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PRE-DISASTER MULTI-HAZARD DAMAGE AND ECONOMIC LOSS ESTIMATION MODEL

BNHCRC RAF – Sydney April 2015

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An Australian Government Initiative

CRC AUSTRALIA

THE UNIVERSITY OF MELBOURNE

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THE PROJECT:

PRE-DISASTER MULTI-HAZARD DAMAGE AND ECONOMIC LOSS ESTIMATION MODEL

BACKGROUND TO THE PROJECT:

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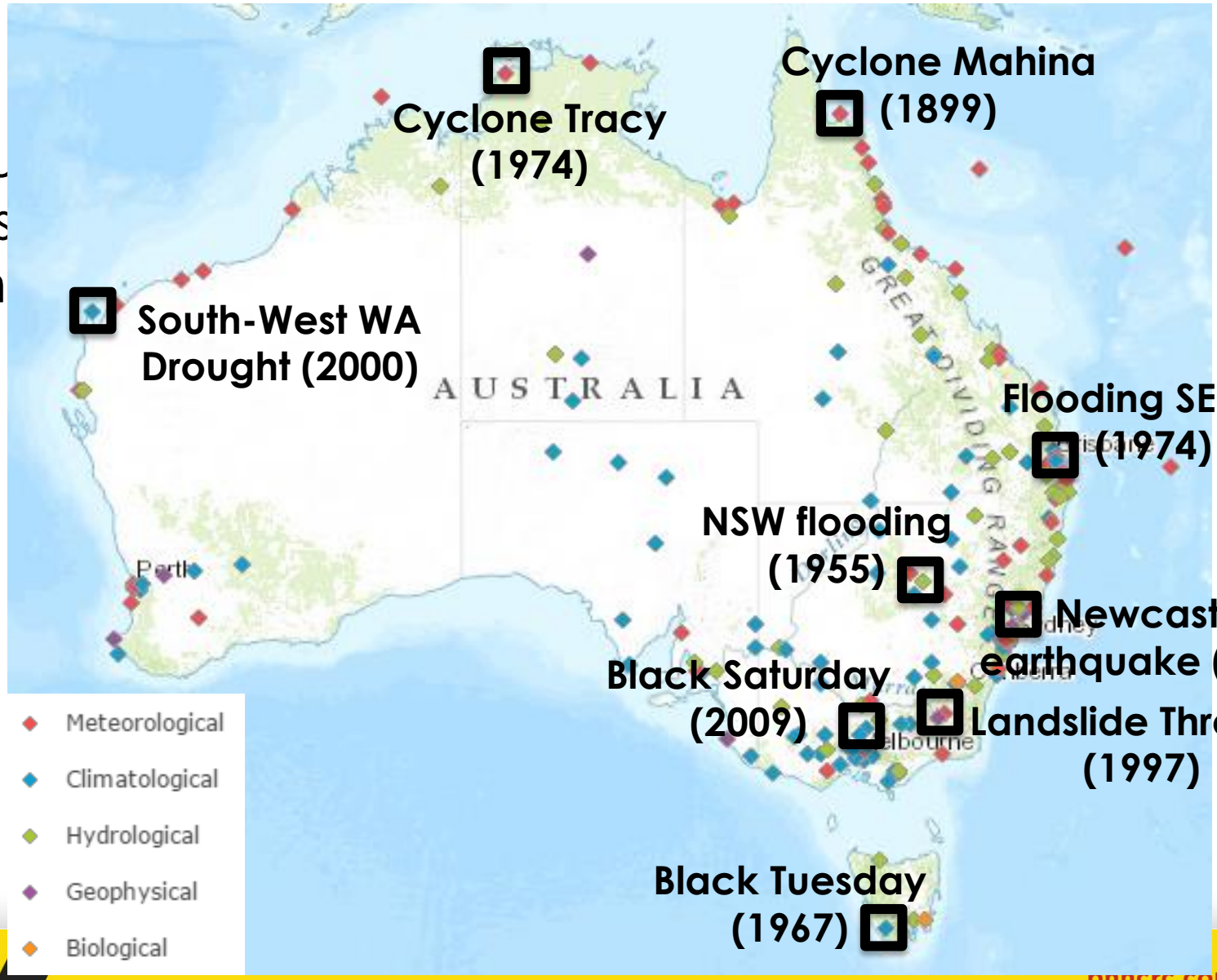


COST OF NATURAL DISASTERS: (1)

On average, the Australian community spends

$1.58 billion

each year in recovering from natural disasters, including the costs of injury and death.

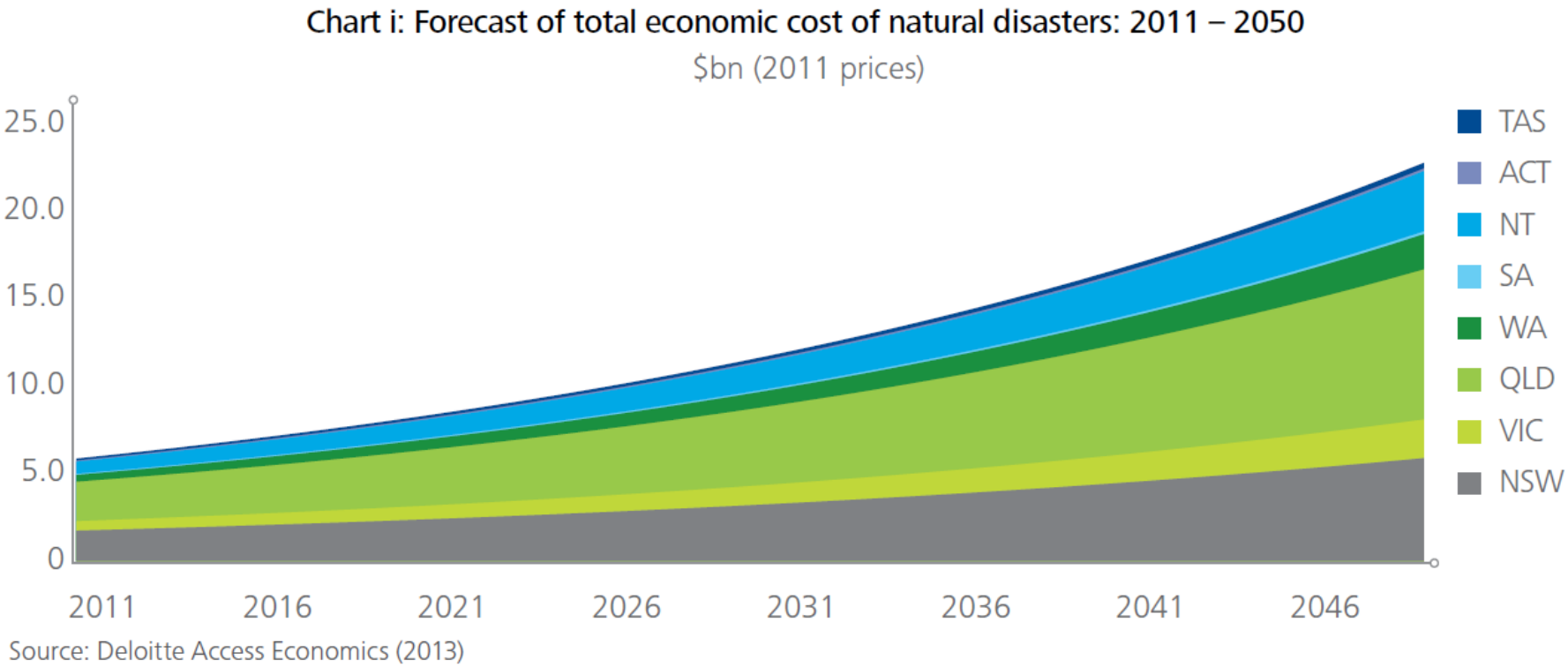
(Geoscience Australia, 2007)

COST OF NATURAL DISASTERS: (2)

In **2012** alone,
the total economic cost of natural disasters
in Australia
is estimated to have exceeded

$6 billion

COST OF NATURAL DISASTERS: (3)



Source: Deloitte Access Economics (2013)

This statistic, which includes the costs carried by individuals, governments, businesses etc., along with the rapid economic growth in Australia, makes natural disasters a **significant issue for policy makers**.

PROBLEM:

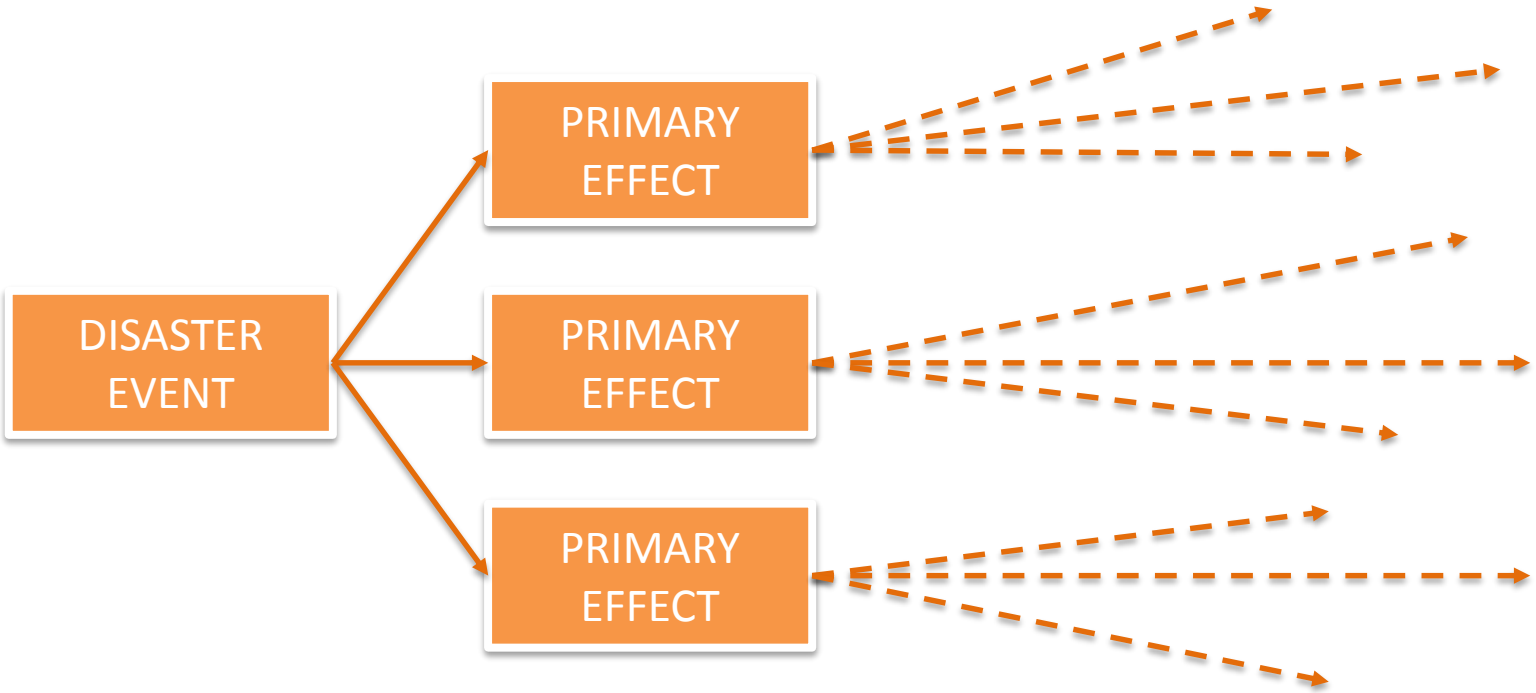
One of the substantial issues identified in this connection is the **inability to estimate the full economic impact of natural hazards**, considering **all the affected sectors** of the economy.

19 sectors as identified in the National Accounting System of Australia:

- agriculture, forestry and fishing
- Mining
- Manufacturing
- food, beverage and tobacco products
- electricity, gas, water and waste services
- construction
- wholesale trade
- retail trade
- accommodation and food services
- transport, postal and warehousing
- information media and telecommunications
- financial and insurance services
- rental, hiring and real estate services
- professional, scientific and technical services
- administrative and support services
- public administration and safety
- education and training
- health care and social assistance
- arts and recreation services
- other services

RESEARCH PROBLEM

The calculation of impact and cost should consider not only the **primary effects** of the natural disasters, but also its **secondary effects** due to losses propagated through the economy due to inter-sectoral linkages.

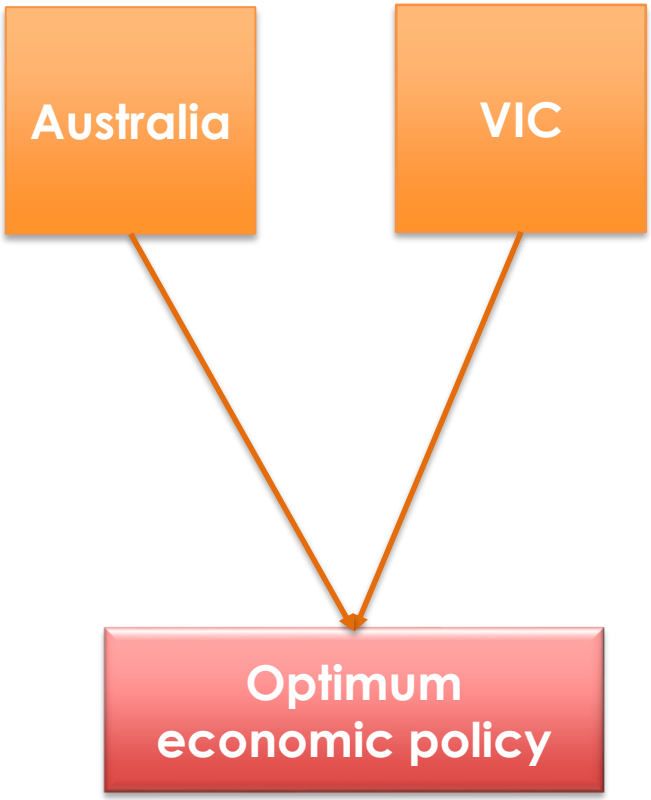


PROJECT OVERVIEW

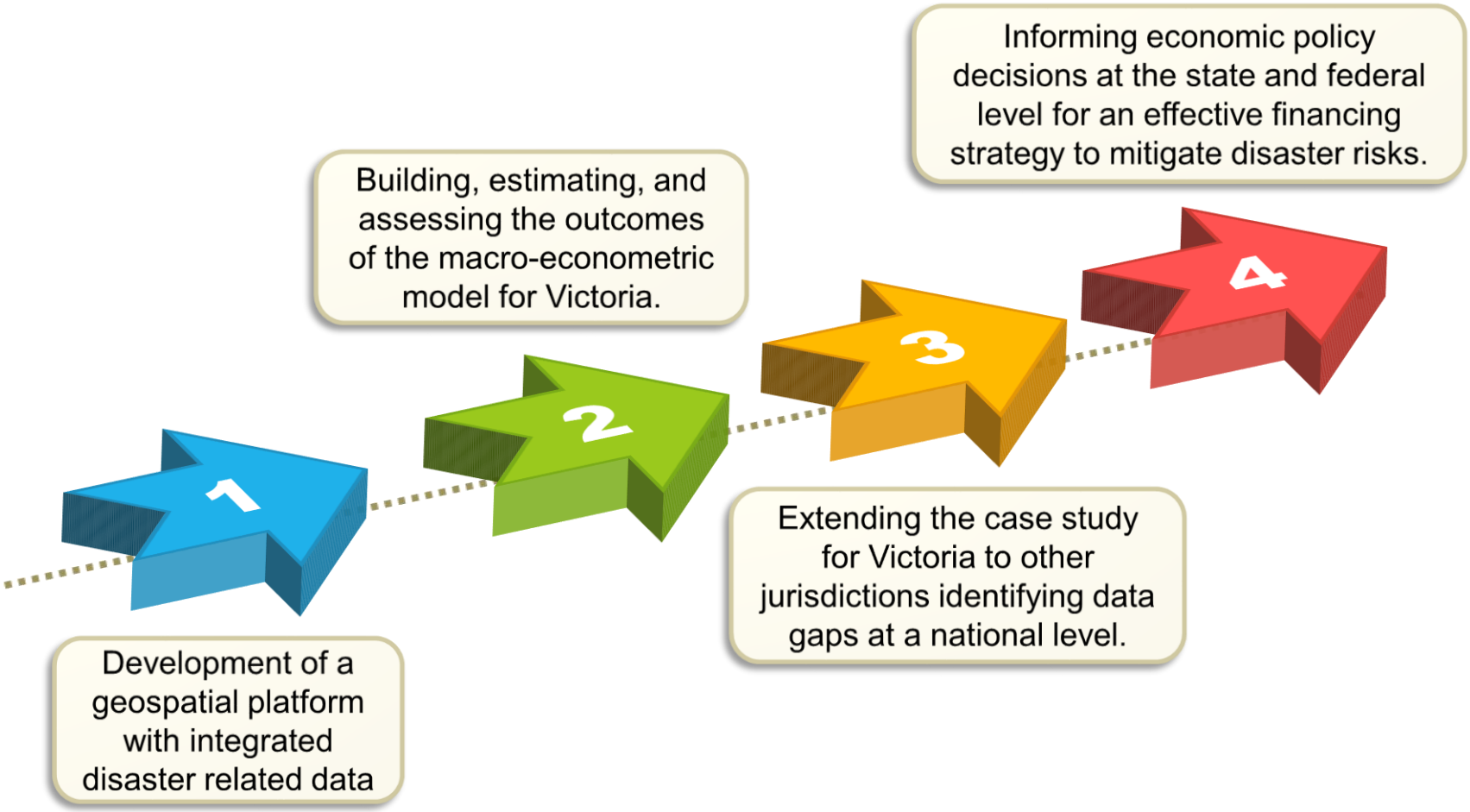
1) at the national level it will analyse the total impact of natural disasters on sectoral growth of the Australian economy

2) For the state of Victoria, it will assess the multi-hazard risks, and estimate the potential damages and economic losses at a finer geographic space

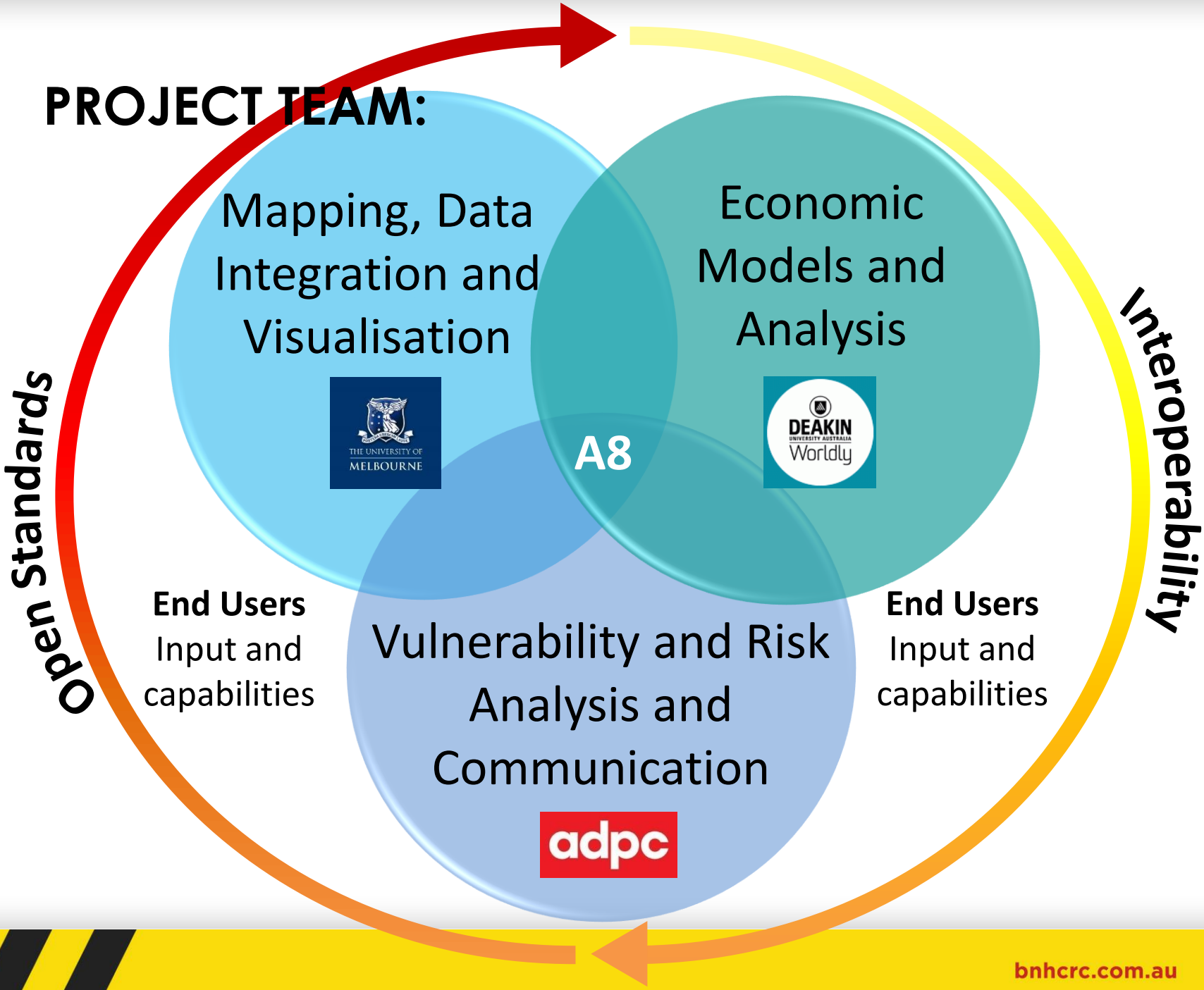
3) This will be followed by identifying the optimum economic policy options to recover/minimise such adverse effects



PROJECT PHASES:



PROJECT TEAM:



DATA OUTCOMES, PROJECT OUTPUTS AND ACHIEVEMENTS

DATA OBTAINED (1)

Economic Measures

1. Sector-specific Gross State Product (GSP) of all states from 1990 to 2014
2. Journey to Work (JTW) Dataset that provide sector-specific total number of employees at a finer geographic unit
3. Disaggregated sector-specific GSP in Victoria at a finer geographic unit

DATA OBTAINED (2)

Natural Disasters

4. Natural disasters data on their magnitudes and location

DATA OBTAINED (3)

Multi-Hazard Disaster Risk Assessment in Victoria

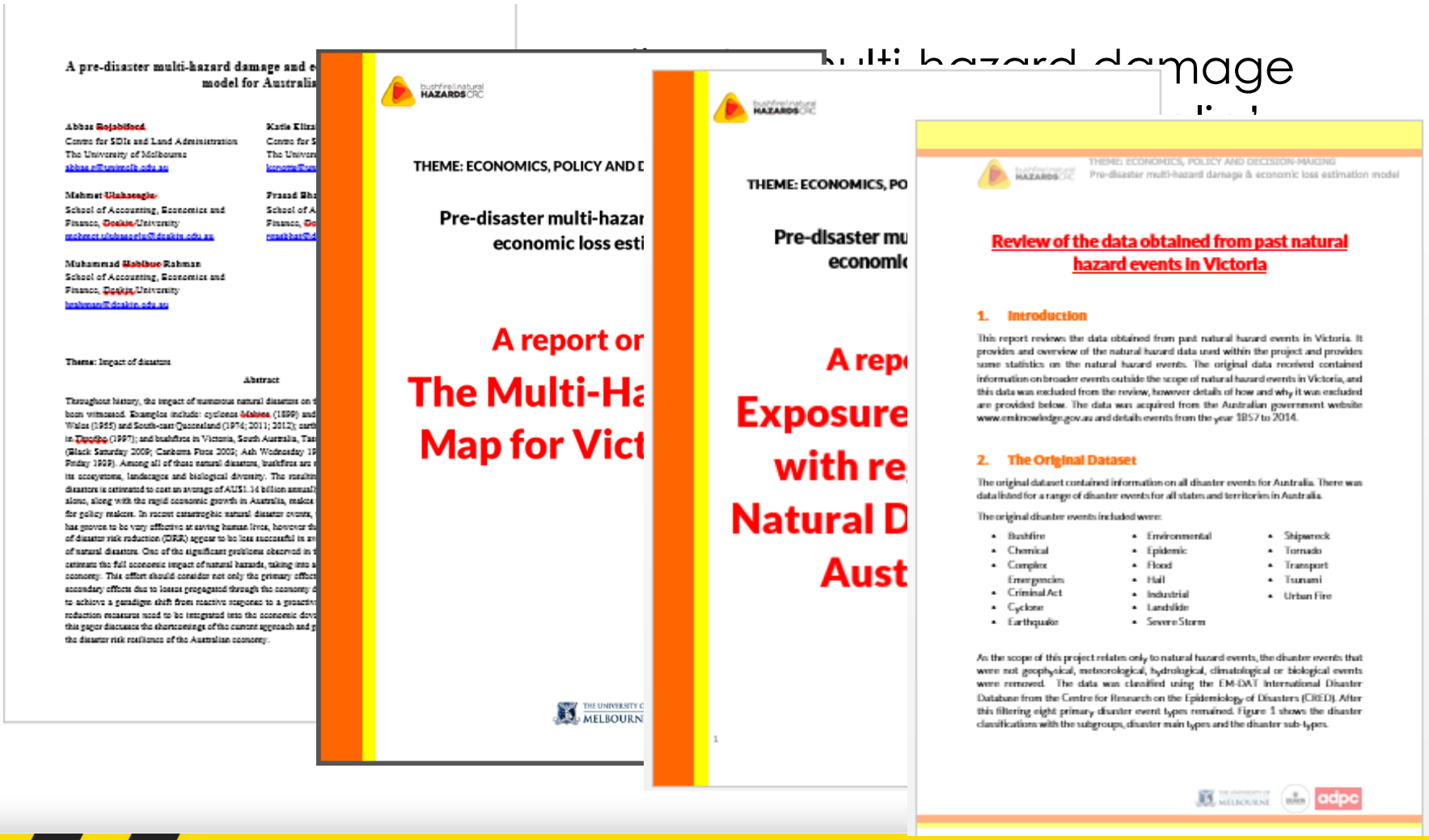
5. Hazard maps: Earthquakes, bushfires and floods
6. Exposure map: NEXIS data

DATA OBTAINED (4)

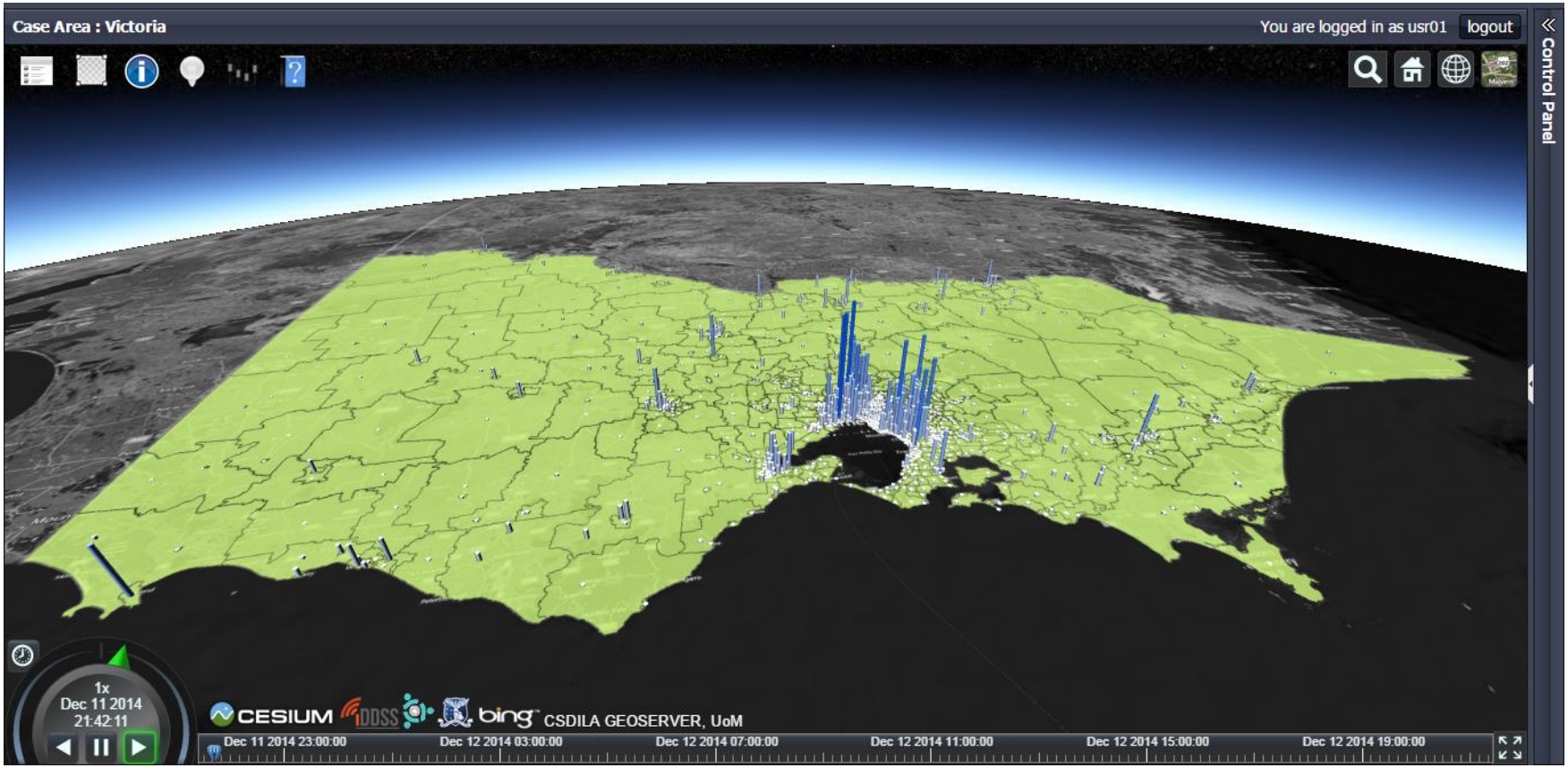
Climate Change Variables

7. Data on excessive rain and extreme temperature

PROJECT OUTPUTS: REPORTS AND PAPERS



PROJECT OUTPUTS: DEVELOPMENTS



PROJECT ACHIEVEMENTS: GENERAL

1) Data and economic method to estimate the full effect of natural disasters on sectoral economic growth of Australia

Which will lead to:

1) Improved ability to advise appropriate budget allocations and project rankings for policy makers

NEXT STEPS

UPCOMING DELIVERABLES

1) Estimation of the relationship between natural disasters and sectoral economic performance at national level
2) Exposure and vulnerability maps for Victoria
3) Estimation of the localised (both direct and indirect) effects of natural disasters on economic sectors in Victoria

RESEARCH TEAM

- Prof. Abbas Rajabifard (UoM – project leader)
- A.Prof. Mehmet Ulubasoglu (Deakin)
- A.Prof. Nelson Lam (UoM)
- Dr. Mohsen Kalantari (UoM)
- Dr. Prasad Bhattacharya (Deakin)
- Dr. Peeranan Towashiraporn (ADPC)
- Dr. Habib Rahman (Deakin)
- Dr. Yiqun Chen (UoM)
- Dr. Katie Potts (UoM)

- Roozbeh Nafari (UoM – PhD student)

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End User's Perspective

Martine Woolf
Geoscience Australia

Third Research Advisory Forum, Sydney

Date: 09 April, 2015

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SCOPE OF THE PRESENTATION

- What the project is about
- Value of the project
- End user interaction

OVERALL GOAL OF THE PROJECT:

National Level

- Identifying the impact of natural disasters on sectoral economic growth in Australia to help guide federal budget allocation.

State Level

❶ Spatially enabled hazard specific risk assessment information (physical damage assessment for bushfires, floods)

❷ Natural hazard economic loss estimation and geographic distribution of it by capturing the localised effects of disasters

❸ Rank the economic sectors in terms of their disaster vulnerability to advocate for resource reallocation accordingly

VALUE OF THE PROJECT:

END USER INTERACTION: