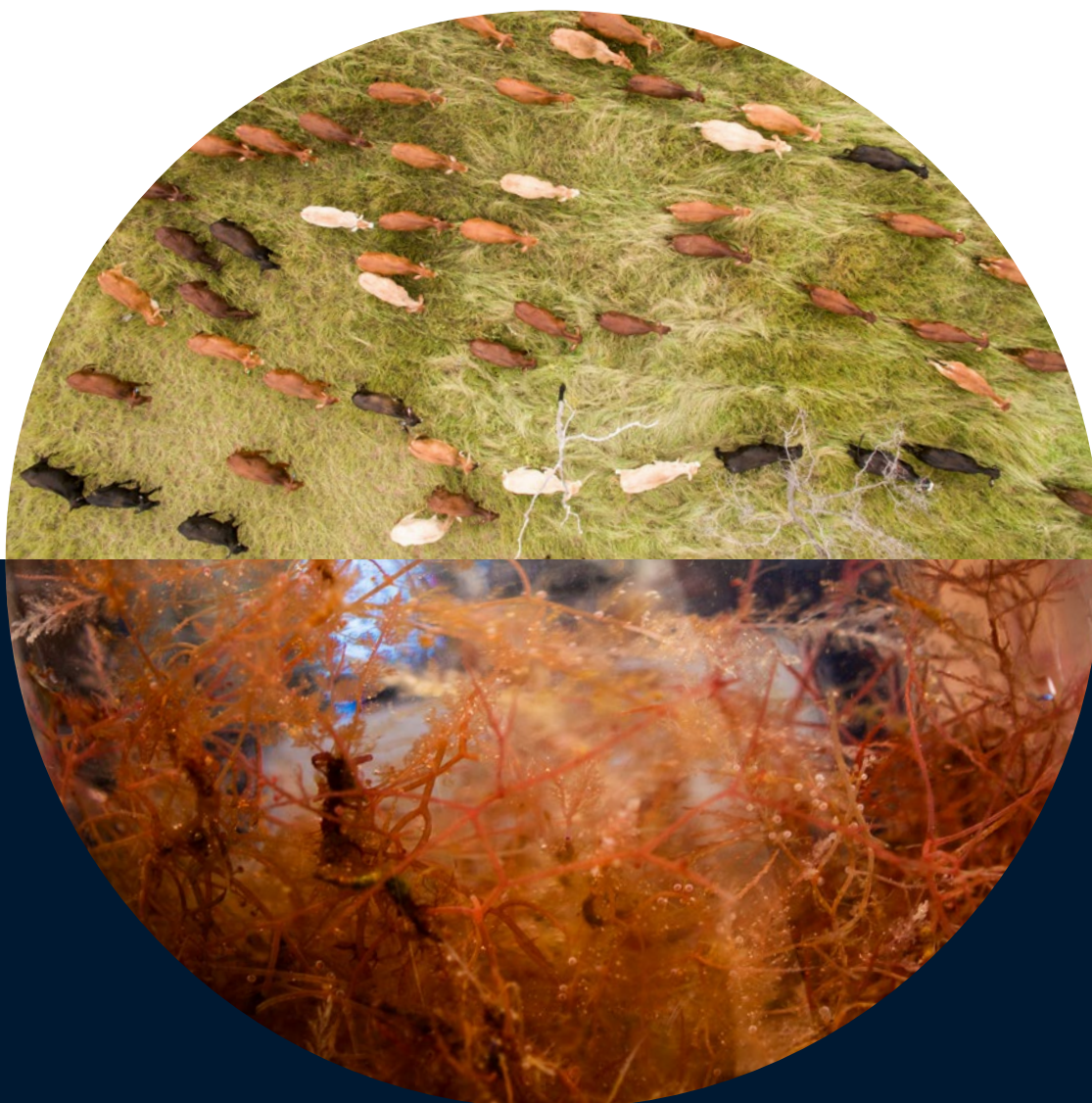




Australia's National
Science Agency



Highlights 2021

An aerial photograph of a wide, dry riverbed. The riverbed is composed of light brown sand and silt, with several small, winding channels of water. The banks are lined with dense green trees and shrubs. The background shows a vast, flat landscape under a clear blue sky.

As Australia's national science agency and innovation catalyst, CSIRO is solving the greatest challenges through innovative science and technology.

Our Drought Resilience mission is focussed on driving on-farm innovation, building regional resilience and acting as a policy enabler to support drought preparedness.

From our Chief Executive

CSIRO exists to make life better for all Australians. We work with research and industry to turn science into real-world solutions, we deliver impartial science to support government policy, and we invest in Australia's future.

2021 saw us deliver strongly on these fronts in an environment that tested us all. But through the strength of our people, network and partnerships across research, industry and government, together we delivered the solutions from science that allowed us to reach beyond what anyone could achieve alone.

This snapshot provides a brief overview of the contribution from your national science agency over 2021 and celebrates how our people and partners worked together for the nation during a tough year.

Whether it be building drought resilience for regional communities, innovating in new fuels to transform our energy and industries, or investing in the great Australian science and technology that will provide our wealth and jobs of the future, CSIRO has been there with the impartial science to guide the way.

We have also supported Australia's COVID-19 response, and in our role of national preparedness, we continue to plan Australia's response to future pandemics, extreme weather, and biosecurity threats.

The problems we must solve – from digital transformation and energy transition to our health, food, and security – are much bigger than any one organisation. We are only solving them by working together, and CSIRO stands ready with the full force of the national science agency to help you achieve our mutual vision of making life better for all Australians.



Our 2020-21 Annual Report at [csiro.au/annualreport2021](https://www.csiro.au/annualreport2021) contains many more examples of our impact.

In 2022 and beyond, CSIRO will continue to be your partner in science, delivering evidence-based and trusted research to benefit our society, environment, and economy.

A handwritten signature in black ink, reading "Larry Marshall". The signature is fluid and cursive, with a large loop at the beginning.

Dr Larry Marshall
Chief Executive, CSIRO

Solving the greatest challenges through innovative science and technology



Food security and quality

In September, CSIRO launched three missions that will grow Australia's agriculture and food sectors to \$20 billion by 2030, with a \$150 million investment from CSIRO, government and industry. The Drought Resilience mission aims to reduce the impacts of drought by 30 per cent; the Trusted Agrifood Exports mission aims to increase the value of Australian agrifood exports by \$10 billion; and the Future Protein mission aims to produce an additional \$10 billion of high-quality protein products by 2030.

Image: Our Trusted Agrifoods Exports mission aims to boost the export earnings of Australian food through tools and technologies that verify our quality, safety and 'clean and green' credentials.



Clean energy and resources

In May 2021, CSIRO announced its \$68 million Hydrogen Industry mission with partners in industry and government. This mission aims to help drive down the cost of hydrogen production to under \$2 per kilogram, which will make the fuel more affordable and help position Australian as a world leader in hydrogen exports by 2030. Over the next five years, partners involved in the mission will deliver more than 100 projects to develop Australia's future hydrogen industry, expected to grow to 8,000 jobs and \$11 billion a year in GDP.

Image: Metal membrane for hydrogen separation.



Health and wellbeing

As Australia entered its second year of COVID-19, CSIRO continued to support Australia's national response. CSIRO worked with partners to understand the impacts of international travel reopening, studied the efficacy of 'warm' vaccines to expand the range of options available and fast-tracked development of new treatments. This work built on CSIRO's rapid response in 2020 to help Australian manufacturers pivot to make and test PPE. CSIRO also tested and developed vaccine candidates at its biosecurity facility in Geelong, the Australian Centre for Disease Preparedness, studied the survivability of the virus and modelling to project its spread under different scenarios.

Image: Droplets of SARS-CoV-2 in artificial mucous were applied to test surfaces. This work was done within the highly secure Biosecurity Level 4 laboratories at our ACDP.



Resilient and valuable environments

In 2021 CSIRO continued to strengthen the nation's resilience to extreme weather events, including bushfires. CSIRO developed new modelling to predict fire-spreading behaviour and increased citizen science resources across the country, enabling information to be harnessed on the ground and earlier. CSIRO worked on guidance for home protection, innovation to build resilience in critical telecommunications infrastructure, researched biodiversity recovery, and further developed the understanding of connections between climate change and bushfires.

Image: The collaborative One House project was the first research of its kind to test housing resilience to multiple extreme events.



Future industries

CSIRO collaborates across the innovation ecosystem to translate world-class research into economic growth. The CSIRO Innovation Fund, managed by Main Sequence, completed a \$250 million raise for its second fund, bringing the funds under management to over \$500 million. Main Sequence had invested in 39 deep-tech companies by the end of 2021, including three commercialising CSIRO research: Quasar Satellite Technologies, Eden Brew, an animal-free milk company formed with Norco, and Endua, a hydrogen battery technology company developed with Ampol. CSIRO also opened new facilities for industry and research partnerships, including a lunar testbed in Brisbane and a drill core lab in Perth.

Image: The latest evolution of our phased array technology will help Quasar's ground station service to communicate with hundreds of satellites simultaneously.



A secure Australia and region

As COVID-19 has shown, an increasingly connected world facilitates the spread of biosecurity threats. CSIRO remains at the forefront of Australia's preparation and response, in 2021 launching a seminal invasive species report, providing the latest scientific testing and advice for tackling mice infestations, and continuing to apply cutting-edge research to managing mosquito populations.

Image: Mouse researchers Steve Henry and Nikki Van de Weyer processing a captured mouse in the field. Credit: Sharyn Watt.

At a glance

CSIRO is one of the **world's largest** multidisciplinary science and technology organisations

We deliver around **\$7.6 billion** of benefit to the nation each year

We manage **state-of-the-art** national research infrastructure

5,300+ dedicated people work across our 58 sites globally

In 2021...

We worked with **492** international customers and collaborators from more than **70 countries**

We engaged more than **3,900 partners** in industry and government

We launched **4 missions** – large-scale scientific and collaborative research initiatives

We supported **16 Future Science Platforms** to advance research that will underpin innovation

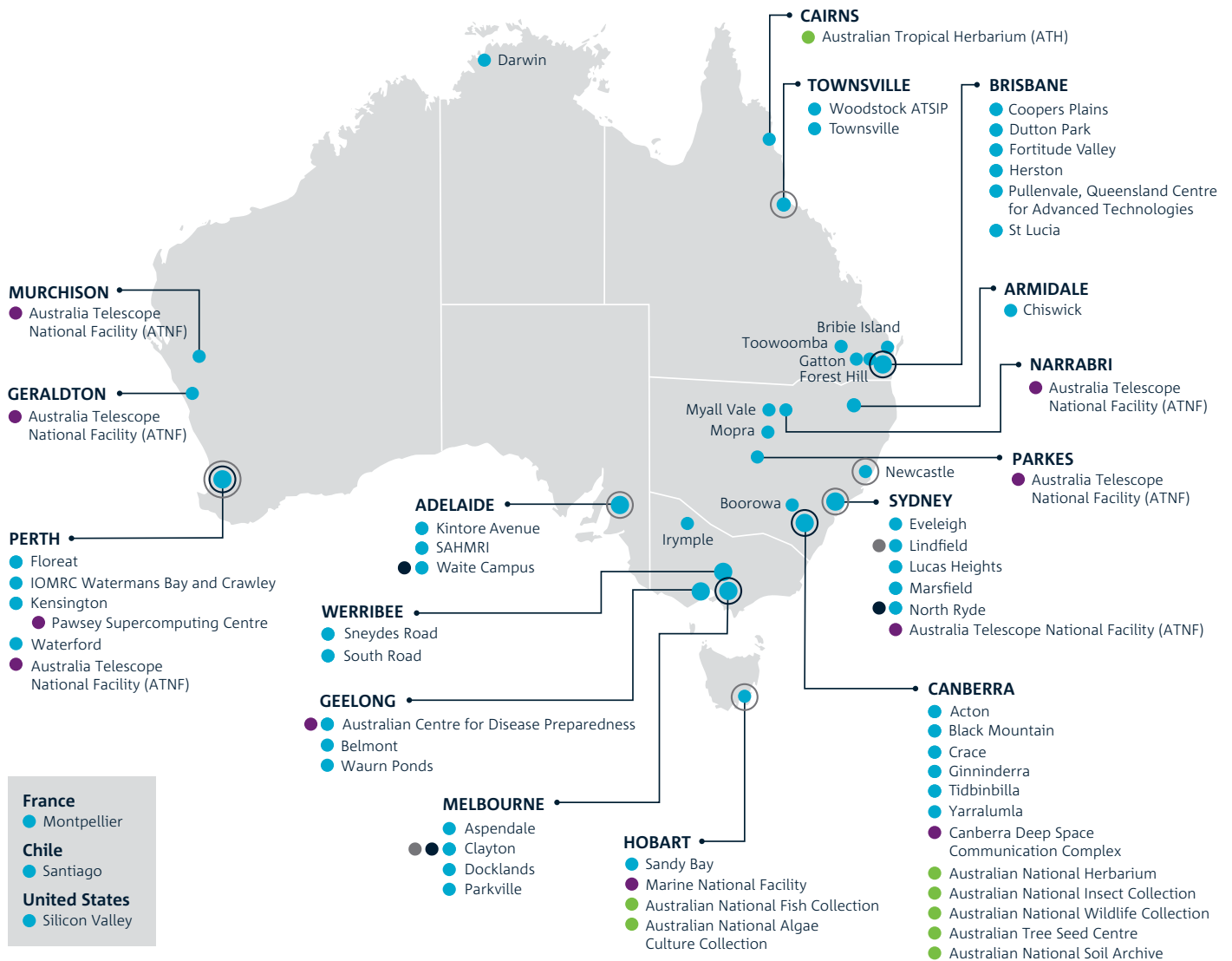
160,000+ students took part in our STEM education programs

We supported a national **Indigenous Science Program**

We injected more than **\$35 million** into the research and development of SME projects

\$265 million was raised by a second CSIRO Innovation Fund to commercialise our science

Where we work



- CSIRO site
- Global precinct
- National centre
- Collaboration Hub
- Testing Services
- National facility
- National collection

CSIRO staff work at **sites** throughout Australia and overseas. Our **global precincts** bring together partners to support research and development of global standing and scale. Our **national centres** are research centres of national standing and scale. CSIRO hosts Australia's national **research facilities** and scientific **collections** that are available to Australian and international users. **Collaboration hubs** are spaces dedicated to translating research outcomes to industry. **Testing service centres** provide testing and certification services for industry.

Global precincts
 Canberra – National Agricultural and Environmental Sciences Precinct
 Brisbane – Ecosciences Precinct
 Perth – National Resource Sciences Precinct
 Clayton – Australian Manufacturing and Materials Precinct

National centres
 Sydney – Digital Services
 Hobart – Marine and Atmospheric Sciences
 Adelaide – Food, Health and Nutrition
 Perth – Space Sciences
 Townsville – Tropical Innovation
 Newcastle – Energy Technology

As Australia's national science agency and innovation catalyst, CSIRO is solving the greatest challenges through innovative science and technology.

CSIRO. Unlocking a better future for everyone.

Contact us

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For further information
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Cover: Methane emissions from cattle (top picture) can be reduced by more than 80 per cent when they're fed an additive based on the seaweed *Asparagopsis* (bottom picture). Using IP from CSIRO, Meat & Livestock Australia and James Cook University, we created the company FutureFeed to commercialise this solution from science.
Credit: Andrew McInnes austockphoto.com.au (top), CH4 Global (bottom).