

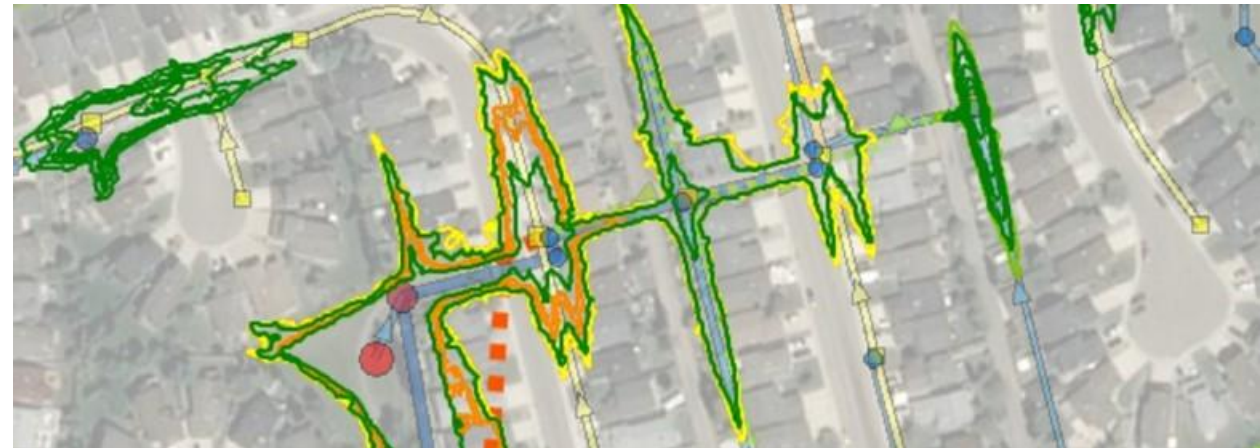


# City of Calgary

Emerging through Darkness  
(Pluvial Flood Mapping)

Brad Larson, P.Eng.

Santosh Nishtala, M.Eng. P.Eng.



- Bare minimum Data
  - Plan profile drawings
  - Asset data on GIS
- Models, if any, are not uniform or consistently built or outdated software
- Consultants needed to better understand the system performance



# Citywide Phase 1 & 2 Outcomes

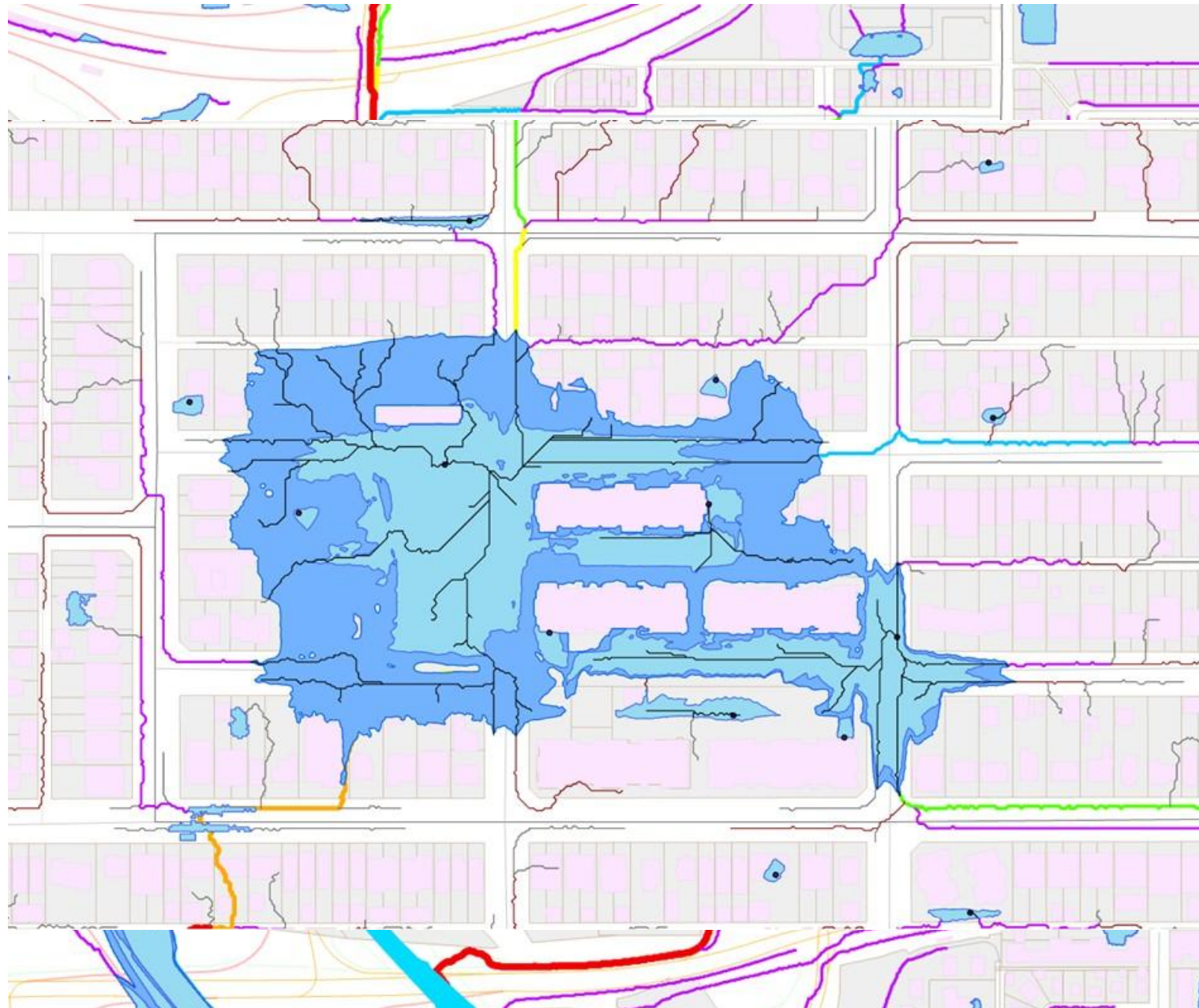
- **Mapping Tools**

- Trap Lows & Streamlines, detailed 5cm contouring
- Leverage 2018 & 2022 LiDAR
- City-Wide coverage

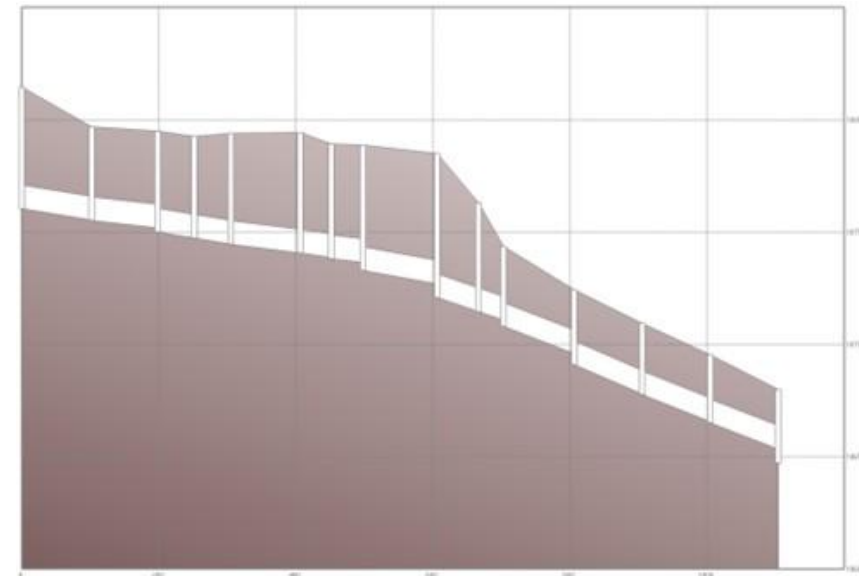
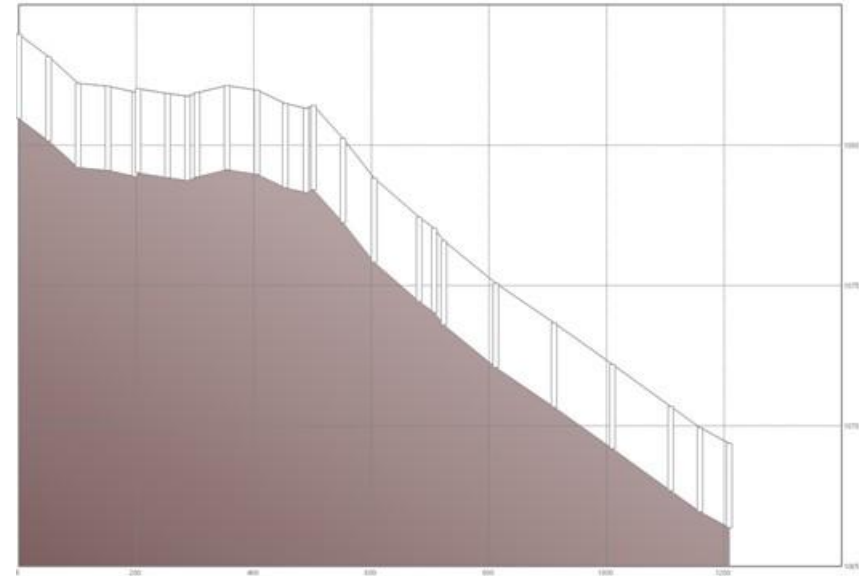
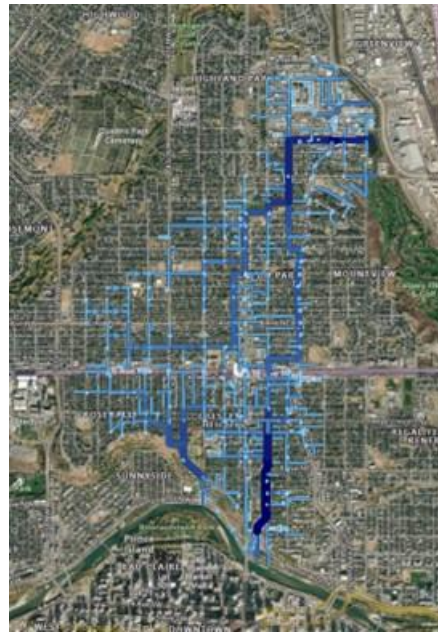
- **PCSWMM Modelling**

- Consistent model builds, made by automation
- 40 x 1D-1D Models for residential areas
- 7 x 1D-2D models for commercial & industrial areas

# Streamlines & Trap Lows



# 40 x 1D-1D Model Overview (PCSWMM)

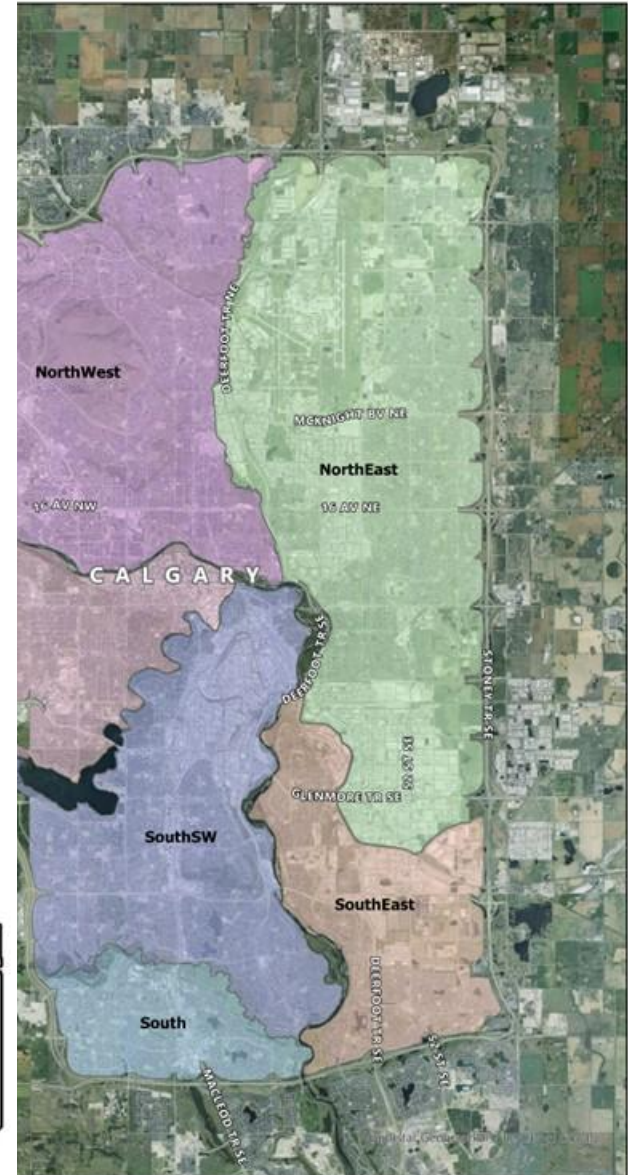
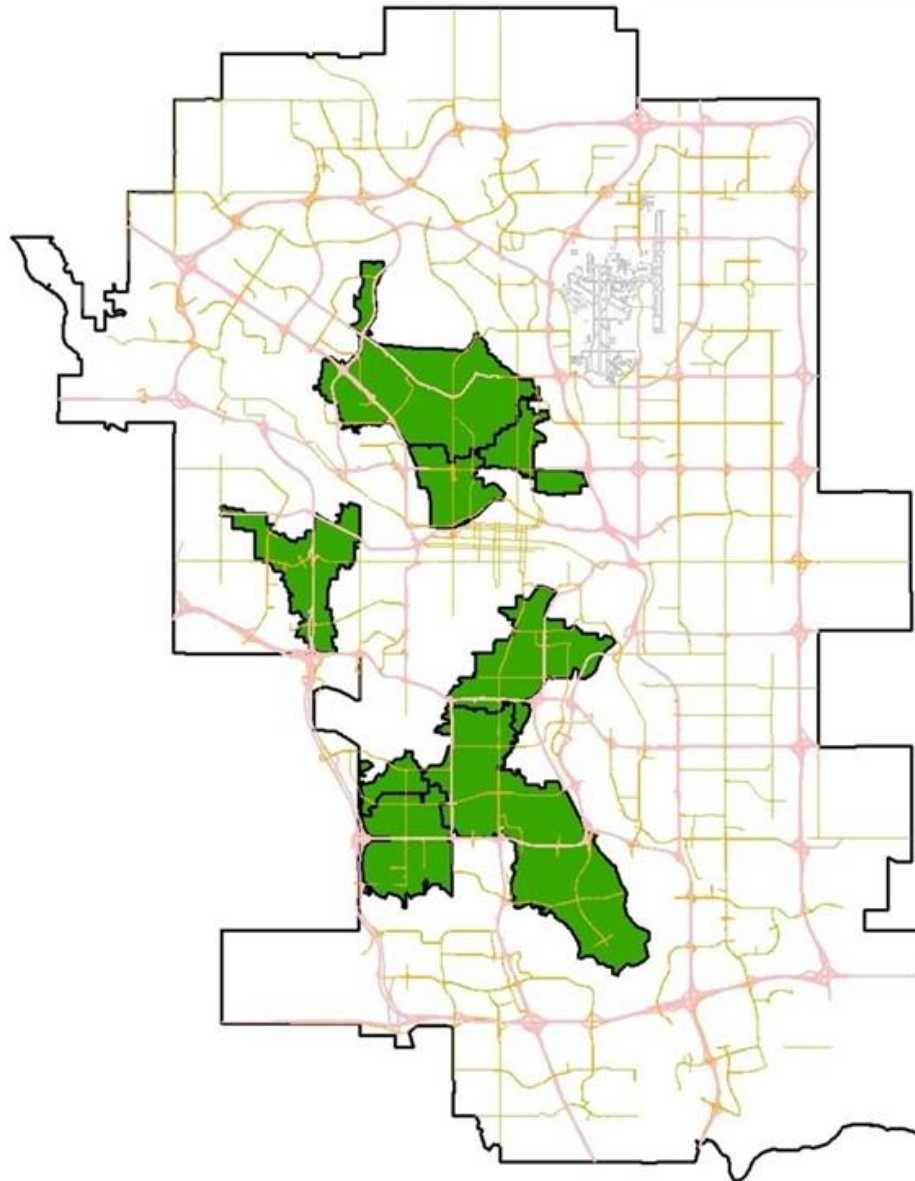
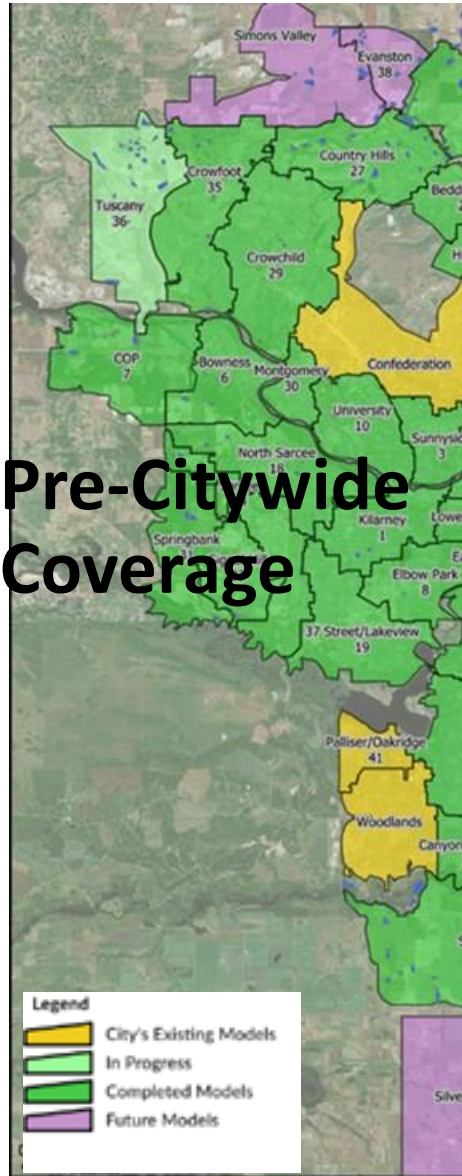




# Citywide Project Outcomes

PCSWMM 1D & 2D

Pre-Citywide Coverage



# PCSWMM 1D-1D Vs InfoWorks ICM 1D-2D Model

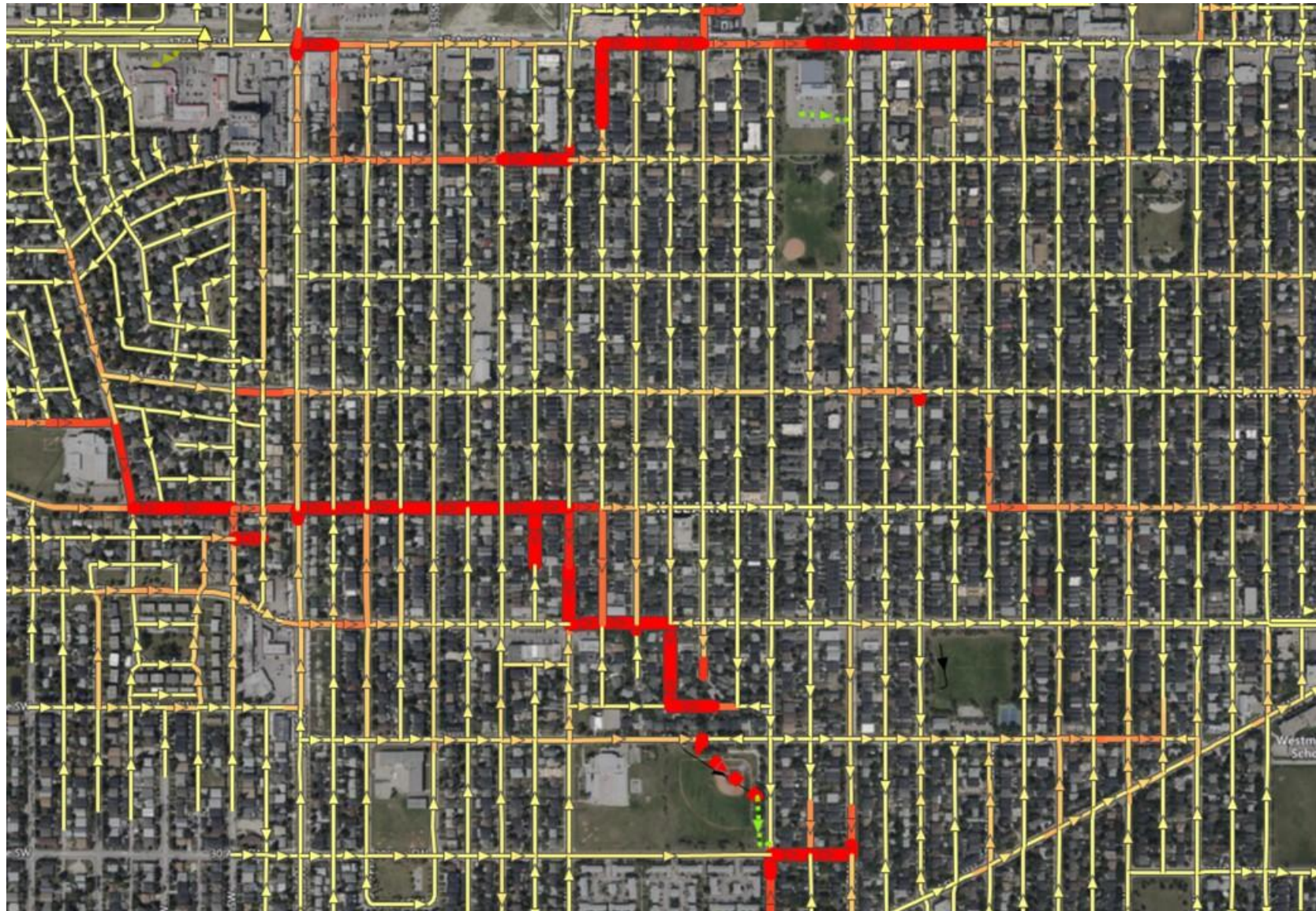
PCSWMM



InfoWorks ICM

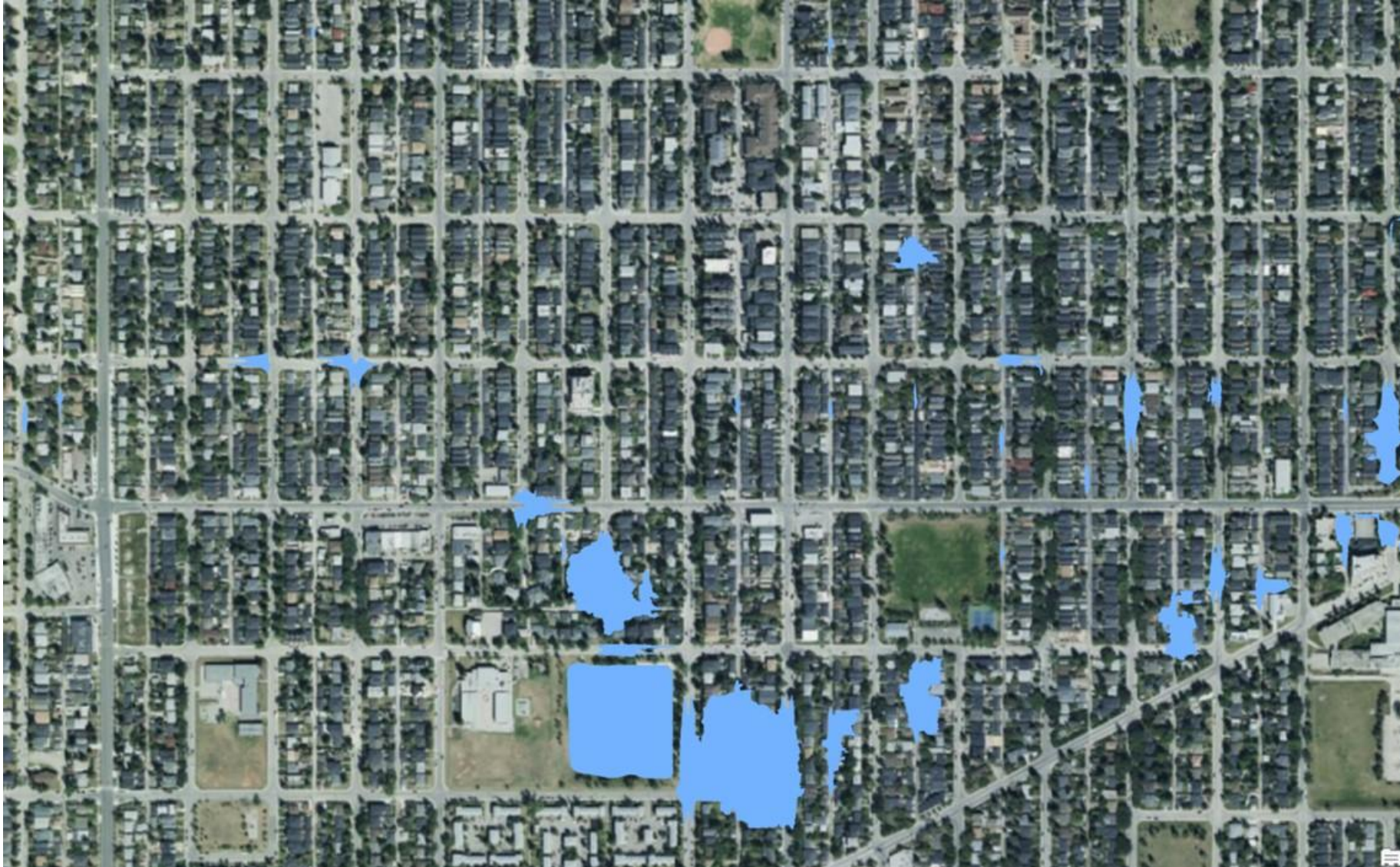


# 1D-1D PCSWMM Model Results - Overland

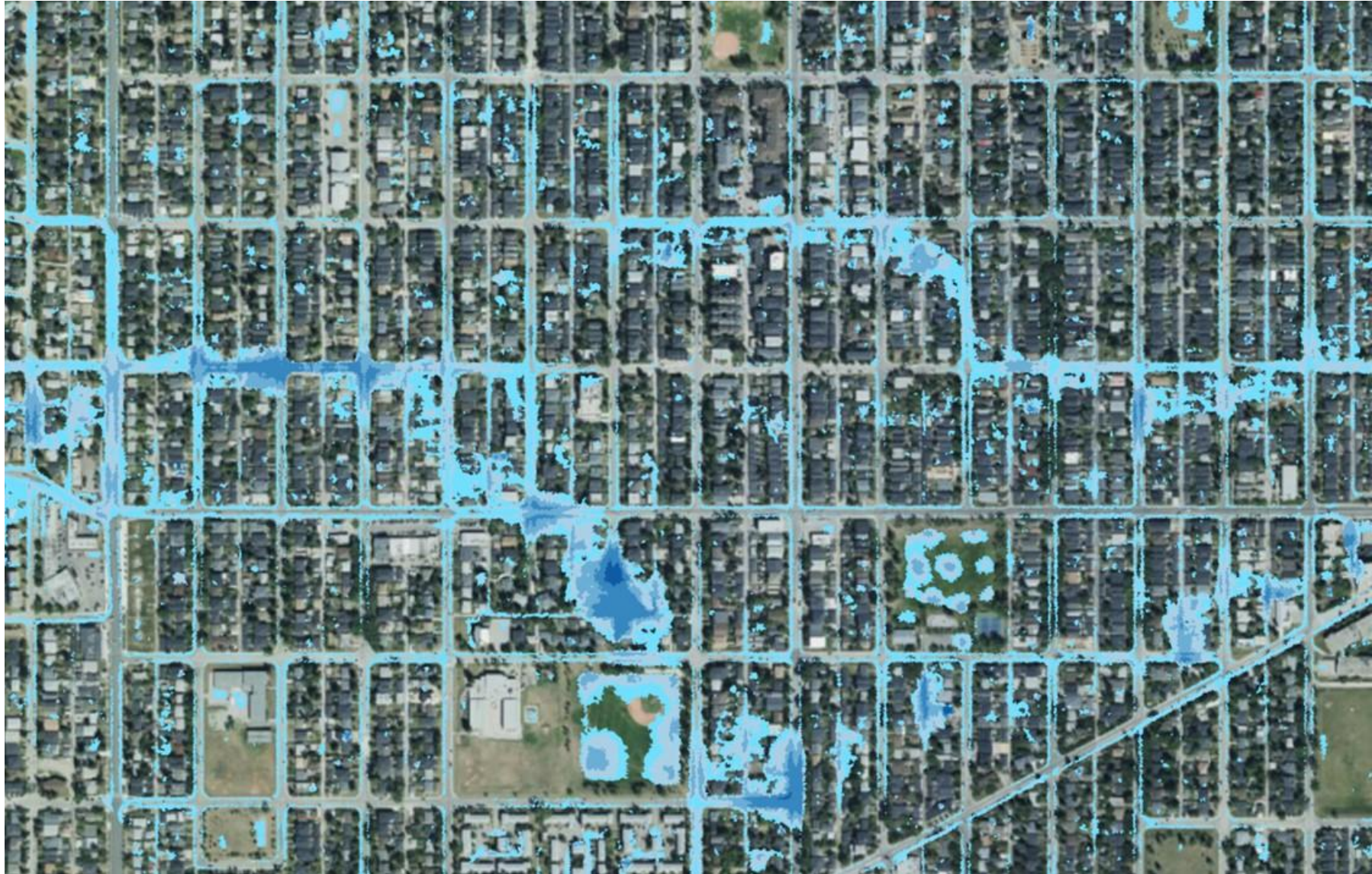


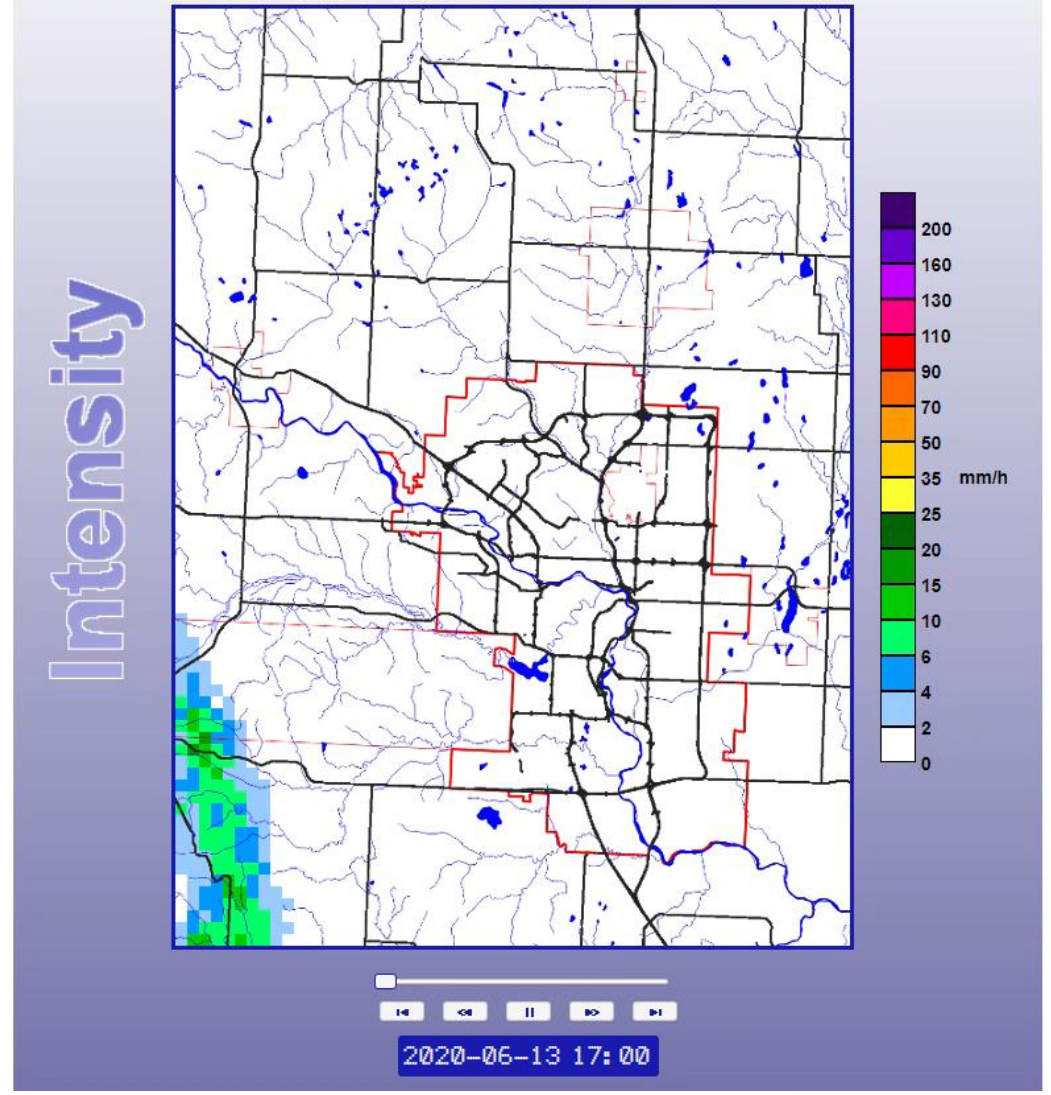
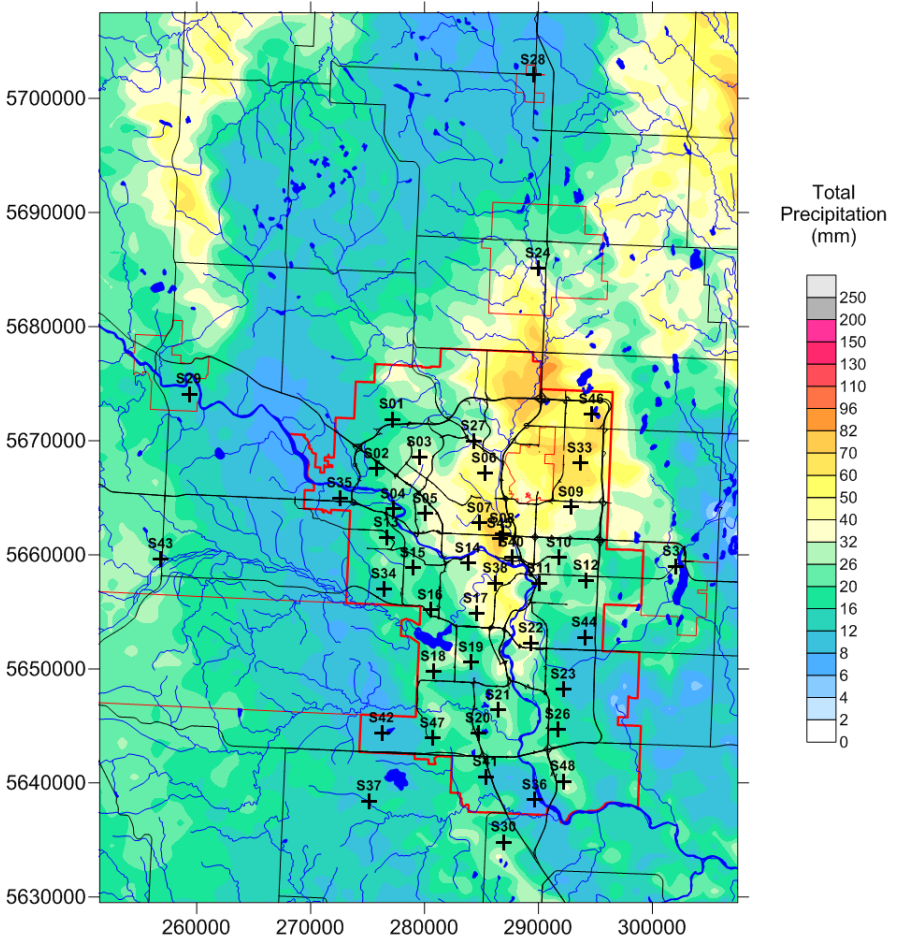


# 1D-1D PCSWMM Model – Mapped to Trap Low Extents



# ICM 1D-2D Model Mapping





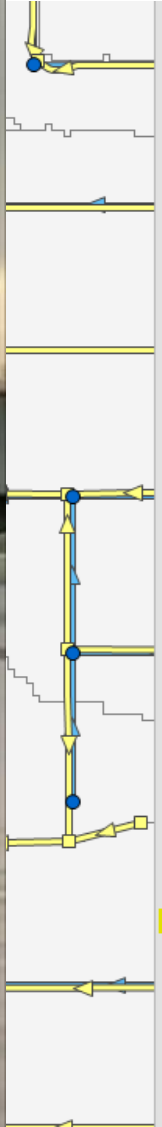
Total Precipitation for June 13-14, 2020 period 17:00 to 0:00 MST

Total Precipitation Based on Adjusted Strathmore (CSSM) Radar Data

Features mapped using the UTM Projection ( NAD83 ) and expressed in meters.

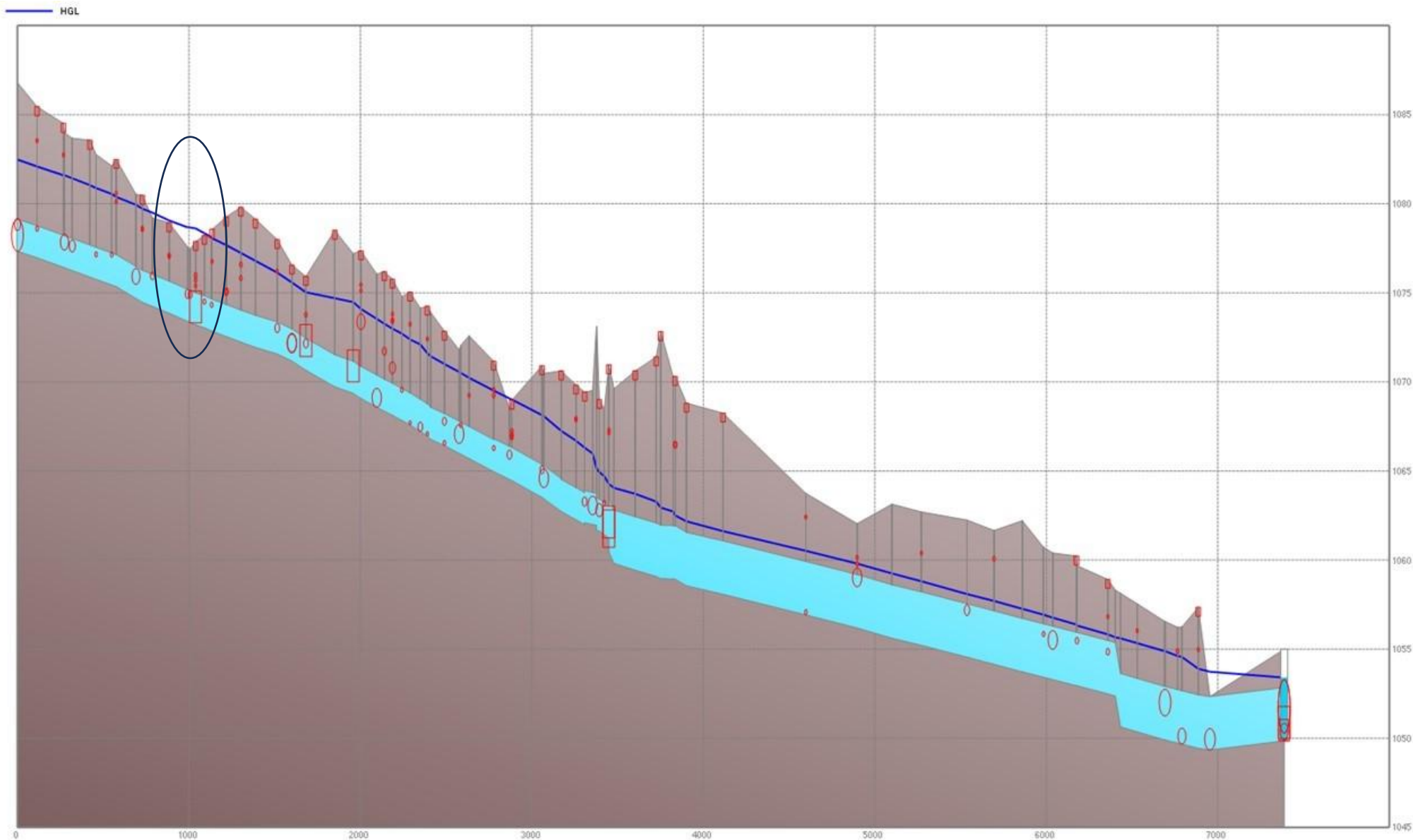
56 --- Rain Gauge ID  
+ --- Location  
--- Ptot Gauge

# 68 Street NE & 37 Avenue NE



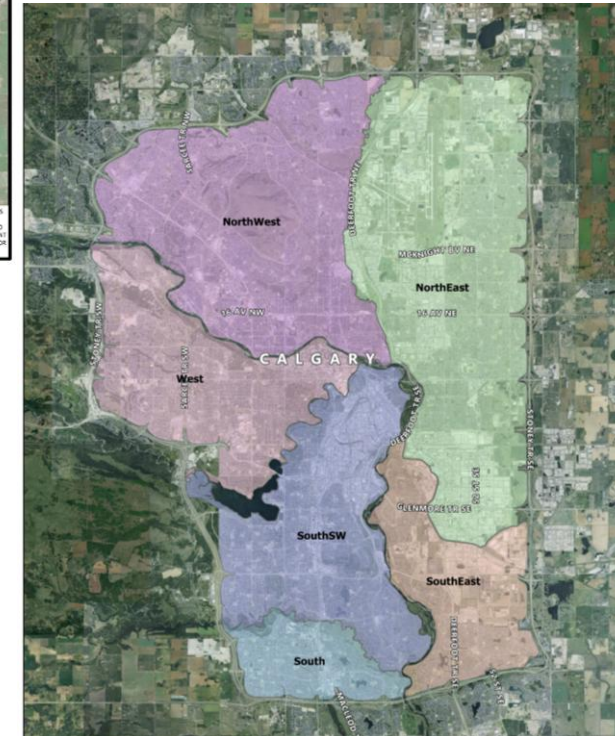
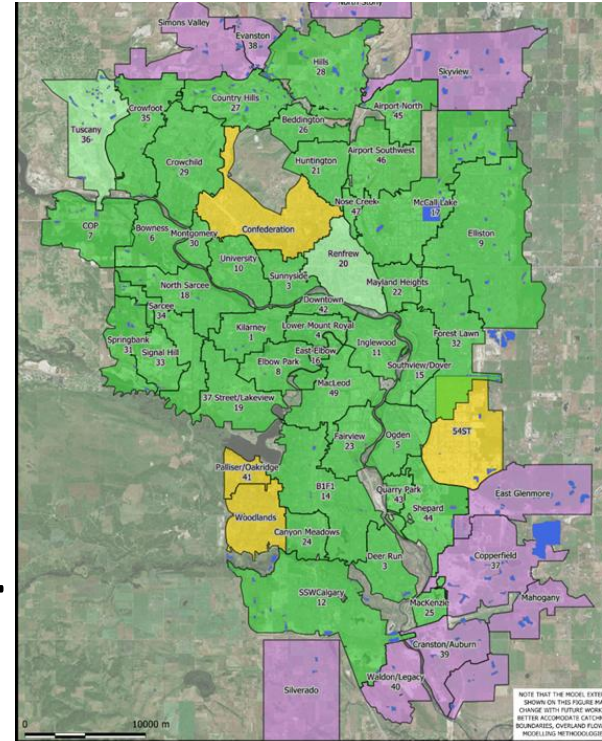


# 68 Street NE & 37 Avenue NE



# Close the Loop – In the Light now!

- Visualized GIS Data Citywide:
  - TLs
  - SLs
  - 5cm Contours
- 47 1D & 2D PCSWMM Models
- 6 InfoWorks 2D Models (**to be built in-house**)
- Consistency across models
- Better understanding of problems

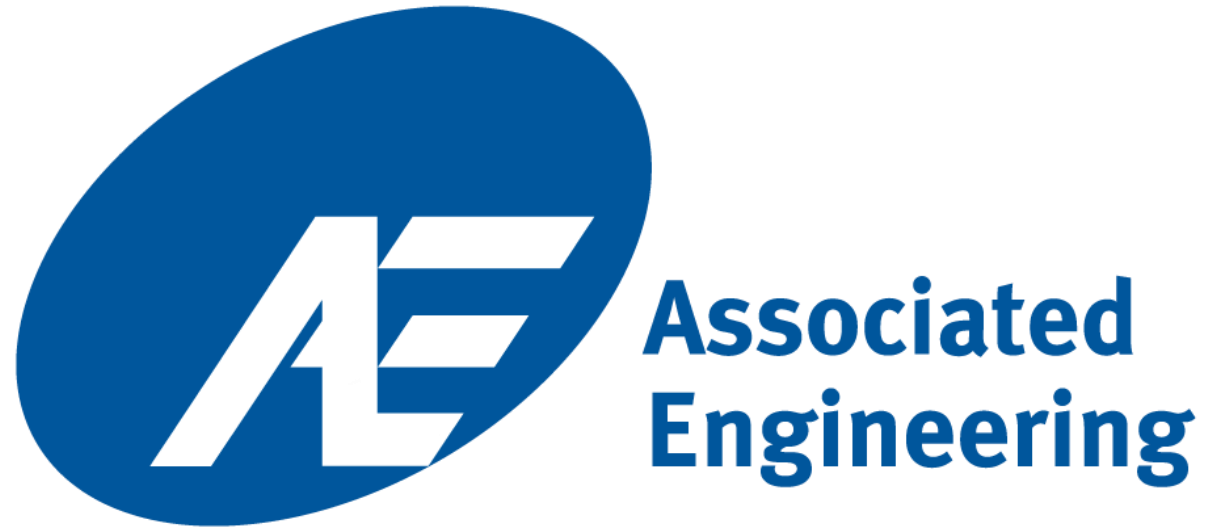


# Practical Applications & Next Steps

- GIS based risk analysis - Identify service needs
- Advance key infrastructure



- Associated Engineering
  - Andrew Rushworth
  - Andrew Wiens
  - Laurel Fowler
  - Carmen Janzen





# Questions

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Santosh Nishtala, [santosh.nishtala@calgary.ca](mailto:santosh.nishtala@calgary.ca)