Automation for Efficient Flood Mapping

Simon Laird
Principal Consultant | Services Lead
1Spatial
www.linkedin.com/in/-simonlaird

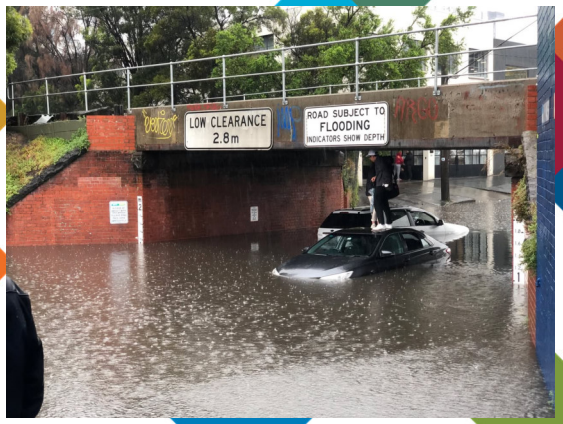
Background

- Why is this important?
- What does it provide us with?
- How are the outputs utilised?

Source: Unsplash

Some recent (Melbourne) events

- Extreme weather events can happen anywhere, anytime.
- Public and Media interest has increased of late.



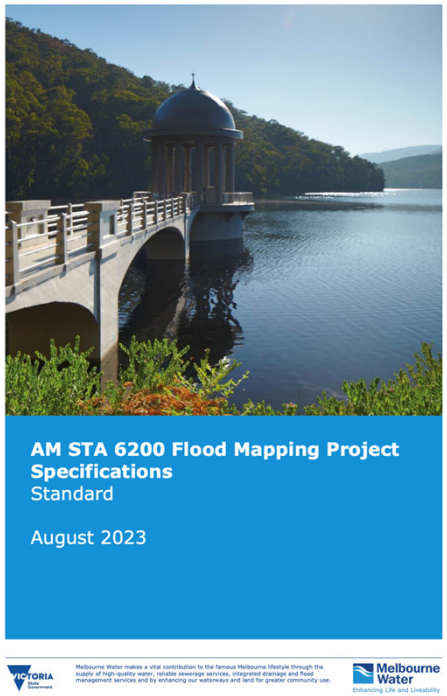
February 2021 Source: ABC News


Maribyrnong Flood Event October 2022 Source: The Age


Flinders Street 2010 Source: Melbourne Water

Flood modelling - the process

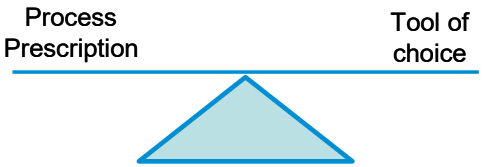
- Melbourne Water defined process.
  - Standards to follow
  - Input data
  - Hydrological/Hydraulic modelling process
  - Outputs
  - QA
- Interdisciplinary Collaboration: Effective flood modelling often requires collaboration between hydrologists, flood engineers, GIS specialists, and other experts.



The Challenges

- Modelling flood events can be complex, no two events are the same and minor changes to input variables can have significant impacts.
- Balance is required in the methodology
  - Prescriptive standardisation, versus
  - Flexibility
- Consistent outputs are required
- Lots of data

Source: Unsplash



Automation, where it's beneficial

- Where are the automation opportunities?
  - Many scenarios: (1 in *n* year) * {*climate scenario*}
  - Significant quantity of data per scenario
  - Isolation of primary/secondary raw data

-> FME based processing pipeline for raw TUFLOW outputs to Melbourne Water GIS products

Source: DEECA, FloodZoom

End to End Solution

TUFLOW FME Geodatabase Melbourne Water

- Move from previous scripted automations to low/no-code FME
- Process
  - Point FME at a directory of outputs
  - Processing creates initial flood extent
  - Water (Flood) Engineer assigns flood extent based upon flood source (Drainage or riverine)
  - Remaining process derives outputs (contours, buildings/parcels flooded, grid points, flood hazard areas)
- Deliverables all land in defined geodatabase, ready for transmittal

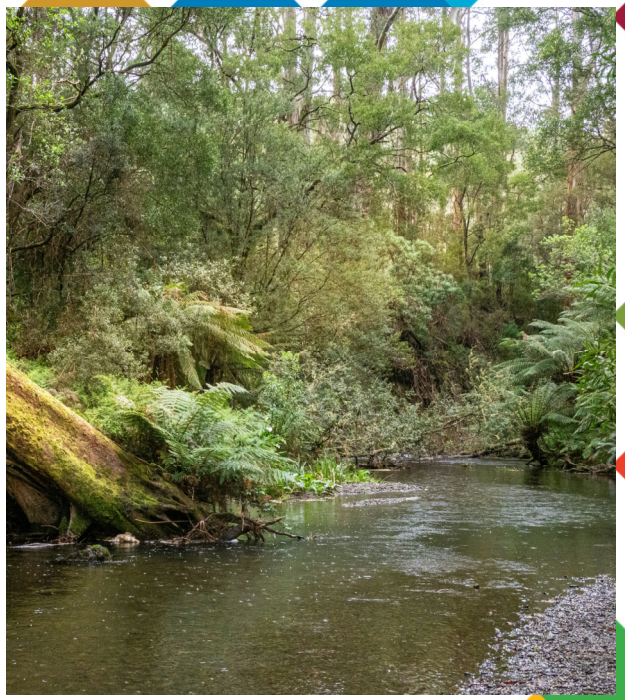
1spatial YOUR WORLD SMARTER

Lessons Learnt & Future opportunities

- Automation is great when the entire team is onboard- communicate, educate & support

Opportunities

- Post processing validation of outputs/deliverables received by Melbourne Water
- Provision of expanded toolkits by Melbourne Water to service providers



Barwon River Source: Bruce Wilson, Unsplash

The most relevant SDGs related to the presentation and theme of this session

1st relevant SDG

2nd relevant SDG

3rd relevant SDG

SUSTAINABLE DEVELOPMENT GOALS

International Federation of Surveyors supports the Sustainable Development Goals