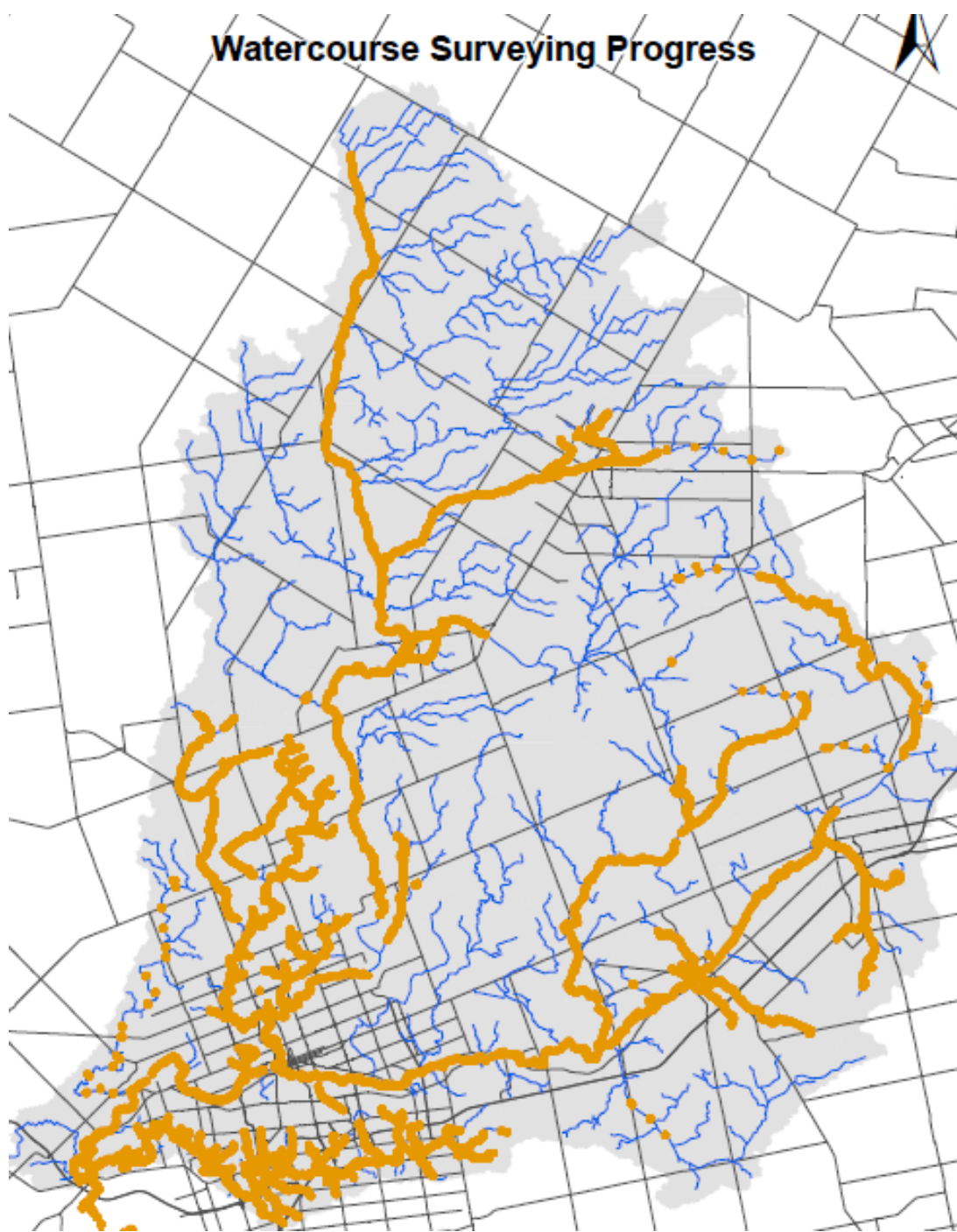


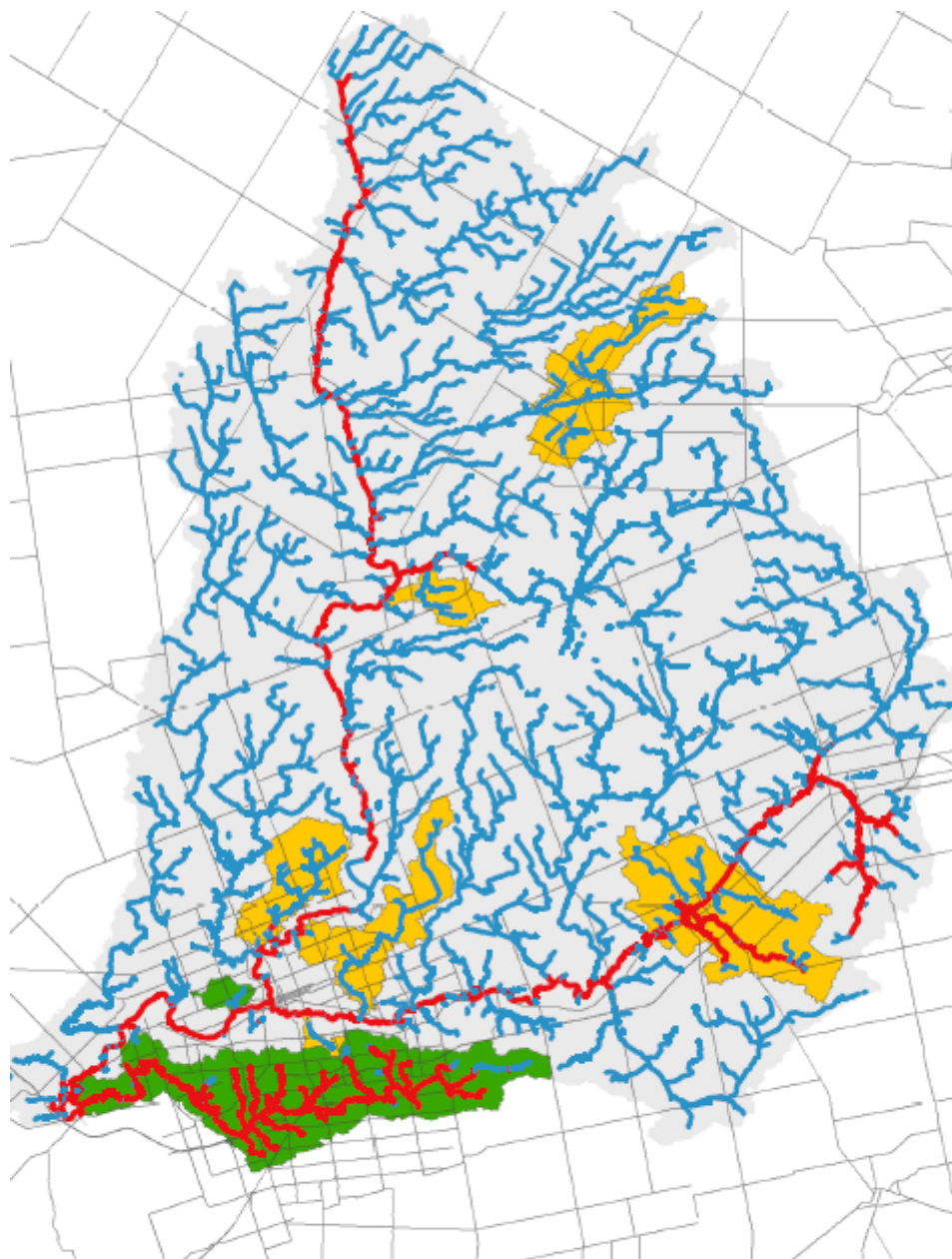
UTRCA Floodplain Modelling & Mapping Update Project - 2018

- 4.5 Office staff dedicated to project
 - 3.5 engineering staff
 - 1 GIS staff
- 2 Seasonal Survey Crews



Watercourse Surveying Progress





Legend

Hydrologic

Modelled

Not Modelled

Hydraulic

Modelled

Not Modelled

Modelling Progress

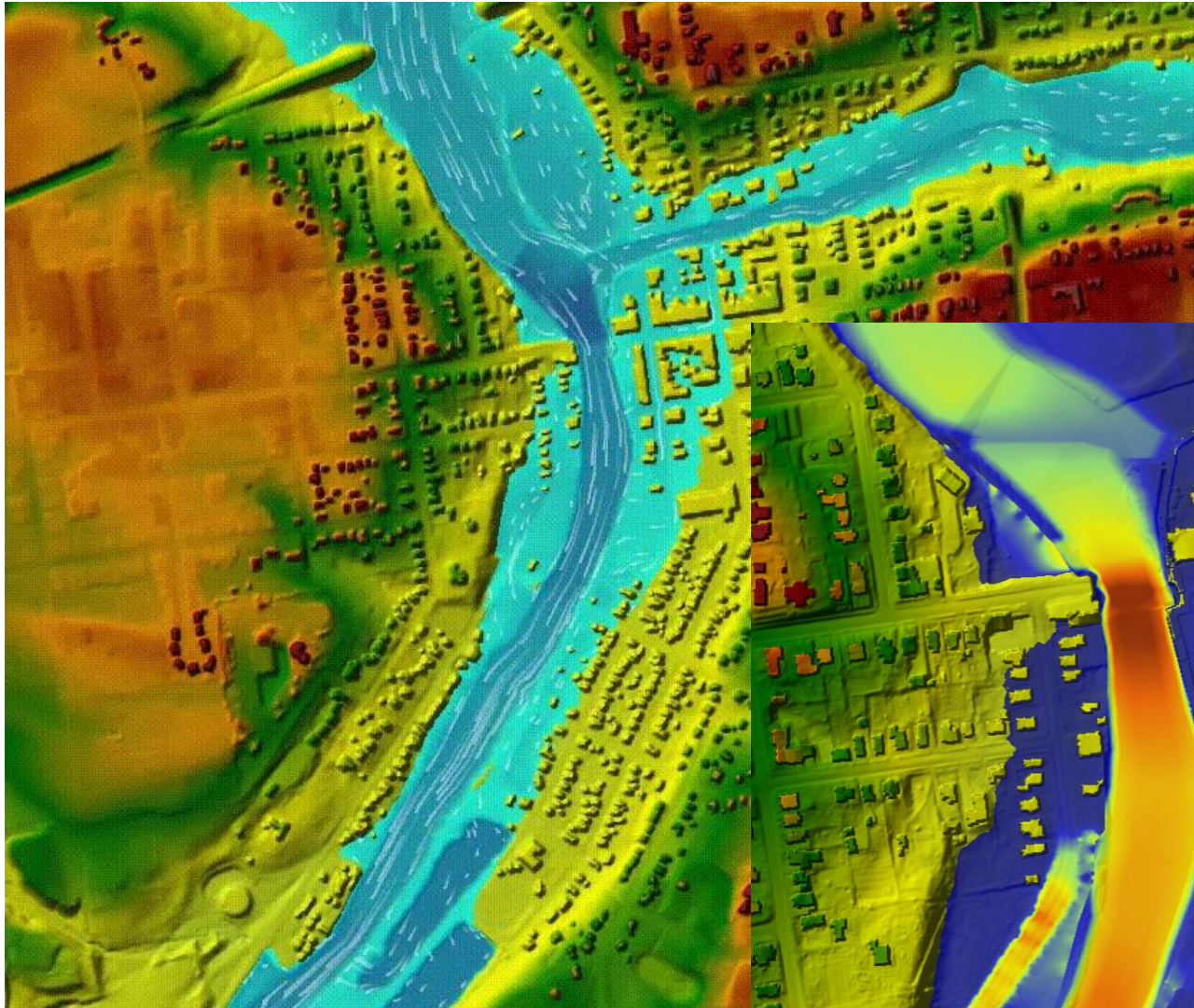


UPPER THAMES RIVER
CONSERVATION AUTHORITY

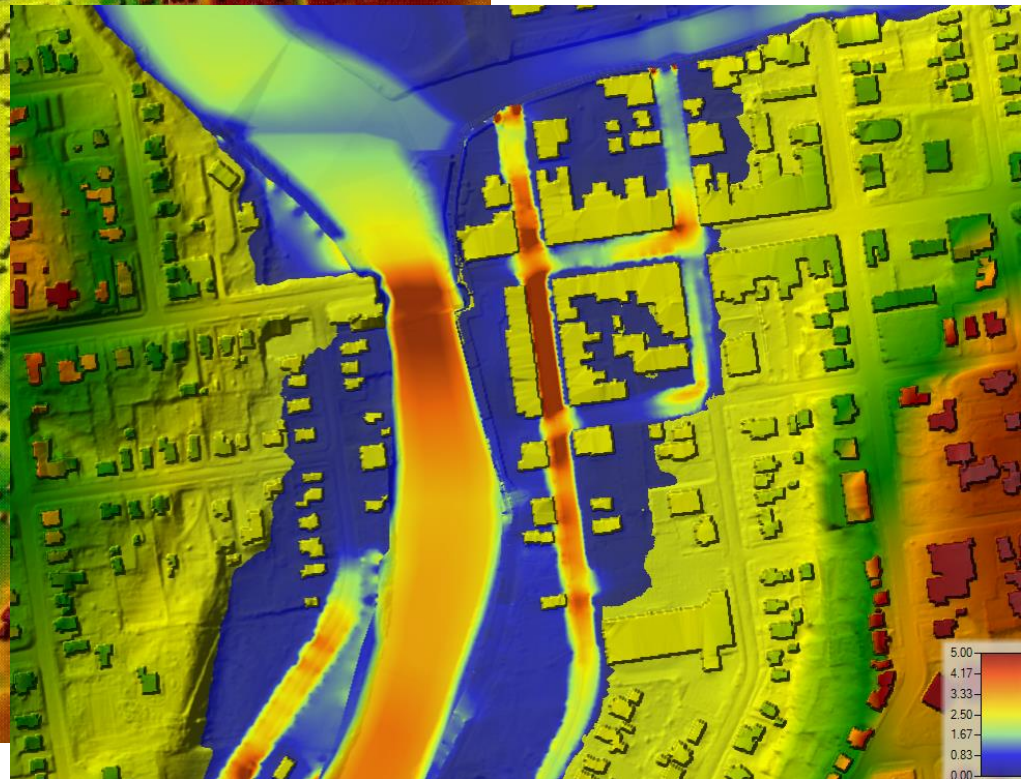
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Kilometers

2D Hydraulics

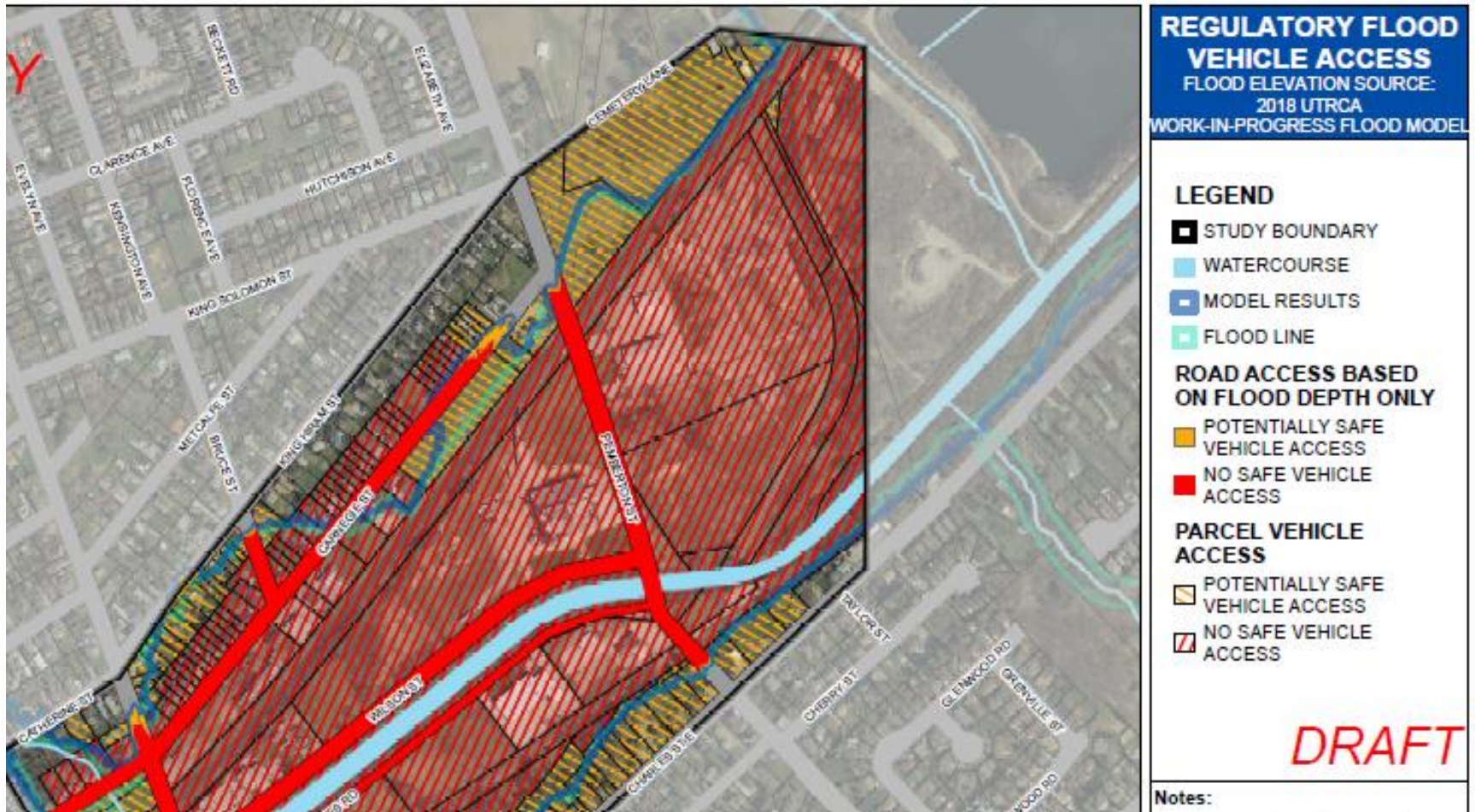


Velocity



New Mapping Products

– eg. Ingress/Egress



Communications / Education

<https://www.youtube.com/watch?v=hplu05tp83w&list=PLFpWBhiQtDo5OILhmCuPX4dJGWcQzmzBN&index=4&t=0s>

Questions ?

