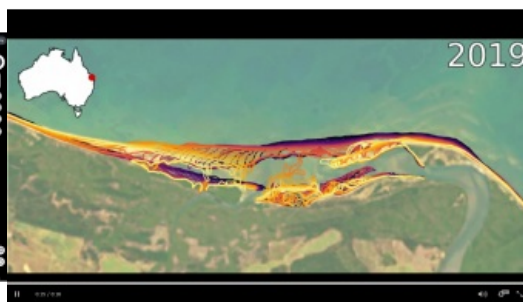
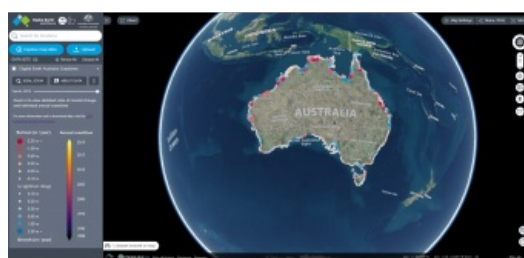


Satellite Imagery Reveals Three Decades of Coastal Change



The evolution of Australia's coastlines can now be seen in unprecedented scale and detail, using a new tool developed by Geoscience Australia's Digital Earth Australia (DEA) programme. Using satellite imagery collected since 1988, "DEA Coastlines" maps annual changes to Australia's coastlines to highlight long-term trends in coastal erosion and growth. The free [online](#)

[tool](#) also illustrates "how natural coastal features such as sandbanks or river mouths shift and change over time."

Geoscience Australia's National Earth and Marine Observations Branch Head Maree Wilson said DEA Coastlines provides scientists, managers and policymakers with new information to maintain and protect Australia's iconic shores for future generations.

Tracking Changing Shorelines

"Australia has a highly dynamic coastline of over 30,000 kilometres with many unique environments: sandy beaches, rocky cliffs, muddy tidal flats and mangroves. DEA

Coastlines is the first nationally consistent dataset within Australia that tracks these changing shorelines," Ms Wilson said.

"Understanding how "our coastal environments" have "been historically affected by pressures such as extreme weather, sea-level rise" and human development is "vital to managing our coastlines now and into the future."

[DEA Coastlines](#) uses world-leading techniques to combine satellite data with tidal modelling to map the location of the coastline at mean sea level each year, "showing changes along the coastline at an unprecedented scale."



[DEA Coastlines animation of Barubbra Island, Queensland.](#)

The rise and fall of the tide along Australia's coast dramatically affect the position of the shoreline, making it difficult to separate long-term coastal change from the short-term effect of tide. This is particularly the case in locations like north-west Australia's Kimberley region, where tides can rise by up to 11 metres, potentially shifting the position of the shoreline by tens or hundreds of metres.

By accounting for tide, the DEA Coastlines method produces coastlines and rates of coastal change that can be compared consistently across time, and between different coastal locations and environments along Australia's coastline.

Subpixel Mapping Method

DEA Coastlines also applies an advanced subpixel mapping method that uses subtle differences in the 'wetness' of each satellite pixel to draw out high-resolution coastlines from lower-resolution satellite imagery. This means that the tool is accurate down to 10 metres – and able to detect coastal change as small as 2.9 metres in certain coastal locations. Previous global mapping was limited to 30-metre resolution. DEA Coastlines also draws on nearly 58,000 independent measurements of coastline positions across Australia to ensure the accuracy of its mapping.

"[Geoscience Australia](#) worked extensively with local councils, state governments, academia and citizen scientists to ensure the tool will help them reliably assess impacts to our precious coastlines and "plan for the future," Ms Wilson said.



The interactive DEA Maps platform. (Courtesy: Geoscience Australia)