



WORLD TOUR
2018

FloodFX

Economic Appraisal Using FME

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JACOBS®

OVERVIEW

1. **The challenge** – economic appraisal
2. **The solution** – FloodFX
3. **The approach** – FME Tools



A composite image featuring a view of Earth from space, showing the curvature of the planet, blue oceans, and white clouds. In the foreground, a futuristic city with tall, metallic buildings and advanced technology is visible, suggesting a blend of nature and advanced civilization.

THE CHALLENGE: Economic Appraisal

BENEFITS vs. COST

Why economic appraisal of stormwater infrastructure?

- CCC Land Drainage Recovery Programme
 - Earthquake land damage has increased flood risk
 - Group of flood events in 2014
 - Climate change and sea level rise
 - Establish common appraisal standard across Christchurch
- Benefits should outweigh mitigation costs
- Funds shall be used to maximise social welfare



BENEFITS vs. COST



BENEFITS vs. COST



BENEFITS vs. COST





THE SOLUTION: FloodFX

WHAT DOES FloodFX



Economic appraisal tool that calculates:

- Flood related damages

Direct Damage		Indirect Damage	
Tangible	Intangible	Tangible	Intangible
Property, land value, goods, infrastructure, utilities	Health and life, irreplaceable items, ecosystems	Accommodation, travel, clean up, emergency services, production and income loss	Inconvenience caused by disruption of services, utilities, infrastructure

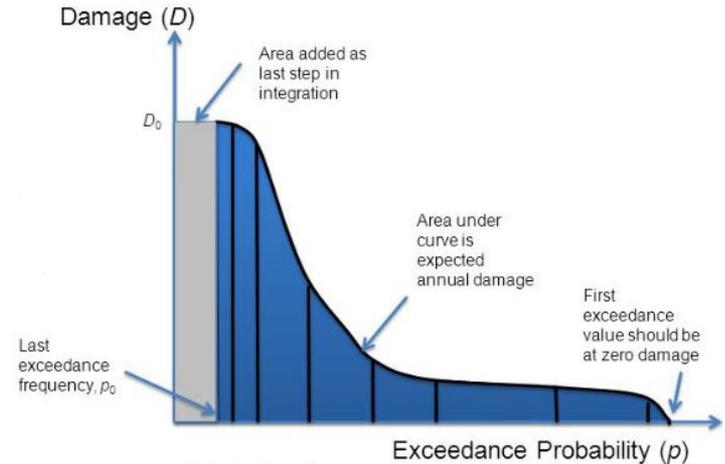
WHAT DOES FloodFX

Economic appraisal tool that calculates:

- Average Annual Damage
- Present Value (determines present value of future damage)
- Damages classified by residential / non-residential buildings
- **Benefits using intervention costs, cost benefit ratio**



Probability Damage Curve

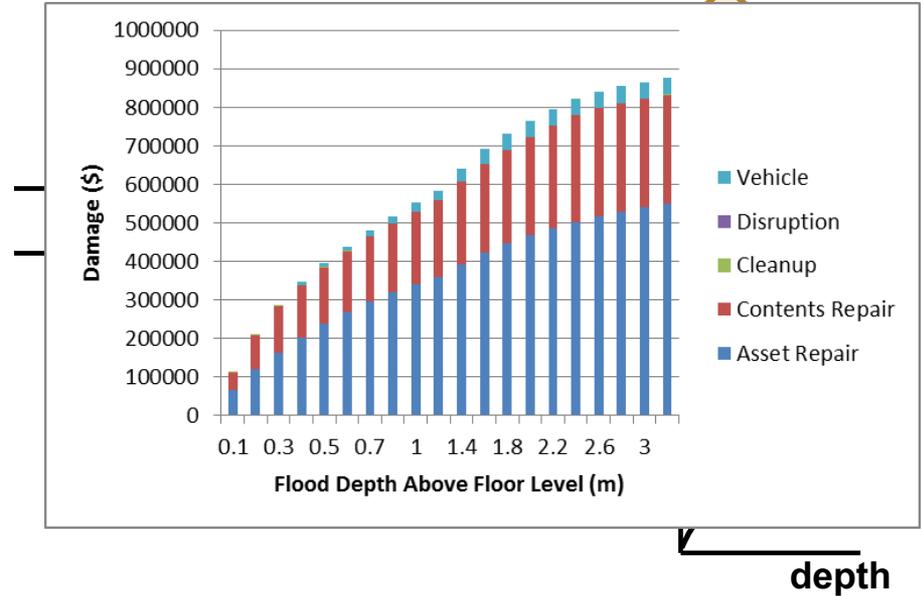


DC McKinney (<http://slideplayer.com/slide/4571457/>)



FloodFX BASE DATA

- Classified buildings dataset
- Building floor level data
- Property value data
- NIWA RiskScape flood depth-damage curves (property based)
- Hydraulic model outputs (polygon or raster data)
- AOI polygons





FLOODFX: DECISION MAKING



THE APPROACH: FME Tools



FloodFX FME TOOLS



**Upload Flood Model Data
(polygon data)**



**Upload Flood Model Data
(raster data)**

Upload and pre-process
model data to FME
Server storage



FloodFX

Economic appraisal.



Delete Dataset



Subset Dataset



Batch run FloodFX

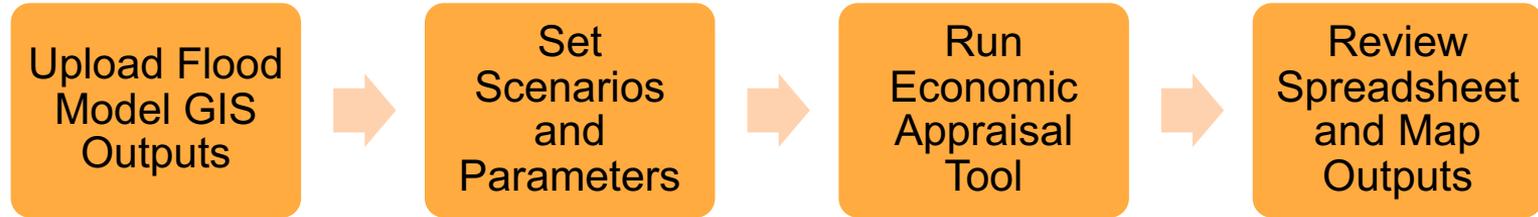


**Purge Datasets
and outputs**

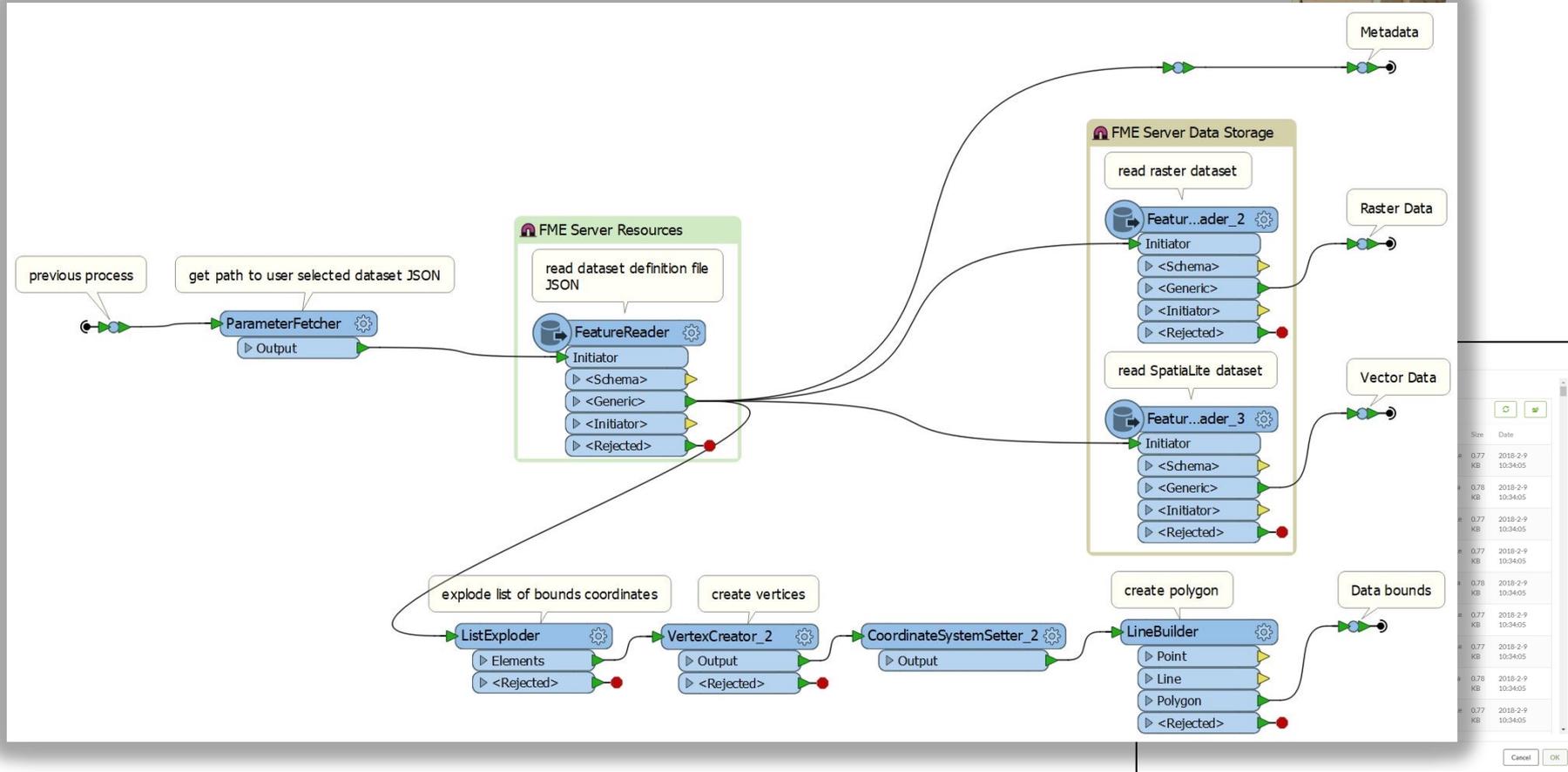
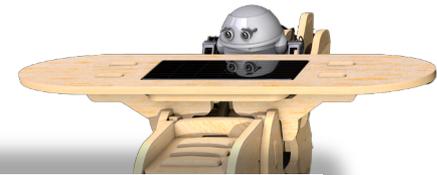


Download Dataset

FloodFX FME TOOLS



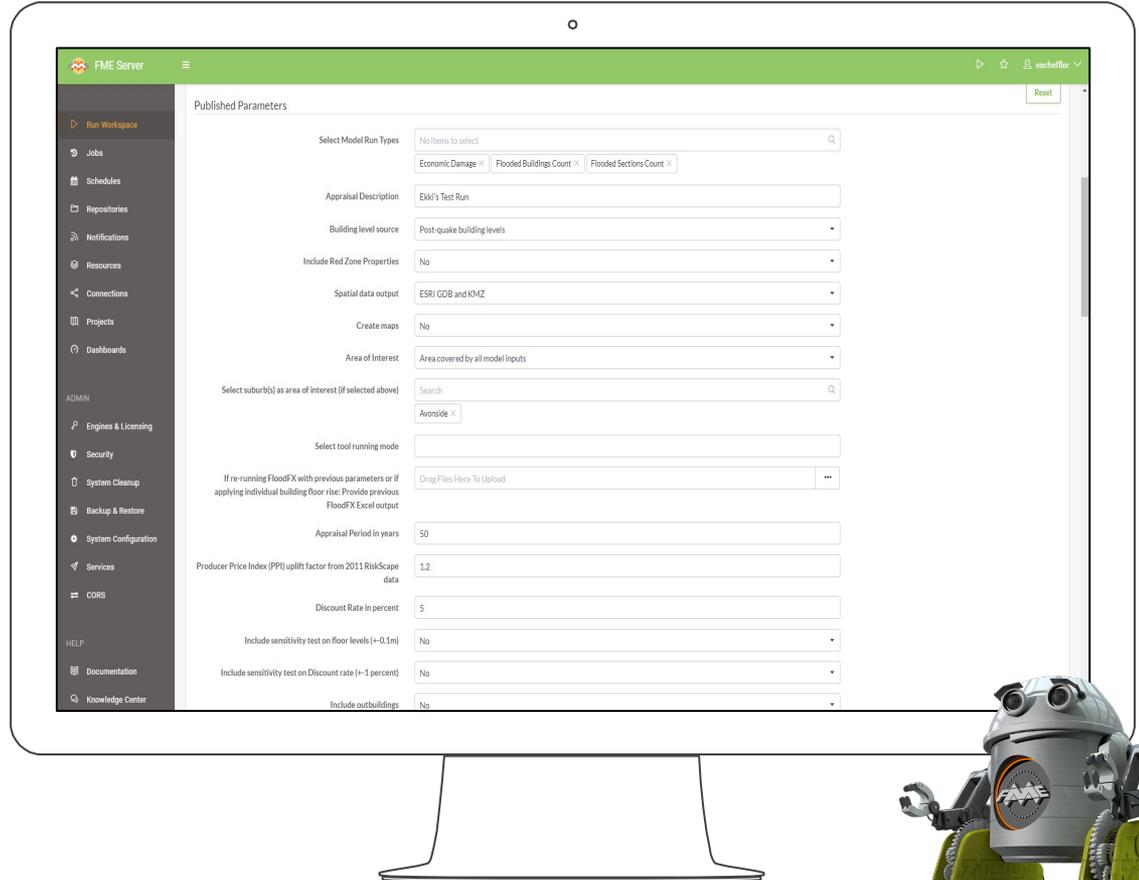
FloodFX DATASETS





FloodFX

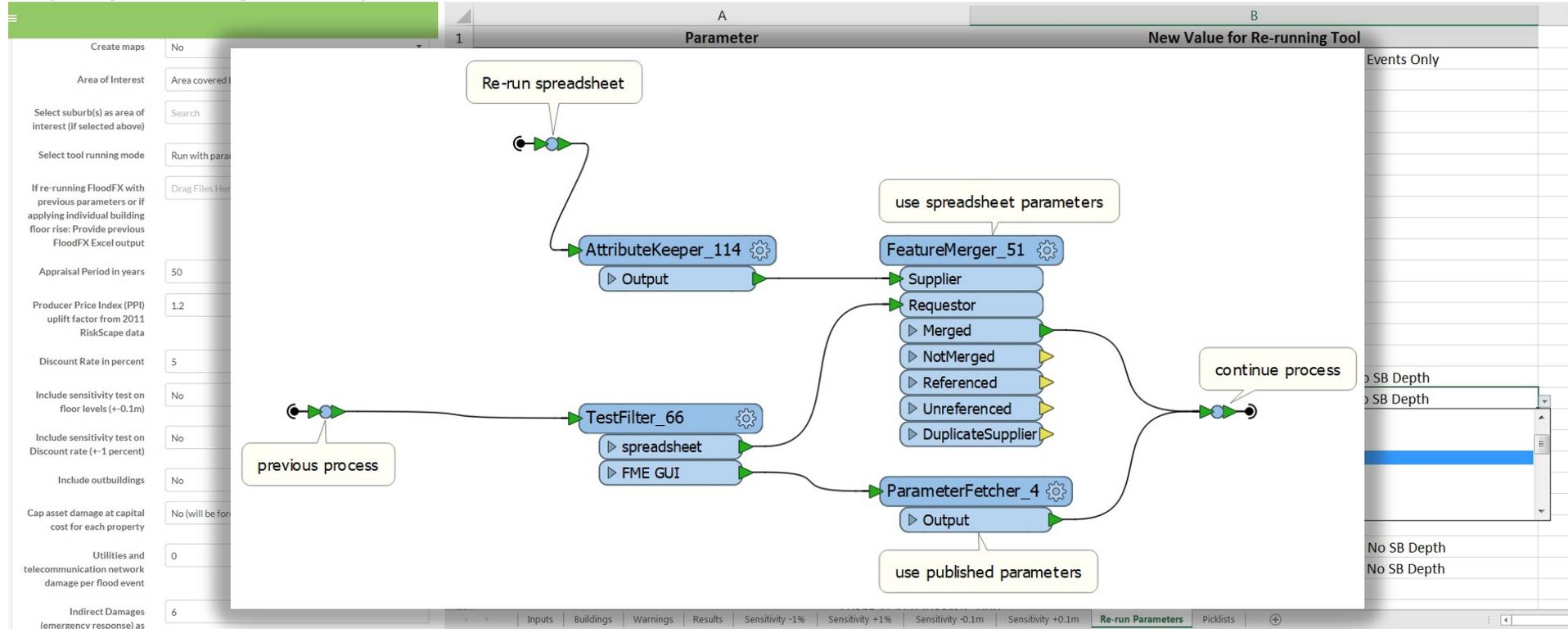
- Up to 6 probability events
- Base case and up to 2 interventions
- Sensitivity tests on floor levels and discount rate



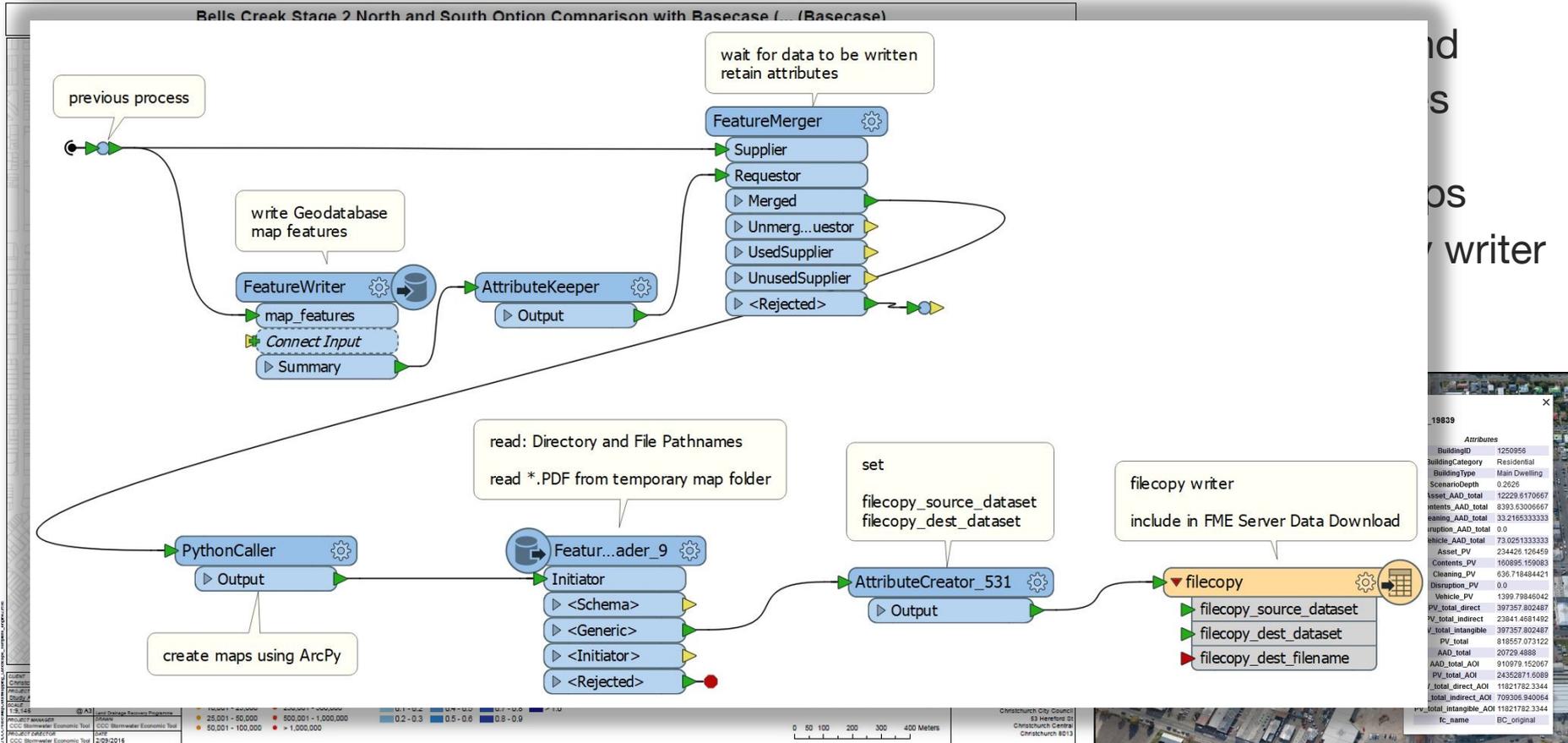
FloodFX REPEATS

62 published param.
(49 private param.)

Re-run tool by amending previous output

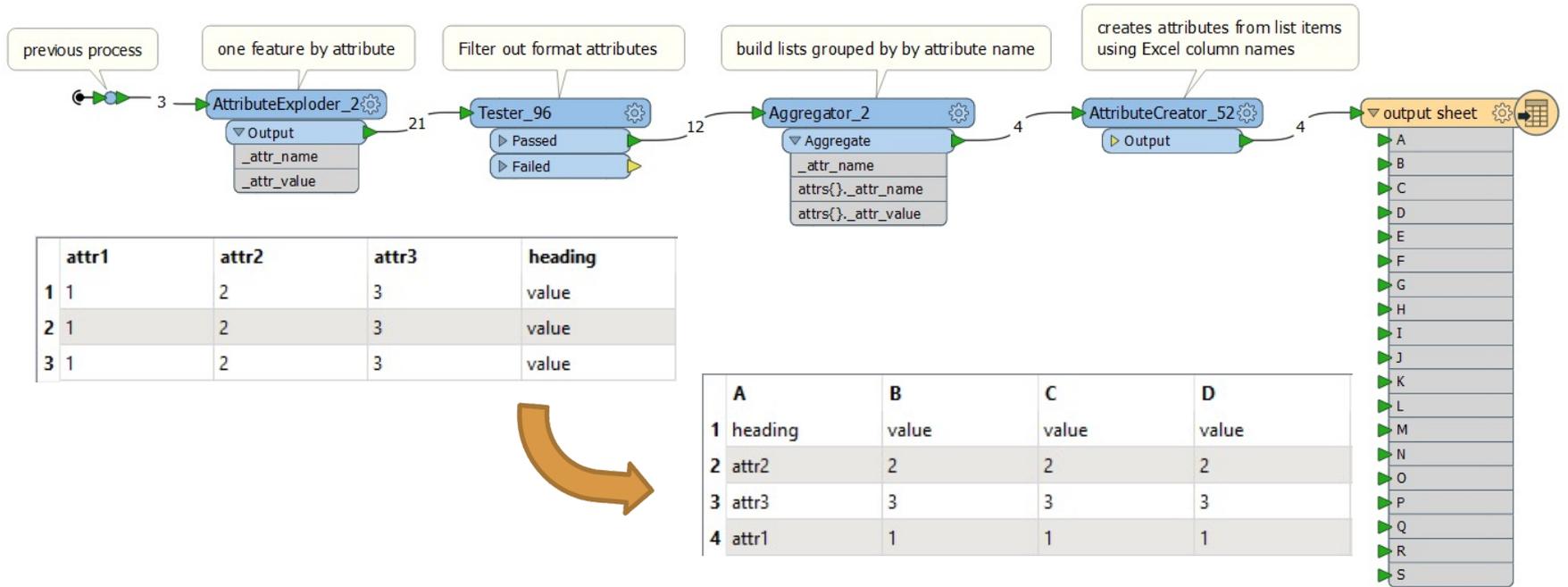


FloodFX OUTPUTS



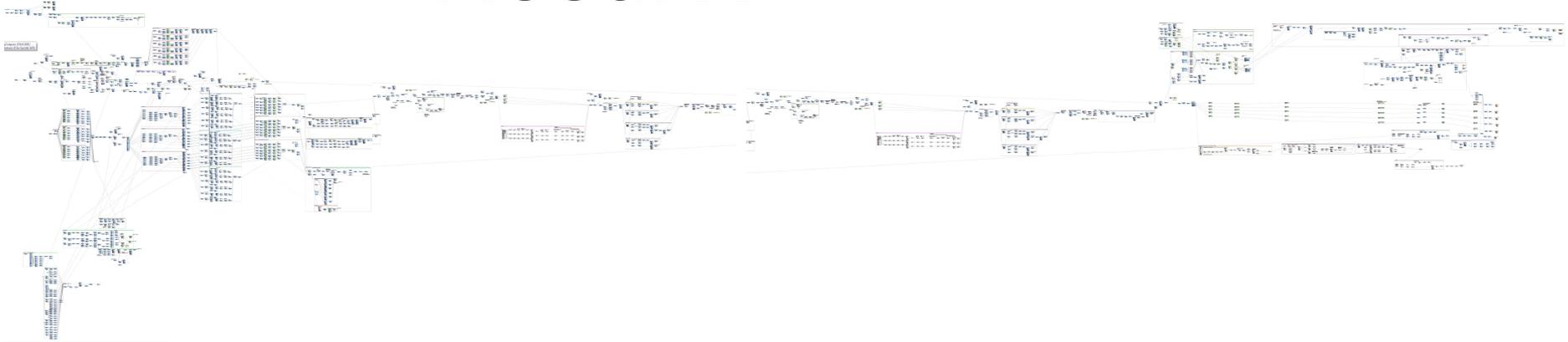
FloodFX OUTPUTS

	Basecase	Intervention (Single or Staged)	Intervention (Alternative)
PV Total Damage	\$15,178,006	\$11,670,881	\$6,701,934
PV Total Damage - Non-residential (excl. Network)	\$4,643,772	\$2,600,296	\$4,368,742
PV Total Damage - Residential (excl. Network)	\$10,534,234	\$9,070,585	\$2,333,192

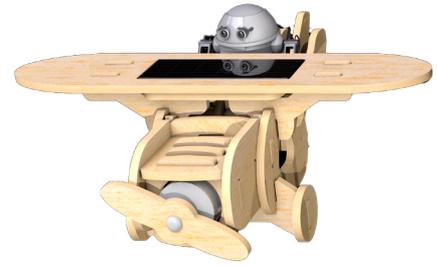


lates

FloodFX



IMPROVEMENTS



- FloodFX website
- User interface using FME Server API
- Improved dataset and user management



THANK YOU!

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