



**WATER
DIRECTORATE**

The Four Horsemen - Drought, Fire, Flood, Pandemic

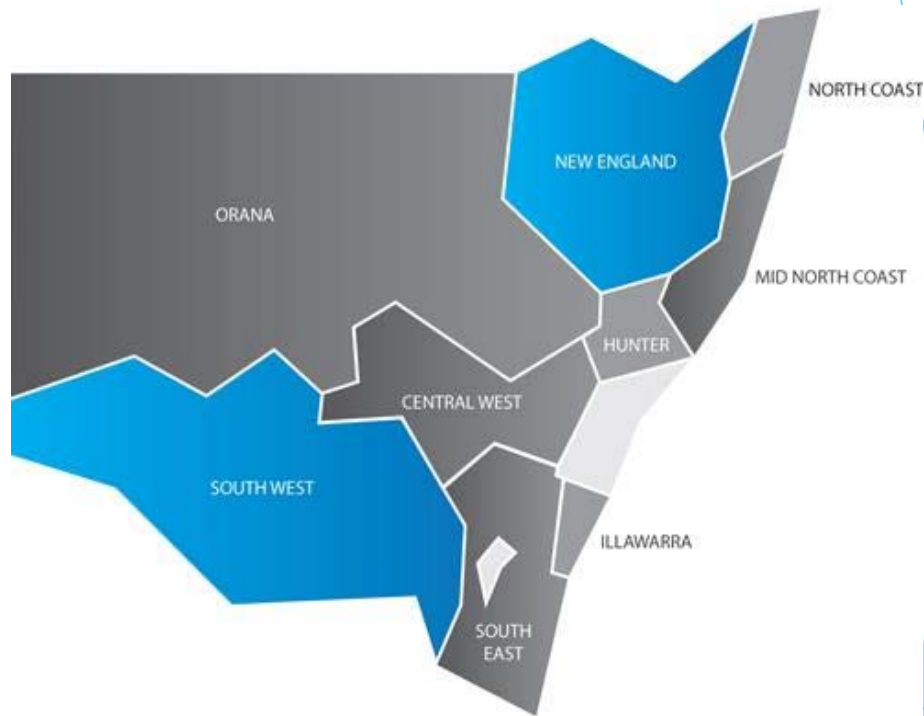
What can we learn?

How can we build resilience in regional NSW water utilities?

Brendan Guiney | Executive Officer
WSAA Regional Forum - 24 June 2020

About NSW Water Directorate

- ▶ We advocate for and provide technical support to 89 NSW local government owned water utilities in non-metropolitan NSW
- ▶ Our member councils:
 - ▶ Serve 1.85 million people in regional NSW communities
 - ▶ Own and operate 350 water supply schemes and 300 sewerage schemes
 - ▶ \$28 billion in asset value
 - ▶ Supply 312 GL/annum water
 - ▶ Treat 160 GL/annum of sewage





Drought

Fire

Flood

Pandemic

Drought...







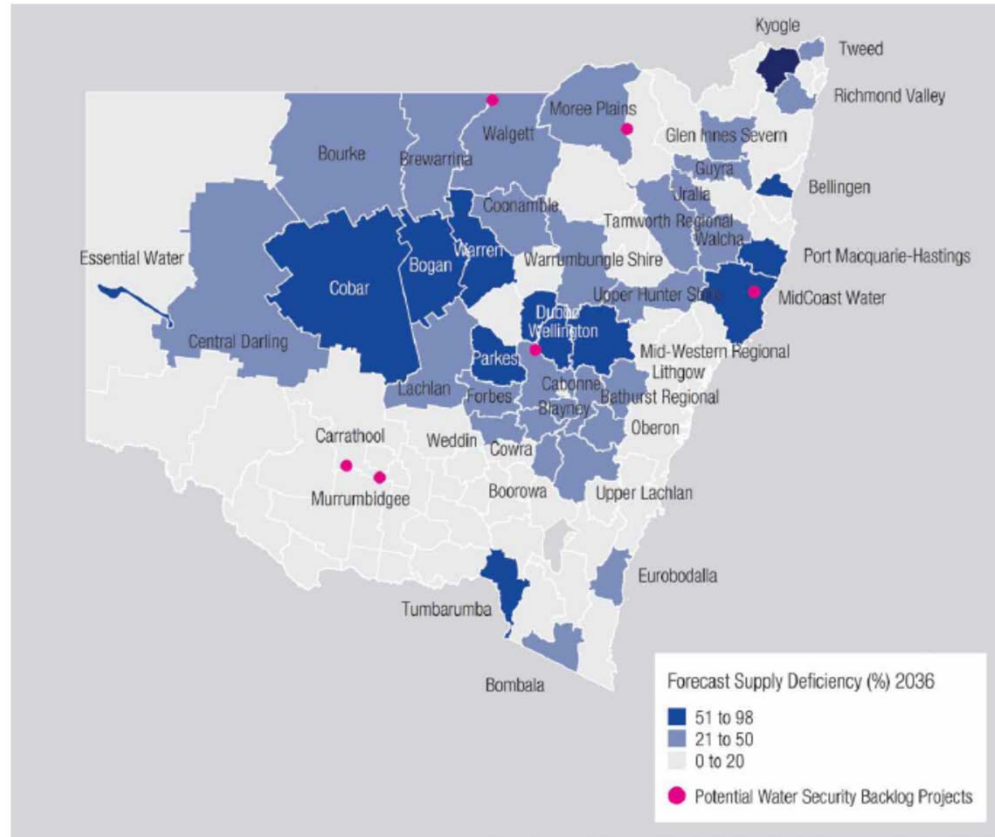


Drought

- ▶ Bureau of Meteorology reports the worst drought in Northern NSW in 120 years of instrumental record
- ▶ In January 2020, more than 50 water supplies at 'high risk' of failure, with many small town supplies failing much earlier. Larger regional centres at risk include Dubbo, Bathurst, Orange, Tamworth, Armidale and Taree. The economic costs of failure of larger centres are too large to contemplate.
- ▶ Water conservation effort in town water supply areas are impacted by an increase in demand from rural properties not connected to the town supply needing water for stock and domestic purposes.
- ▶ 'Day zero' communication scares communities. Towns encourage 'water wise' tourism in the face of water scarcity to sustain regional economies. Nevertheless, there is a downturn in economic activity.
- ▶ Environmental flows move turbidity and salts from dry riverbeds into weirs, compromising drinking water quality for smaller western towns.
- ▶ Low dam storages also introduce other water quality challenges, such as arsenic at Uralla.

Drought preparedness - 2014

Figure 6.4 Forecast water supply deficiency for local water utilities in 2036



Source: Infrastructure NSW

Fire...

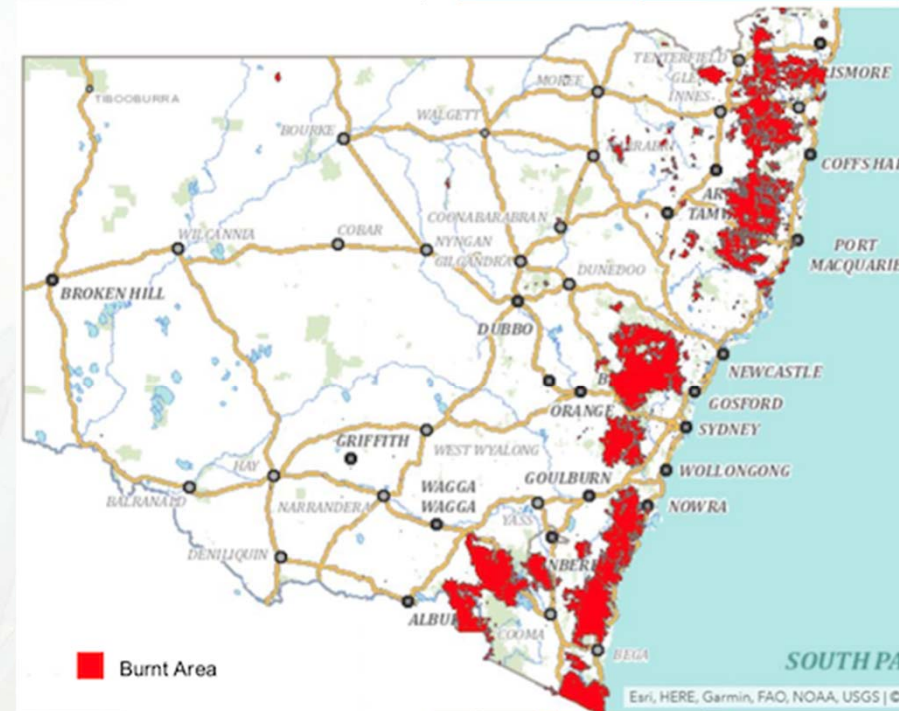






Fire

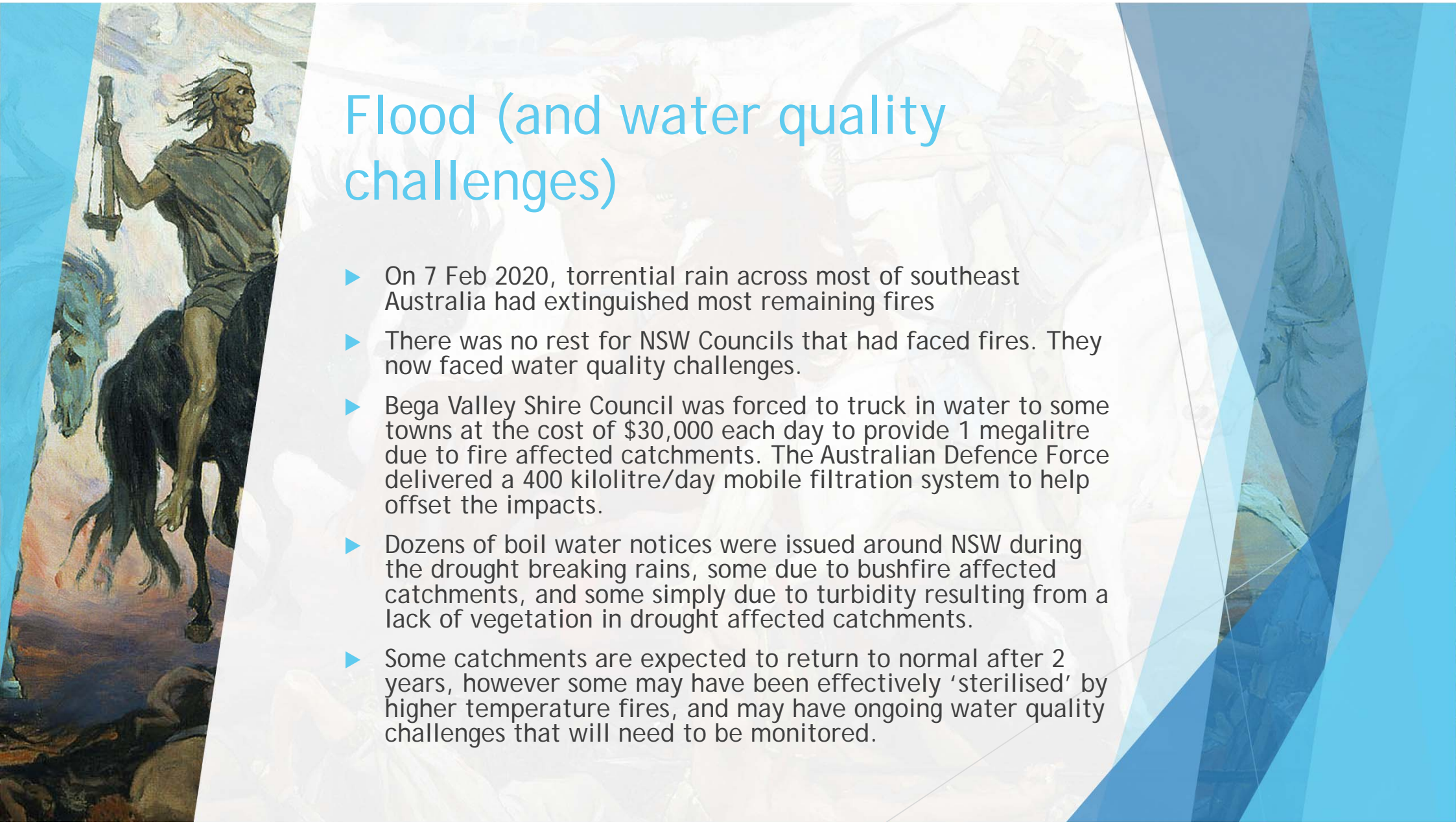
- ▶ NSW experiences the worst bushfire season on record over a period between September 2019 and February 2020.
- ▶ 5.4 million hectares of land area burnt, 25 fatalities, 2,439 homes lost.
- ▶ The Australian fires in 2019-20 dwarf the 2018 California wildfires and 2019 Amazon rainforest wildfires.
- ▶ In south coast NSW particularly, Bega Valley Shire Council calls on assistance from the Australian Defence Force, Eurobodalla Shire Council and Sydney Water for help to continue its water supply. We are grateful for the assistance.



Flood...







Flood (and water quality challenges)

- ▶ On 7 Feb 2020, torrential rain across most of southeast Australia had extinguished most remaining fires
- ▶ There was no rest for NSW Councils that had faced fires. They now faced water quality challenges.
- ▶ Bega Valley Shire Council was forced to truck in water to some towns at the cost of \$30,000 each day to provide 1 megalitre due to fire affected catchments. The Australian Defence Force delivered a 400 kilolitre/day mobile filtration system to help offset the impacts.
- ▶ Dozens of boil water notices were issued around NSW during the drought breaking rains, some due to bushfire affected catchments, and some simply due to turbidity resulting from a lack of vegetation in drought affected catchments.
- ▶ Some catchments are expected to return to normal after 2 years, however some may have been effectively 'sterilised' by higher temperature fires, and may have ongoing water quality challenges that will need to be monitored.

Pandemic...



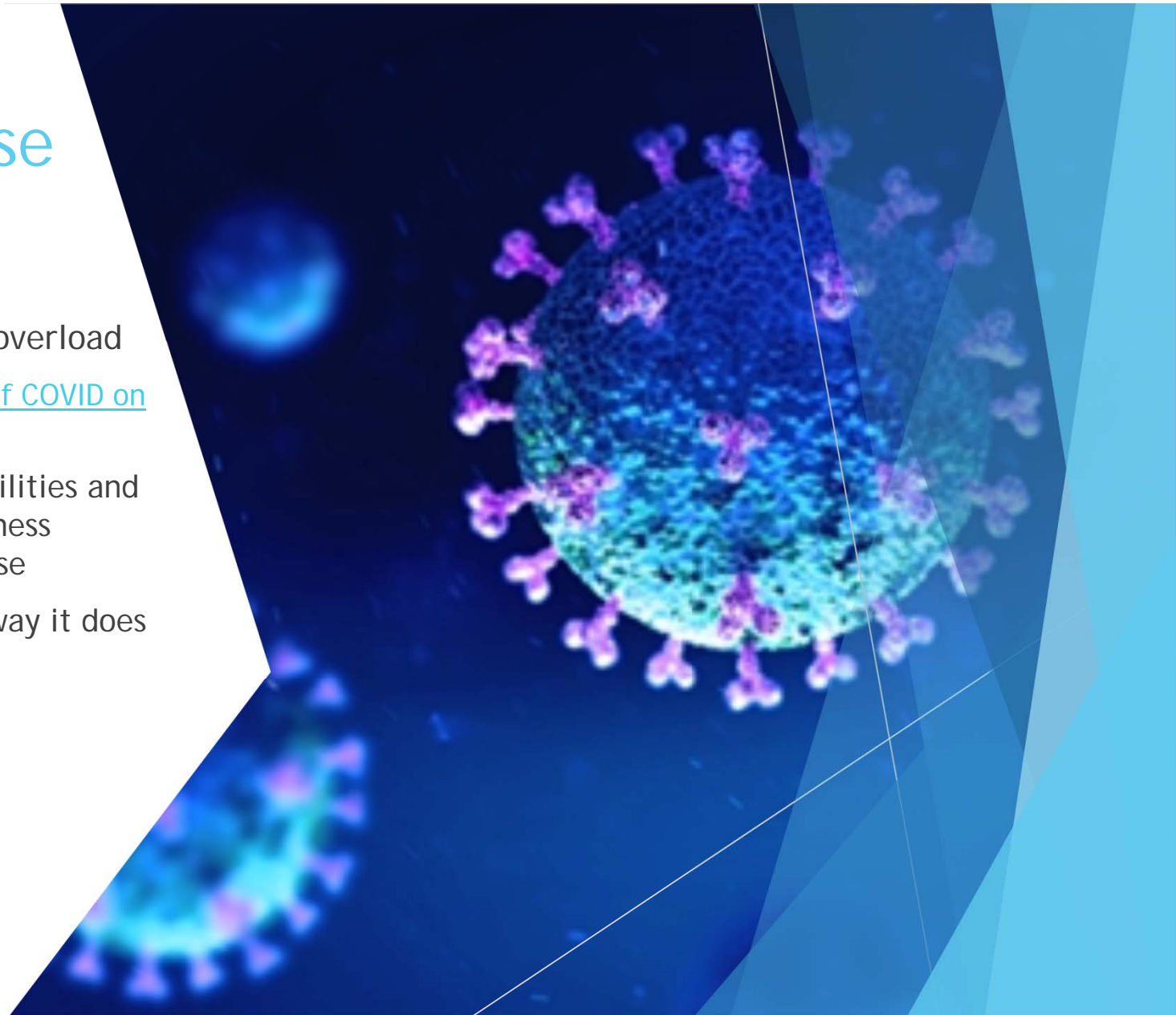


Pandemic - COVID-19

- ▶ From March 2020 onward, NSW local water utilities were faced with the need to respond to COVID-19 regardless of the previous impacts of drought, fire and flood. Business continuity had a renewed focus.
- ▶ Many Council owned water utilities used their regional relationships to update their business continuity in the face of COVID-19. This included regional water alliances such as Central NSW JO and Orana Water Utility Alliance as well as county councils including Riverina Water and Goldenfields Water.
- ▶ Many business continuity issues such as chemical supply and other supplies are common to all utilities in Australia. We are grateful to the metropolitan utilities and WSAA for assisting us.

COVID-19 response

- ▶ Distilled information to avoid overload
 - ▶ [Blog - Managing the impacts of COVID on local water utilities](#)
- ▶ Worked with WSAA, AWA, Isle Utilities and regional water alliances on business continuity and pandemic response
- ▶ Water Directorate changes the way it does business - 'virtual approach'

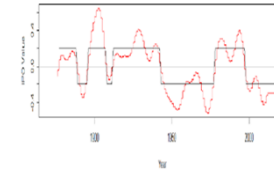


How can we build resilience?

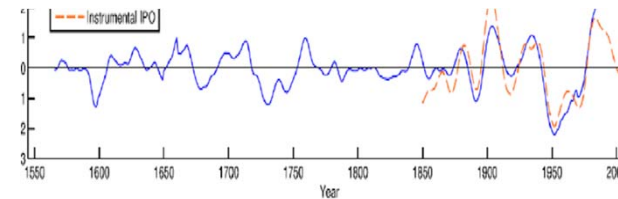


Climate modelling

Observational (130 years)



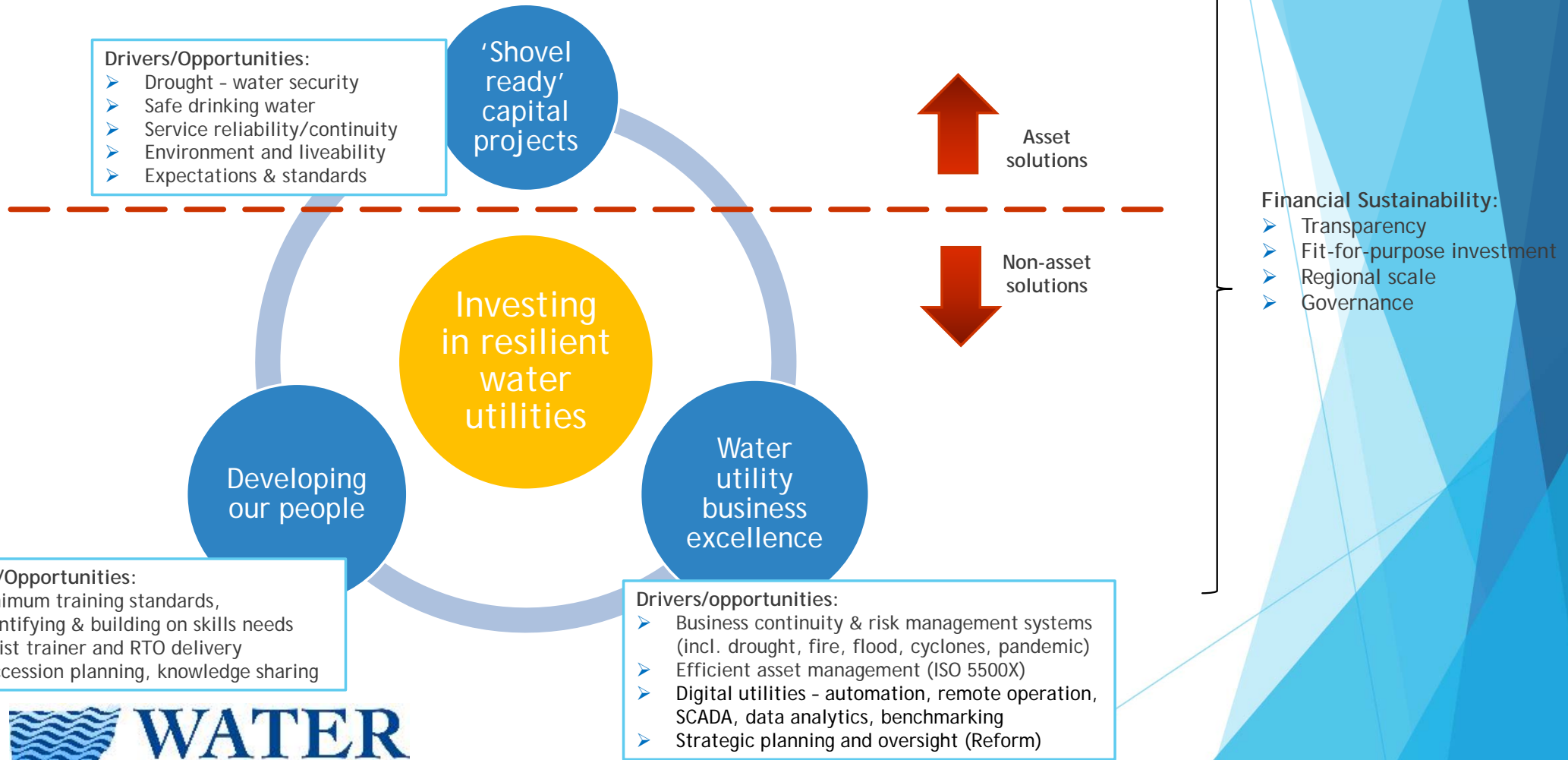
Palaeo (up to 2000 years)



Stochastically generated (sample from 10,000 years)



Rapid and smart investment...



- Drivers/Opportunities:**
- Drought - water security
 - Safe drinking water
 - Service reliability/continuity
 - Environment and liveability
 - Expectations & standards

- Drivers/Opportunities:**
- Minimum training standards, identifying & building on skills needs
 - Assist trainer and RTO delivery
 - Succession planning, knowledge sharing

- Drivers/opportunities:**
- Business continuity & risk management systems (incl. drought, fire, flood, cyclones, pandemic)
 - Efficient asset management (ISO 5500X)
 - Digital utilities - automation, remote operation, SCADA, data analytics, benchmarking
 - Strategic planning and oversight (Reform)



Digital utilities... technology innovation program

Innovative

Virtual working

- Virtual reality and augmented reality tools
- Digital twins (virtual models)
- Virtual operator training

Remote working

- Mobile devices for field workers
- Remote system access to SCADA, GIS, Asset Mgt, Work orders
- Smart meters and customer apps

Remote technical support

- Operational tech and information tech convergence
- Callout tech
- Trending and analytics support

Emerging

Intelligent data management

- Collection and analysis of existing data sources
- Trending, predictive analytics

Remote sensing tech

- Drones - flying/crawling/floating
- Aerial data capture
- Satellite data services
- Thermal imaging and laser scanning

Mature

Risk/opportunities

- Cybersecurity - risk of disruption
- Enable customer access to information

SCADA improvement program

- Upgrade existing plant control systems
- Adopt digital radio telemetry
- Remote operation and automation

Improved data capture

- Online water quality and pressure monitoring - plants and reservoirs
- Leak detection tech

Principles to Guide Investment

- Regional scale planning for consistency in drivers and greatest opportunity to support longer term strategy.
- Prioritise economic recovery by focussing on:
 - water security;
 - safe drinking water;
 - environmental stewardship;
 - business continuity and reliability (capability/sustainability/governance and reform)
- Clear levels of service and financial transparency to underpin long-term investment.
- Recognise water and sewerage services as an economic growth enabler.
- Address fundamental infrastructure backlogs and their economic implications.

Benefits...

- Water is a critical enabler for regional economic development.
- Investment in water has a strong economic multiplier effect.
- Water is an essential service and underpins community and ecological health.
- Resilient water services are required to withstand future challenges of drought, bushfire, floods and pandemic.
- The flow-on socio-economic benefits to regional towns to other regional sectors is unquestioned.
- Reduced risk of future water security, water quality or public health incidents.

Thank you

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