



Climate Services and ICT Linkages

Mahesh Prakash

CSIRO's Data61

25th October 2024

Australia's National Science Agency





Contents

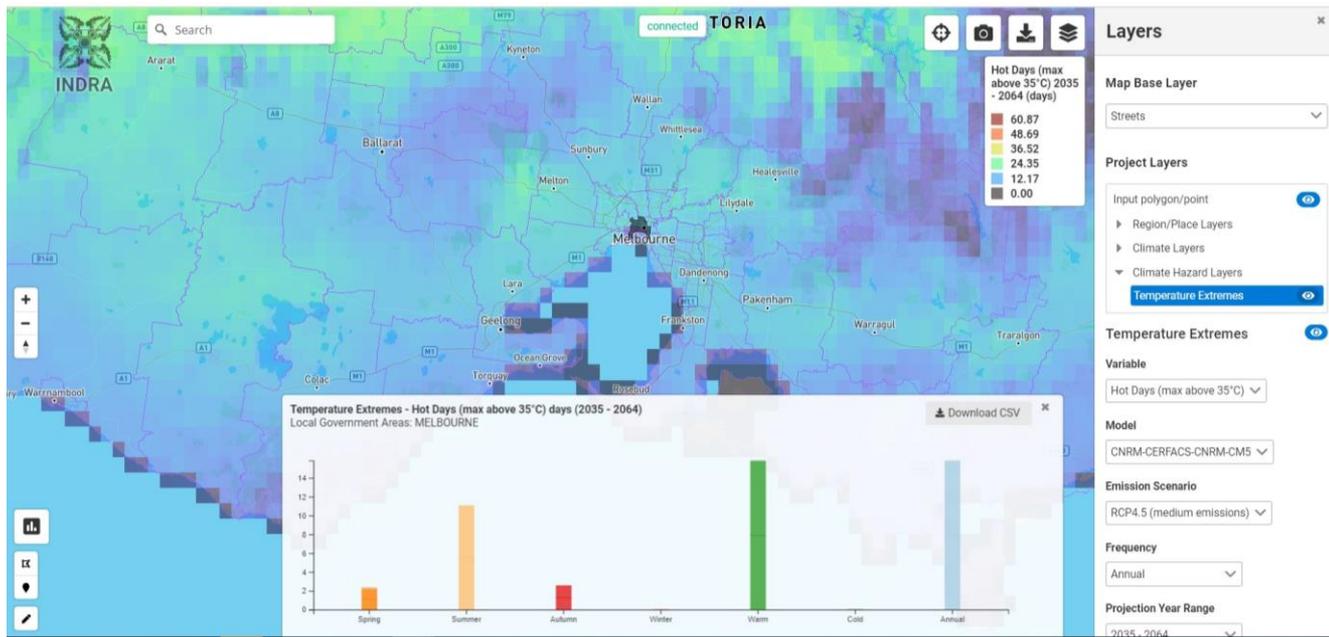
1. Context
2. Team Expertise
3. ICT and Climate Services in the Pacific
4. Use Cases



Context

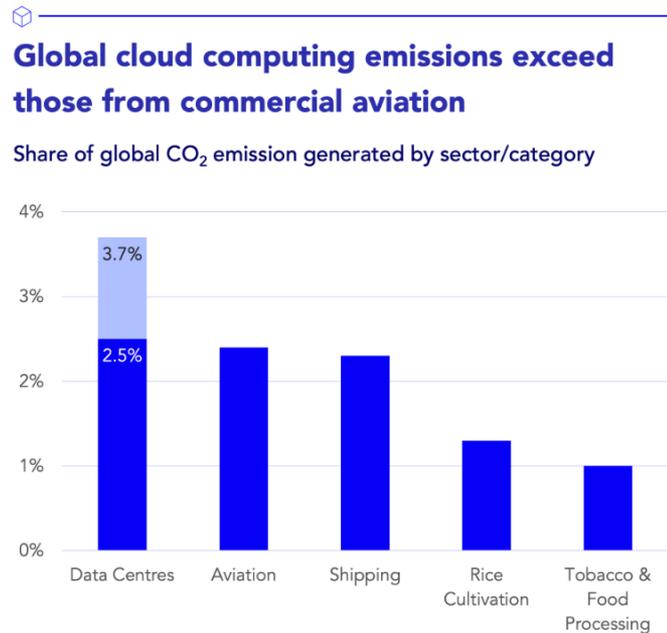
Increasing need for Climate Services

1. Planning
2. Preparation
3. Recovery
4. Response



Climate Change has necessitated a bigger focus on Planning and Preparation. This requires good quality granular sector specific climate information for the Pacific

- Increasingly Data Centres are becoming source of emissions contributing to climate change
- Data Centres are constructed in climate risk prone areas due to low cost of land especially in developing countries.



Source: [Climateiq](#) Analytics



Team expertise

Our domain expertise



Infrastructure



Agriculture



Urban planning



**Emergency
management**



Health



Energy



Water

Our domain expertise

Climate modelling and downscaling

Hazards modelling and analytics

- Wildfires, Modelling (<https://research.csiro.au/spark>)
- Floods and Coastal Inundation, Modelling (<https://research.csiro.au/swift>)
- Extreme Temperature, Analytics
- Extreme Rainfall, Analytics
- Heatwaves, Analytics
- Droughts, Analytics
- Extreme Wind, Analytics
- Wildfire Index, Analytics

Risk Assessment using IPCC framework

- Climate Hazard data from previous expertise
- Exposure data (eg: Infrastructure location, Population)
- Vulnerability data (eg: Infrastructure age, Demographics)



Multi-hazard financial risk modelling

- Financial model wraps around the IPCC risk assessment

Digital delivery of online product for ongoing use using CSIRO's INDRA platform

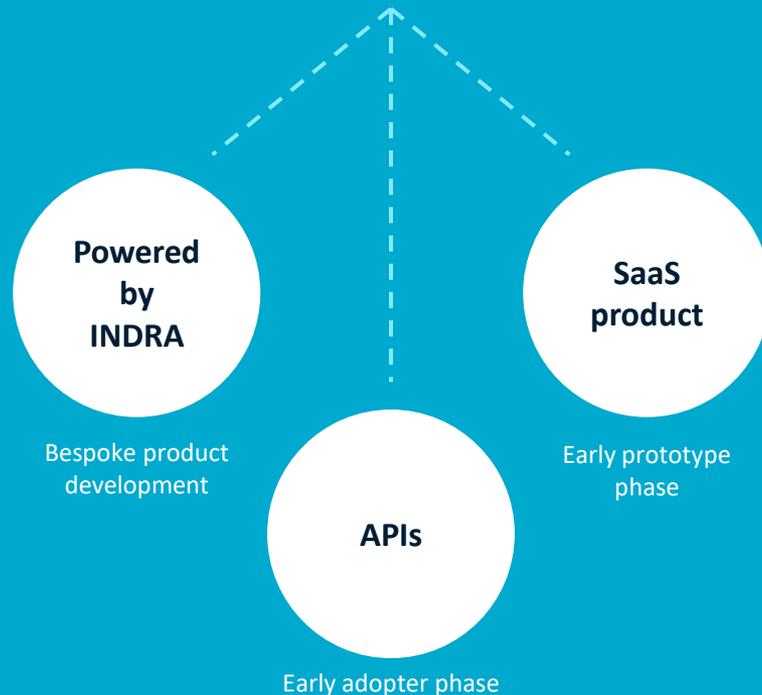
<https://research.csiro.au/indra>

The capabilities above can be applied to any domain

What we offer

- Data** High resolution historical and projected climate data, including climate extremes data
- Data transformations** Transformations that convert climate data into forms that are easily consumed within existing workflows (eg: GIS, CSV, ASCII etc.). This makes INDRA interoperable with standard software such as ArcGIS, QGIS, PowerBI, Excel and others
- API provisions** API end points that are fit-for-purpose to integrate with existing workflows that are driven by standard software such as ArcGIS, QGIS, PowerBI, Excel and others
- SaaS product** A map-based frontend in development for users with end-to-end visual analytics needs
- Other data** In development for users with a need to integrate climate data with sectoral data such as population/demographics, infrastructure, terrain and soil to name a few. These datasets can either be integrated within INDRA or can be integrated externally via our API service offering

INDRA platform





ICT Challenges in the Pacific



ICT, Climate and the Pacific

- Digital Transformation
- Digital Innovation and Entrepreneurship
- Digital Infrastructure
- Digital Security and Trust
- Digital Capacity and Skills Development
- Regional Cooperation and Representation



Evidence Based Climate Adaptation & Mitigation

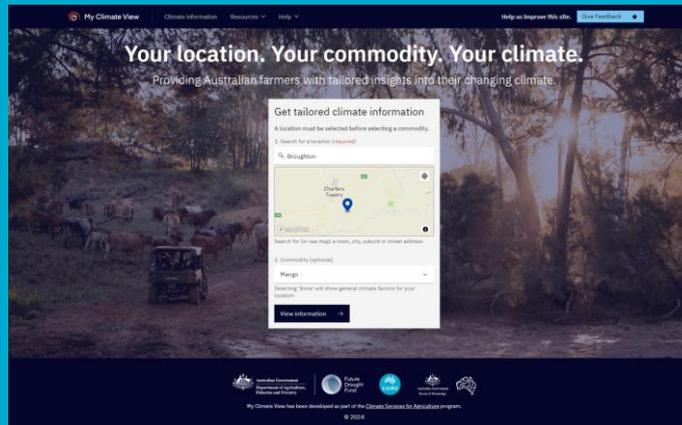


Use cases

Climate Services for Agriculture

- Helping farmers to adapt to climate variability and related trends and thereby improving the viability of their businesses
- Presenting the historical, seasonal and future climate at one location, including:
 - historical data (1961-current)
 - seasonal forecasts (1-3 months)
 - future climate projections (2030, 2050, 2070)
- Delivered by CSIRO and the Bureau of Meteorology Research, using a **collaborative design process with end users**
- Funded by the Future Drought Fund

INTERNAL. This information is accessible to ADB Management and Staff. It may



Capability

Relevance

Climate modelling & downscaling



Hazards modelling & Analytics



Risk Assessment



Financial Modelling

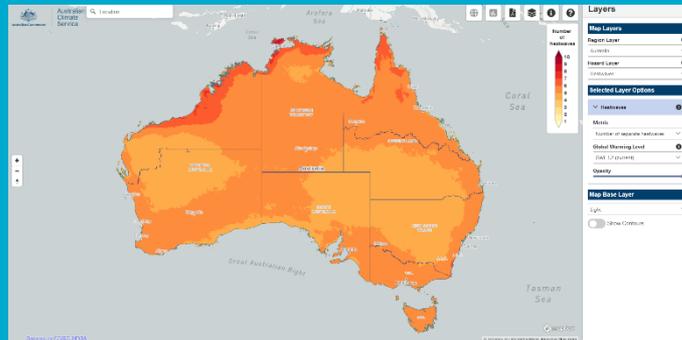


Digital delivery



Australian Climate Service Hazards Portal

- Helping Australia's National Emergency Management Agency (NEMA) to evaluate and manage the impact of climate change at national scale
- Funded and supported by the Australian Climate Service
- Hazards information from the ACS Hazard Portal feeds into the National Climate Risk Assessment for Australia



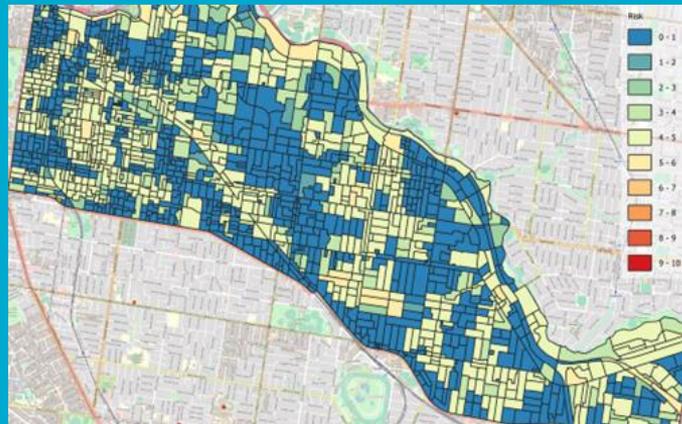
Capability

Relevance

Climate modelling & downscaling	✓
Hazards modelling & Analytics	✓
Risk Assessment	✗
Financial Modelling	✗
Digital delivery	✓

NCRA Australia: Infrastructure

- Leading Australia's National Climate Risk Assessment for Critical Infrastructure
- Developing and delivering capability for the Department of Climate Change, Environment and Water via the Australian Climate Service
- Critical Infrastructure includes Telecommunications, Energy and Transport in phase 1
- Critical Infrastructure may include Health and Water in future phases
- Infrastructure may also include Housing and Commercial establishments in future phases



Capability

Relevance

Climate modelling & downscaling



Hazards modelling & Analytics



Risk Assessment



Financial Modelling

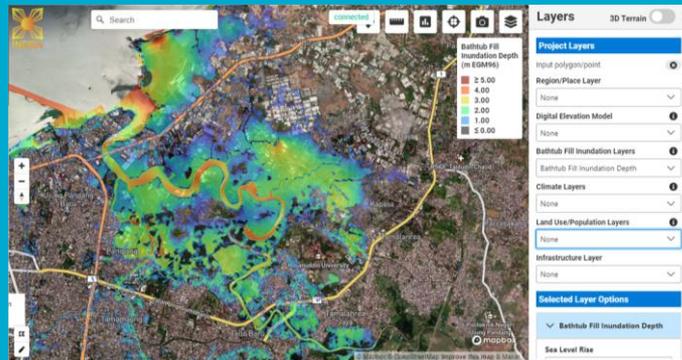


Digital delivery



INDRA Makassar, Indonesia

- Helping urban planners, architects, policy makers and developers to evaluate the impact of climate change on future planning considerations
- Funded by DFAT and the Asian Development Bank under the ASEAN Australia Smart Cities Trust Fund administered by Ramboll
- This is a prototype. Opportunities exist to roll out such capability in other parts of Indonesia and elsewhere



Capability

Relevance

Climate modelling & downscaling



Hazards modelling & Analytics



Risk Assessment



Financial Modelling

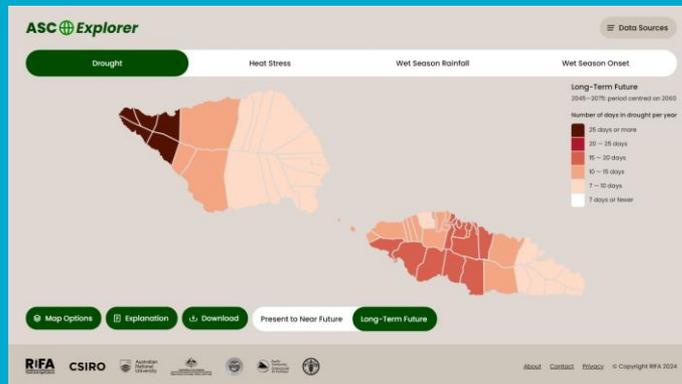


Digital delivery



ASC Explorer, Samoa, Pacific

- Helping the agricultural sector understand and manage the impact of climate change holistically as a food system
- Dealing with the needs of Pacific Island Nations whose agricultural practices are significantly different from Australia
- Utilises a “Food Systems” framing for holistic adaptation outcomes
- Including a range of socio-economic indicators and considerations and applying co-design and GEDSI principles
- Funded by DFAT. Opportunity to extend Pacific Wide



Capability

Relevance

Climate modelling & downscaling



Hazards modelling & Analytics



Risk Assessment



Financial Modelling



Digital delivery





For further information



indra@csiro.au



research.csiro.au/indra

