

New climate analysis informs NSW's regional water strategies

A new approach to understanding past and future climate risk is informing NSW's 12 regional water strategies for a more water-secure future.

Twelve regional strategies aim to protect NSW's water security

The NSW Government is developing 12 regional water strategies that aim to make sure there is the right amount of water, of the right quality, delivered in the right way to meet the needs of our communities, Aboriginal people, industry and the environment.

The strategies are a roadmap for the next 20–40 years. In them, we look at how much water a region will need to meet future demand. They reflect the challenges and choices involved in meeting those demands. We look at the actions we need to take to manage risks to how much water is available from our surface water and groundwater systems.

Four-step approach to better understanding past and future climate risk

The development of the strategies has been informed by a new, four-step approach to past and future climate risk. This approach recognises the absolute importance of climate risk to our future water supplies.

Step 1: Building on 130 years of recorded climate data

In the first step, we analyse our past 130 years of recorded climate data and the climate drivers that influence past and present climate. This gives us an understanding of the variability of our climatic system, but we recognise that 130 years is not enough to understand the likelihood of extreme events, especially long-term droughts.

Step 2: Adding 500 years of paleoclimatic climate data

The next step adds 500 years of climate history to our knowledge by analysing things such as tree rings, river sediments and ice cores that have spent a long time in our landscape and carry tell-tale marks of significant climatic events and changes in climate. Through this process, we can detect past patterns of wet and dry that go back 500 to 1,000 years.

Step 3: Looking at the past to understand 10,000 years of climate data

In the third step, researchers apply stochastic modelling to our 500-year picture of past climate to look at possible climate sequences with 10,000 years of data. This type of modelling tells us much more about possible climatic extremes. We now have a much better understanding of the probability of long-term droughts and significant floods.

Step 4: Using climate-change projections to improve our understanding of future risks

The fourth step incorporates climate-change projections from global and regional climate models into our water modelling. This is because we recognise that climate change will alter historical patterns of climate and change our climate risks.

Global climate models are useful for providing broad predictions of likely variations and changes in rainfall, rather than providing specific regional details. Global climate models are more accurate at predicting future temperatures, which drive evaporation rates, as there is less variability in evaporation rates compared to rainfall. We use regional climate models to provide more detailed estimates of rain across regional NSW.

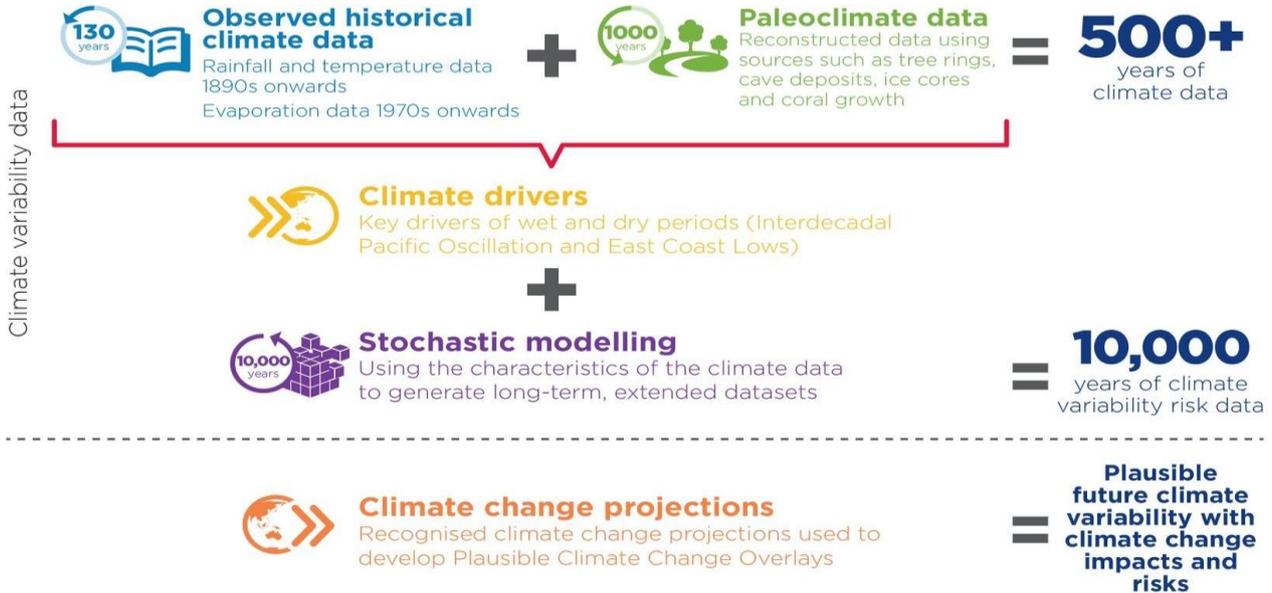


Figure 1. The new climate-risk modelling approach combines historical data with our knowledge of climate drivers and climate-change forecasts

NSW’s water supplies less secure in the future than we thought

Our modelling shows that for southern inland NSW, winter and spring rains are likely to decrease. Along the south coast, changes in the patterns of east coast lows are likely, with an increase in the intensity of rainfall, but the potential for fewer events. There is a lower likelihood of significant changes in average annual rainfall in the north of the state. For evaporation rates, all models predict increases across the state leading to drier conditions.

This new approach has shown us that NSW’s surface water supplies are likely to be less secure than we thought. More work is required to apply the new climate data to our understanding of groundwater systems to determine how secure groundwater supplies will be in the future.

Expert panel says new method significantly advances our understanding of climate risk

An expert panel evaluated the new climate-risk assessment method. They found that the method is ‘fit for purpose’ in providing the best available knowledge of climate risk to inform NSW’s regional water strategies. They found that the method was consistent with best practice in the field and a major advance over using only historical records or only climate models.

The expert panel noted that this is an area where the science is still developing. They recommended ongoing work to continuously improve the method and keep up to date with the latest scientific findings. The NSW Government is considering all their recommendations.

More information

Visit www.dpie.nsw.gov.au/climate-data-and-modelling

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