



FEBRUARY 2023 ESTIMATES OPENING STATEMENT

DR LARRY MARSHALL – CSIRO

Thank you, Chair and Committee, for the opportunity to update you briefly on the recent activities of your national science agency, CSIRO.

Over the summer, we continued to see extreme weather impact communities through the combined impacts of a La Nina cycle and climate change.

These increasingly severe and widespread events underpin the importance of reports like our 2022 **State of the Climate report**, which CSIRO released with the Bureau of Meteorology in November.

While the world has failed to decrease emissions, and we will continue to feel the impacts throughout this century, science gives us hopes for adaptation to the impacts of climate change.

This is at the heart of CSIRO's \$90 million **Towards Net Zero** mission, which was launched in October with partners including the Queensland Government and the Climate Change Authority.

The mission is working with key stakeholders in agriculture, transport and resources to reduce emissions in some of our hardest-to-abate industries. And just as Australia gave the world the winning solar cell design, Australian innovation can also address 15% of the world's greenhouse gas emissions through FutureFeed – a seaweed-derived feed additive to reduce emissions from livestock.

Turning to the health, this month scientists from CSIRO and Queensland University of Technology used artificial intelligence to develop a world-first benchmark for measuring brain atrophy – or thinning - in neurodegenerative diseases.

This includes Alzheimer's disease, the most common form of dementia, accounting for 60 to 80 per cent of cases. A great example of collaborative intelligence, combining the best of human and machine brains.

Assessing the onset and progression of Alzheimer's using brain magnetic resonance imaging – or MRI - has traditionally been challenging as changes in the thickness of the brain's cortex are extremely small, often in the sub-millimetre range.

Using the power of machine learning, the scientists were able to produce a set of artificial MRI images of brains with predefined signs of neurodegeneration in the cortex region, the outer layer of the brain most affected by Alzheimer's.

Before these findings, there was no way to conclusively determine the sensitivity of the various methods used to measure cortical thickness in Alzheimer's patients.

While AI might seem like the latest and greatest in the science world, science still has plenty to give to one of Australia's most successful and oldest innovations – drought-resistant cotton.

This week we completed a \$25 million upgrade to our CSIRO facilities at the Australian Cotton Research Institute at Myall Vale near Narrabri in northwest NSW, in partnership with Cotton Seed Distributors.

CSIRO's cotton breeding work began 50 years ago and 100 per cent of cotton now grown in Australia is a product of CSIRO science and is world-class. These new facilities are another example of our long-term commitment to creating new industries in rural Australia.

Trying to create a drought-resistant cotton seed in what's considered a dry country probably felt like reaching for the stars all those years ago. But stargazing is also something we happen to love.

It's especially good in Western Australia, where the level of light and noise interference is incredibly low.

In November, we were honoured to receive a new name for our observatory in Western Australia from the Traditional Owners of the land where the observatory resides.

Inyarrimanha Ilgari Bundara, the CSIRO Murchison Radio-astronomy Observatory, already hosts several telescopes and will be home to the international SKA-Low telescope. In December, the international SKA Organisation announced the start of SKA-Low construction on the site.

CSIRO also continues to play a key role in solving Australia's innovation dilemma.

CSIRO's ON Program is a world-leading innovation catalyst, inspiring Australia's scientists to turn their science into real world solutions for our greatest challenges.

In December, we announced support for the next cohort of 10 deep-tech game changers from Australia's universities and research community, all selected to develop their high-potential science through the ON Accelerate program.

None of this would be possible without our extraordinary people, our most important asset.

Over the past few years, CSIRO people have doubled the value they deliver to Australia, which is measured through an annual independent audit, and has grown from \$5 billion in 2014 to \$10.2 billion in 2022.

I thank every member of Team CSIRO for their hard work and commitment, and am happy to take your questions.

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