Asia Water Forum 2022
8–11 August 2022 • Online

Focus Area: Climate change and water-related risks

Flood Resilience in action - Lessons learned over 3 years of forecasting with FLASH

Schedule: 11 August 2022 (Thu), 9:00 a.m. - 10:30 a.m. (GMT+08)

Royal HaskoningDHV
Enhancing Society Together

ADB

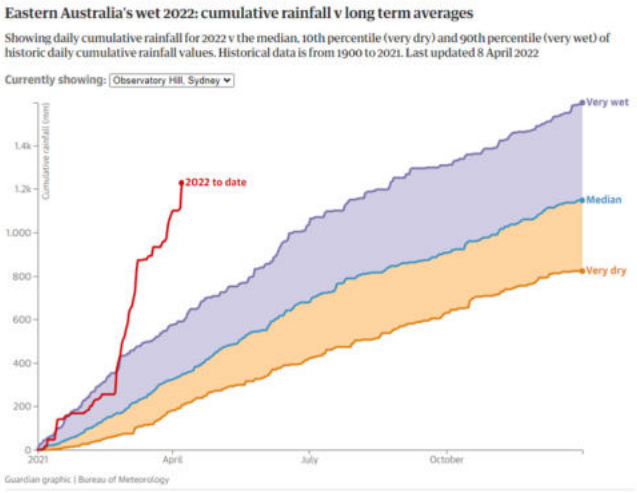
Content

- Flooding Australia 2022
- Introduction to FLASH
- Operational FLASH Systems in Australia
- Lessons Learned

Flooding 2022 Australia

Stubborn La Niña persists - World Meteorological Organization |

10 jun. 2022 — The current **La Niña** event started in September 2020 and continued through mid-May **2022** across the tropical Pacific. There was a temporary ...



Australia's devastating floods spur new warning systems

By Emily McAuliffe
Business reporter, Melbourne, Australia

5 July

Lismore was badly hit by flooding earlier this year

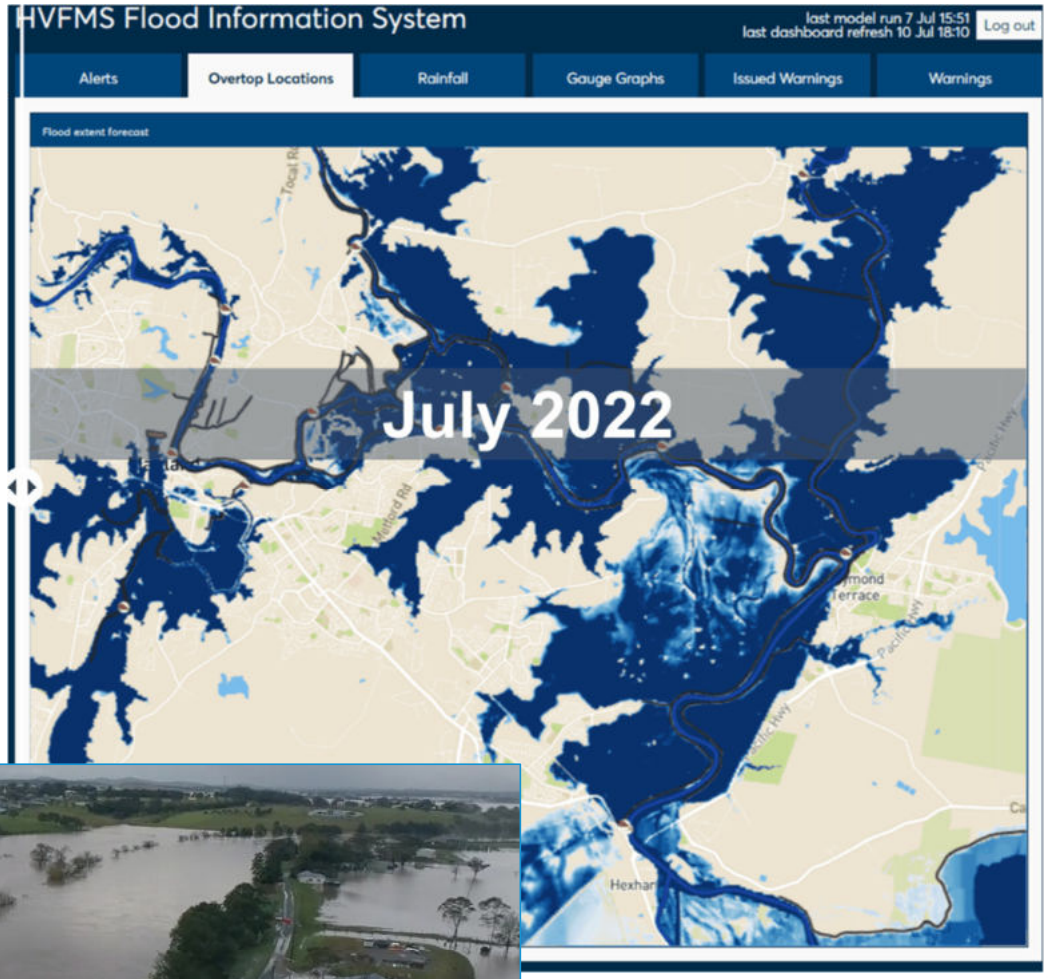
Flooding 2022
Australia,
Hunter Valley (HVFMS)

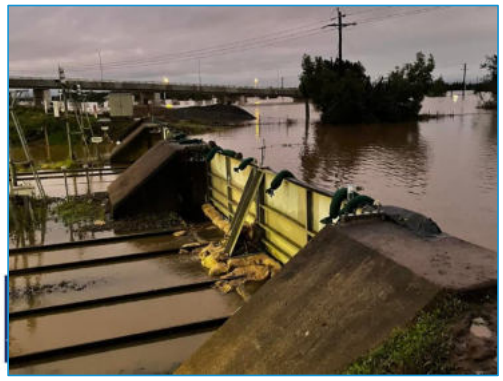
-150-300mm rainfall in 24 hours

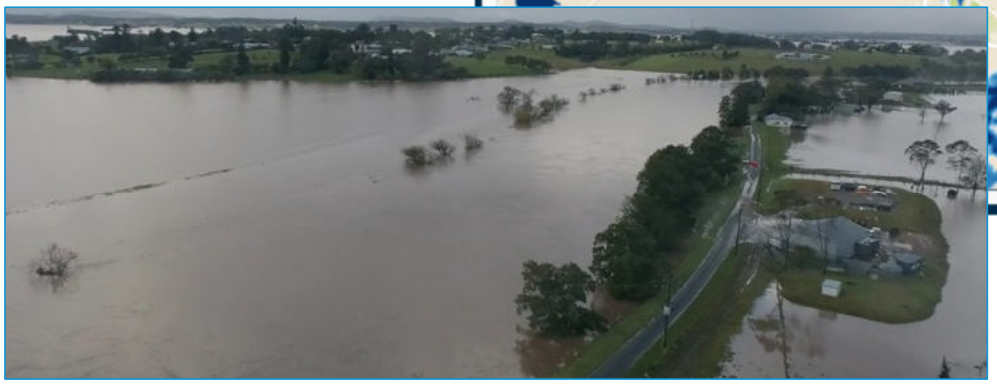
-Road closures, Highway inundated

-Risk of levee breach

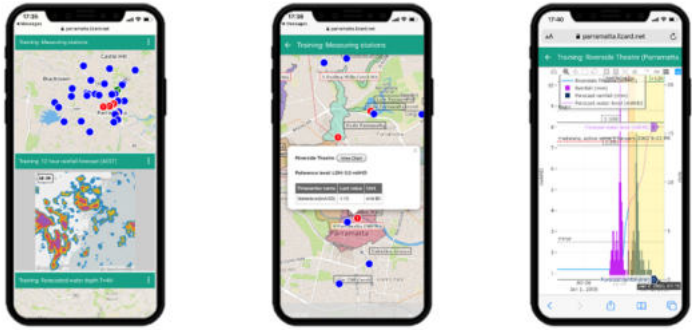
-Similar to a 10% AEP event



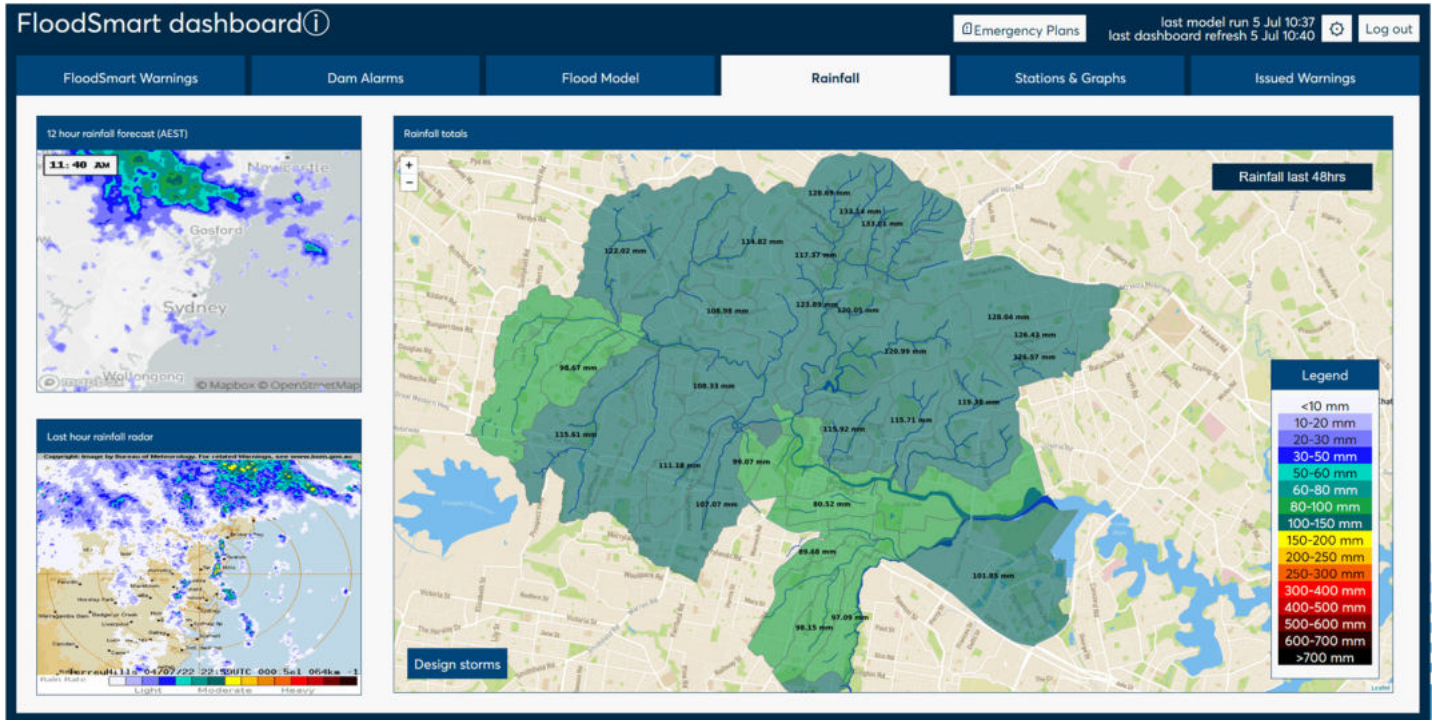




Introduction to FLASH: Key Points



- Cutting Edge, Simple to use Flash Forecasting globally available
- Increased lead time to allow preparation / protection of assets and lives and/or or evacuation
- Based on real time rainfall and predicted gridded rainfall
- Very fast calculation and data processing
- Custom flood warnings and alerting groups
- Web based and compatible on all devices
- User specific Dashboard
- A web-based 'Lizard' Portal for collecting, collation and displaying detailed rainfall and (historical) gauging data;
- Automated validation reports – Post-Event Analysis



Operational FLASH Systems in Australia

City of Parramatta (Sydney)

- Short lead time 2-3hrs
- Relatively small catchment (120km^2)
- Steep catchment with incised rivers
- Highly urbanized catchment

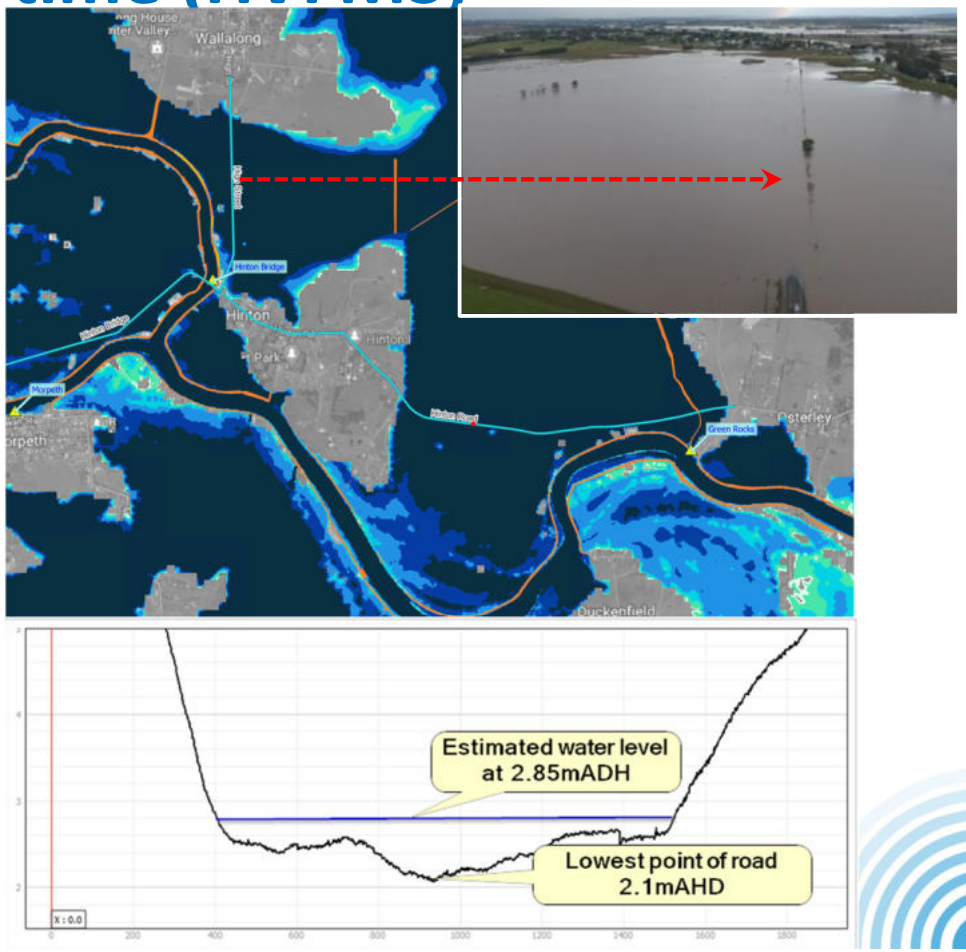
Hunter Valley Flood mitigation scheme (Newcastle – Australia)

- Lead time 2-4 days
- Large catchment (20,000km2)
- Large flood plains controlled by an extensive network of integrated levees, floodgates and drains.

Lessons Learned

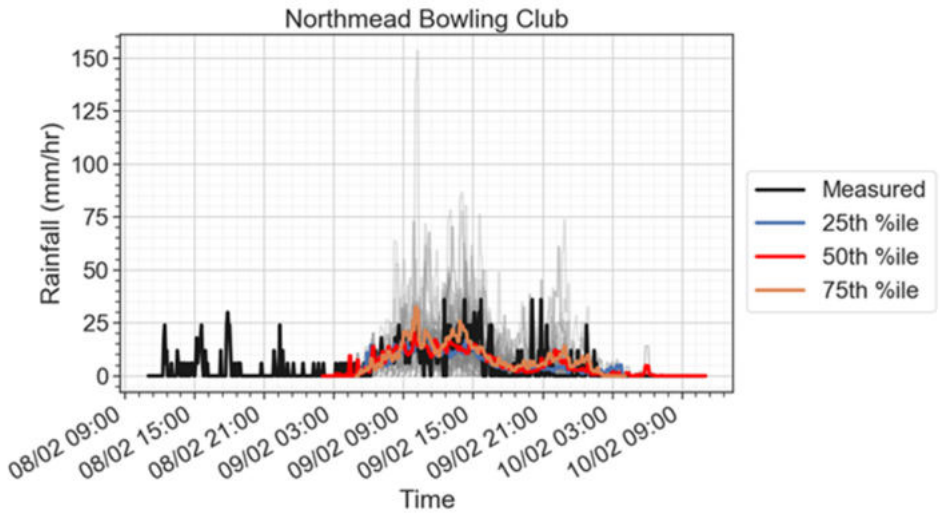
Lessons learned - Forecast systems for large catchments with days of lead time (HVFMS)

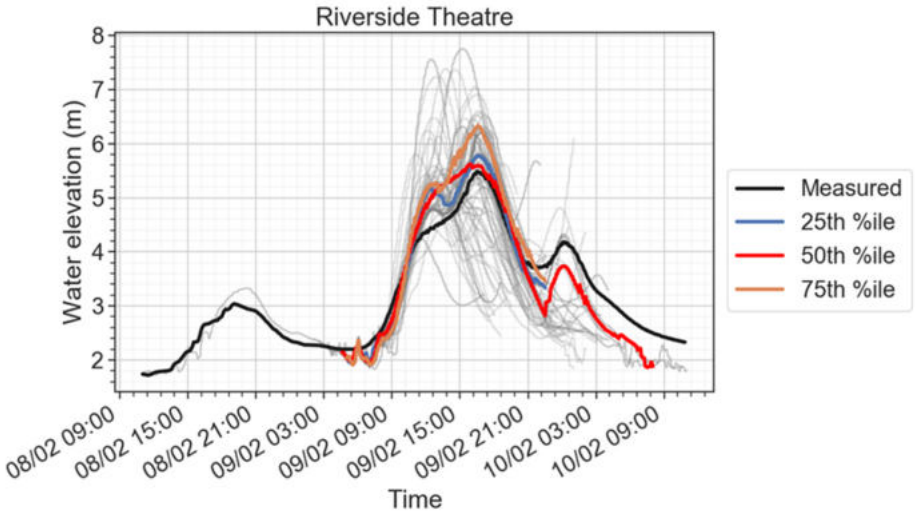
- Assisting emergency teams during flood events with **additional modelling** and interpretation of predictions has proven to add significant value to the forecast system.
- Not only the peak water levels but also the predicted **duration of flooding** / road closures has proven to be important to inform isolated communities on expected time of isolation.
- System not only to mobilize emergency service on time, but also to **downscale warning level** and demobilize on time so that capacity can be used elsewhere



Lessons learned - Forecast systems for steep catchments with limited lead time (parramatta)

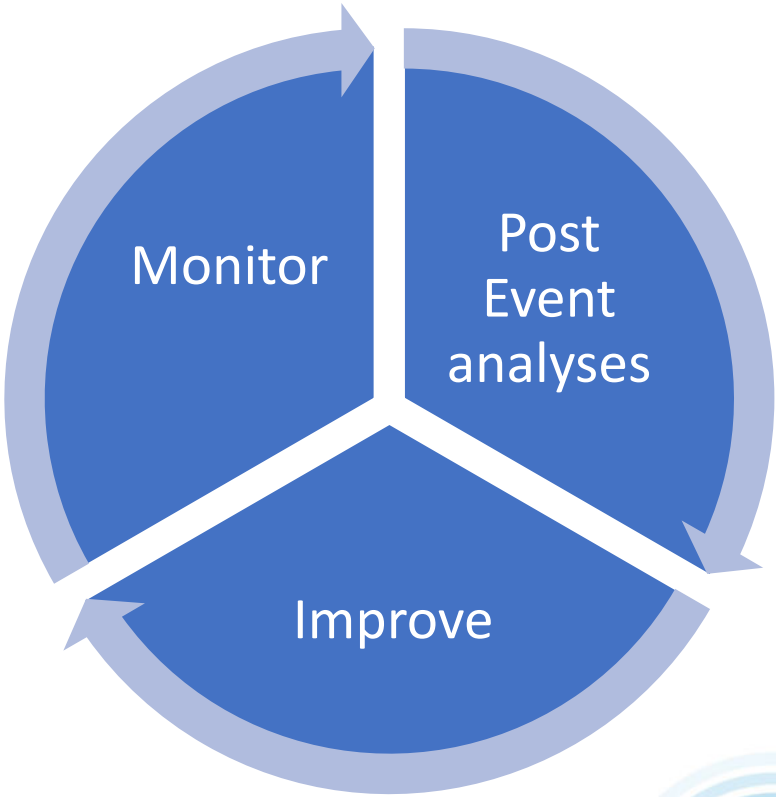
- "**Warm state" transference**, accurate warm states of the system are essential to predict the timing of an event.
- **Accuracy** of the provided **rainfall forecast**, difficult to predict exact location of rainfall
- Important to compare **multiple forecast** to reduce impact of variability of individual forecasts.
- System speed is essential to allow for **enough lead time** for emergency responders





Lessons learned - All Forecast systems

- Avoiding **false alerting** is critical to build trust in the system. Only sent out warnings if two sequential model runs breach a trigger.
- Finetuning of an operational system takes time, **post event analyses** is critical to improve the system and use the lessons learned.
- Funding a forecast systems is not a Lump sum invested but require an **ongoing maintenance budget** and dedicated staff.
- The ability to incorporate **existing models** into forecast systems helps to reduce the costs of system setup.
- Models can now be run on **consumer grade GPU's** using SGS and QPC mean that large catchment fully 2D dynamic simulations can now be undertaken fast enough for use in flood warning systems.
- The generation of **accurate flood extents/depths** is required to adequately inform emergency workers.



Discussion / Questions