



Australian Government  
Geoscience Australia

## NATIONAL EXPOSURE PROFILE FOR EVIDENCE BASED CLIMATE CHANGE ADAPTATION

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### Risk Assessment Framework

Earthquake  
Tsunami  
Floods  
Cyclones  
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Infrastructure  
Failure

**Hazard**

**RISK**

**Vulnerability**

Engineering  
Economic  
Social  
Casualties  
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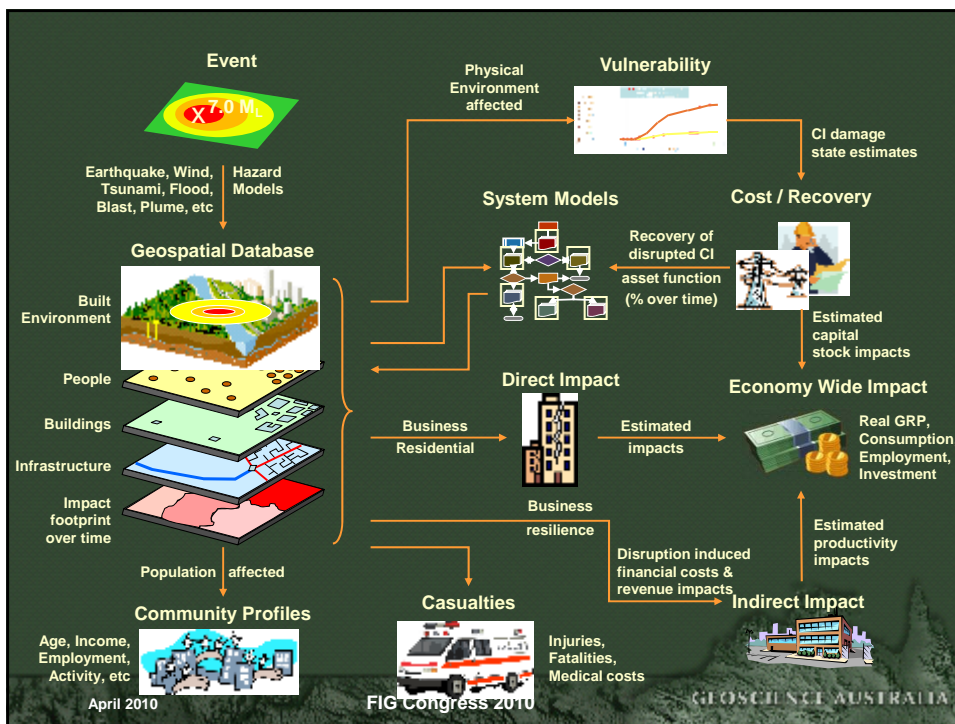
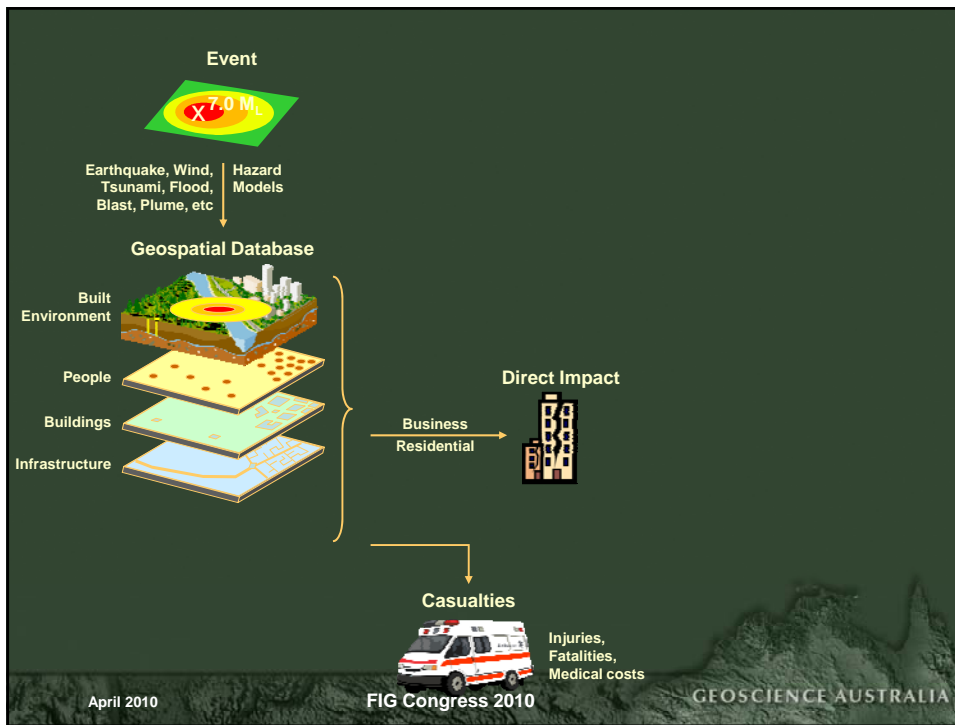
**Exposure (NEXIS)**

People, Buildings, Businesses  
Infrastructure, Lifeline Utilities  
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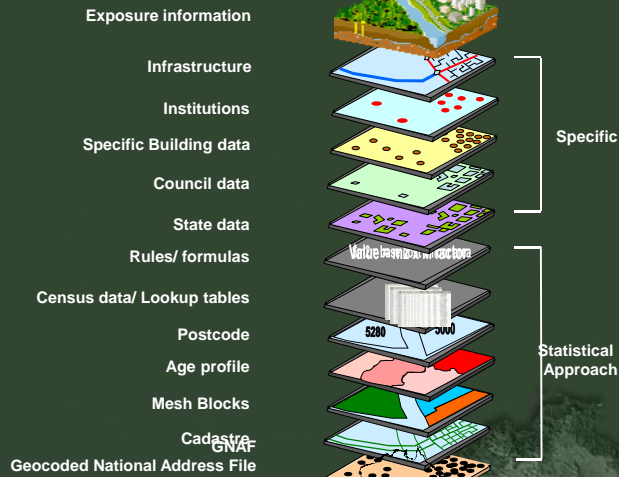
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## Development of NATIONAL EXPOSURE INFORMATION SYSTEM (NEXIS)

Nationally consistent and at buildings level

Two phases : Statistical for immediate needs & refine with specific



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## Development of NATIONAL EXPOSURE INFORMATION SYSTEM (NEXIS)

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### Residential

#### Spatial

Latitude  
Longitude  
Address  
Block size  
Floor area

#### Structural

FCB type  
Roof type  
Wall type  
Storeys  
Age

#### Demographic/ Economic

Income group  
No. Residences  
No. People  
Structural value  
Content value



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### Business

Spatial	Latitude Longitude Address Block size Floor area
Structural	Façade / Wall type Structural system Storeys Basement Car parks Age
Demographic/ Economic	Structural value ANZSIC category No. Businesses Customer Capacity



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## Development of NATIONAL EXPOSURE INFORMATION SYSTEM (NEXIS)

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### Institutions

	Health	Educational	Emergency	Government	Cultural	Recreation
Spatial	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Structural	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Type	Hospitals Medical services Nursing home	Pre school Primary Secondary Tertiary	Police Ambulance Fire – urban Fire – rural Emergency services Emergency mgmt	Department Services	Museum Religious centre Library	Sport oval centre stadium Race Tennis Golf courses
Capacity	Staff Volunteers Patients No. beds No. theatres	Staff Volunteers Students Bathrooms Showers Toilets	Staff Volunteers Vehicles	Staff	Staff Volunteers Visitors	Staff Volunteers Visitors Bathroom Showers Toilets

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## Development of NATIONAL EXPOSURE INFORMATION SYSTEM (NEXIS)

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### Infrastructure

	Communication	Energy	Water	Transport
Spatial	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Structural	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Type	Broadcasting radio AM/FM TV Telecommunication mobile microwave internet (wireless) Earth stations laser/NASA	Electricity power/ sub stn Gas Liquid Fuel extraction processing storage locations	Water supply catchments water source treatment transfer pumping stations	Road Rail Bridges/tunnels Airports Sea ports
Networks	Antennae Towers Coverage	Transmission lines Distribution regions	Transmission pipes Reticulation regions	Road Rail
Capacity	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

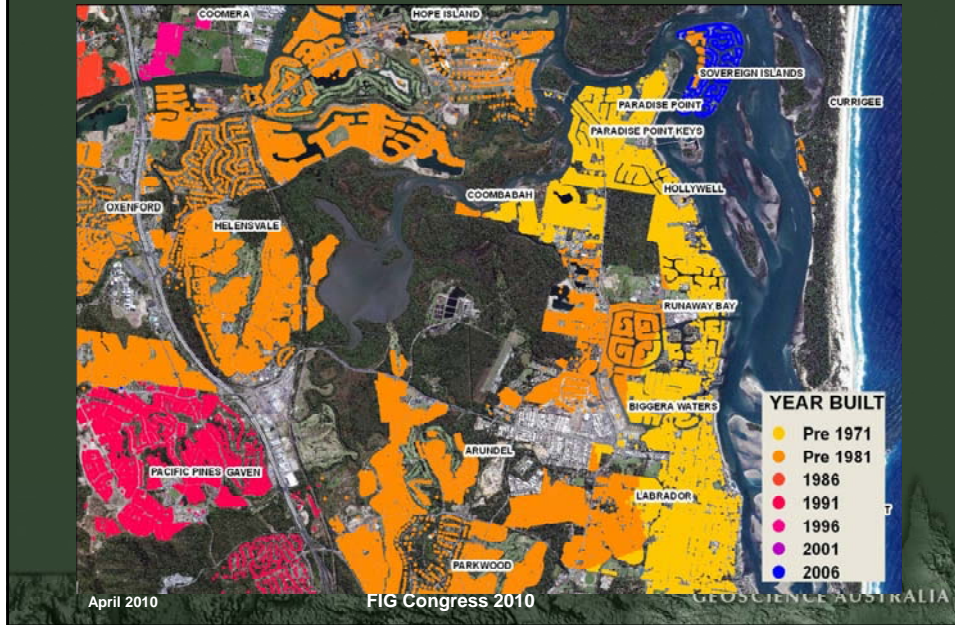
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## Buildings Age Profile – Gold Coast



## National Exposure Profile

Type	Number of Buildings & Length	Replacement Value (\$ billion)
Residential	7.7 Million	1,896
Commercial	0.22 Million	2,036
Small – medium industrial	0.16 Million	141
Total Buildings	8.01 Million	4,073
Freeways	3,300 km	1,155
Highways	60,474 km	514
Main roads	92,331 km	554
Local roads	445,883 km	386
Bridges (Total)	2,893 km	
Tunnels (Freeways)	52 km	

Based on 2008 data & cost factors



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## National Residential Exposure Profile

Type	Number of buildings (1000s)	Replacement Value (\$ billion)
ACT	112	30.79
NSW	2,009	570.24
NT	48	12.21
QLD	1,656	424.04
SA	724	127.93
VIC	2,098	469.22
TAS	222	56.54
WA	827	205.29
<b>TOTAL:</b>	<b>8,077</b>	<b>4,073.44</b>



Based on 2008 data & cost factors

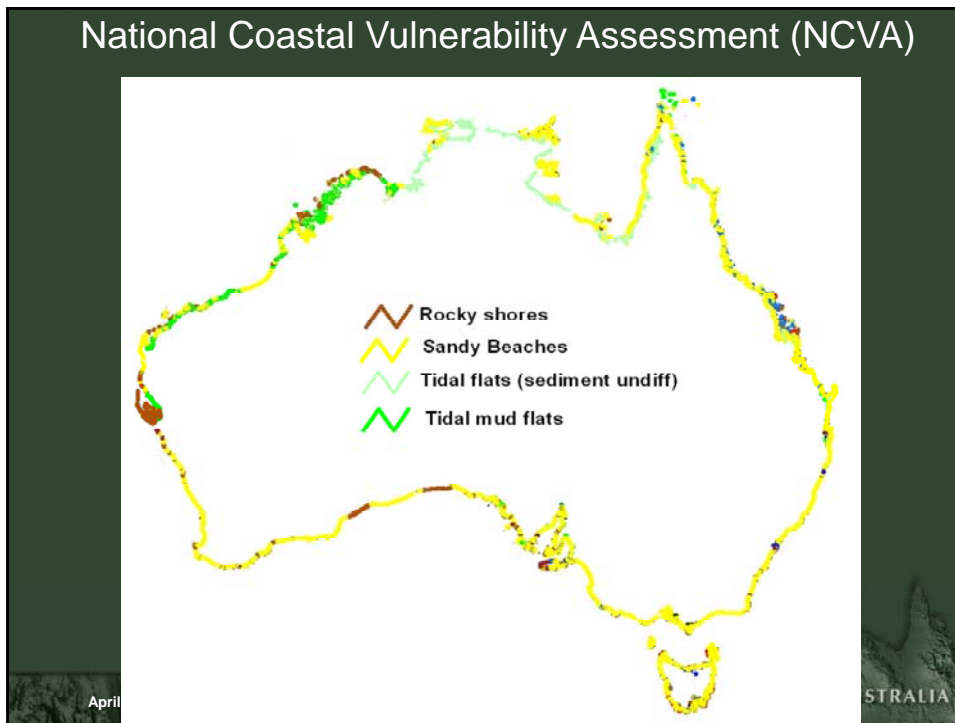
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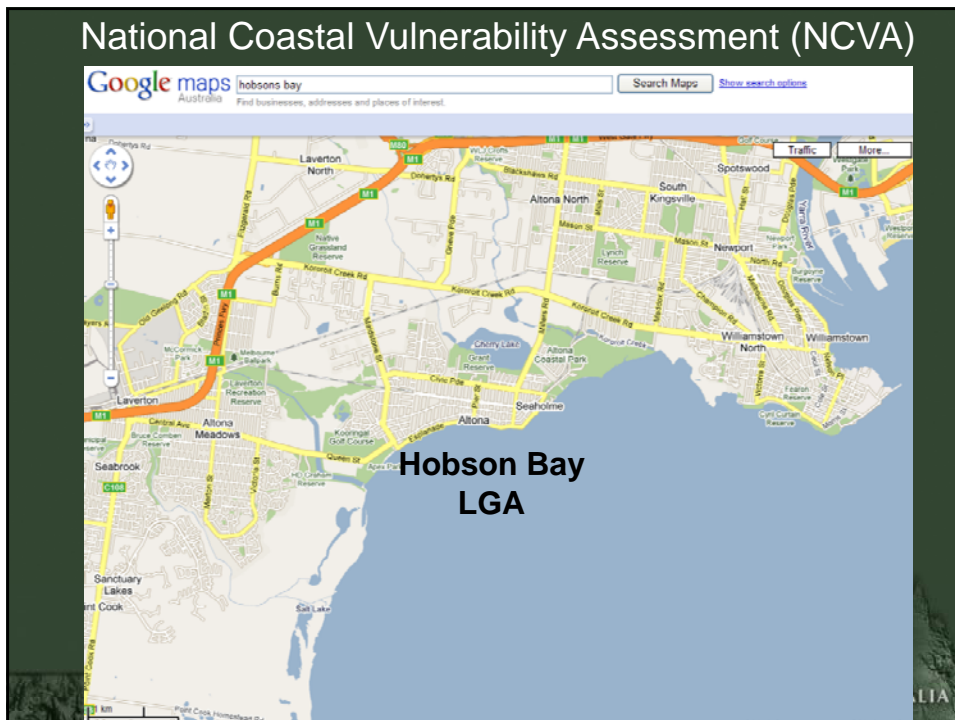
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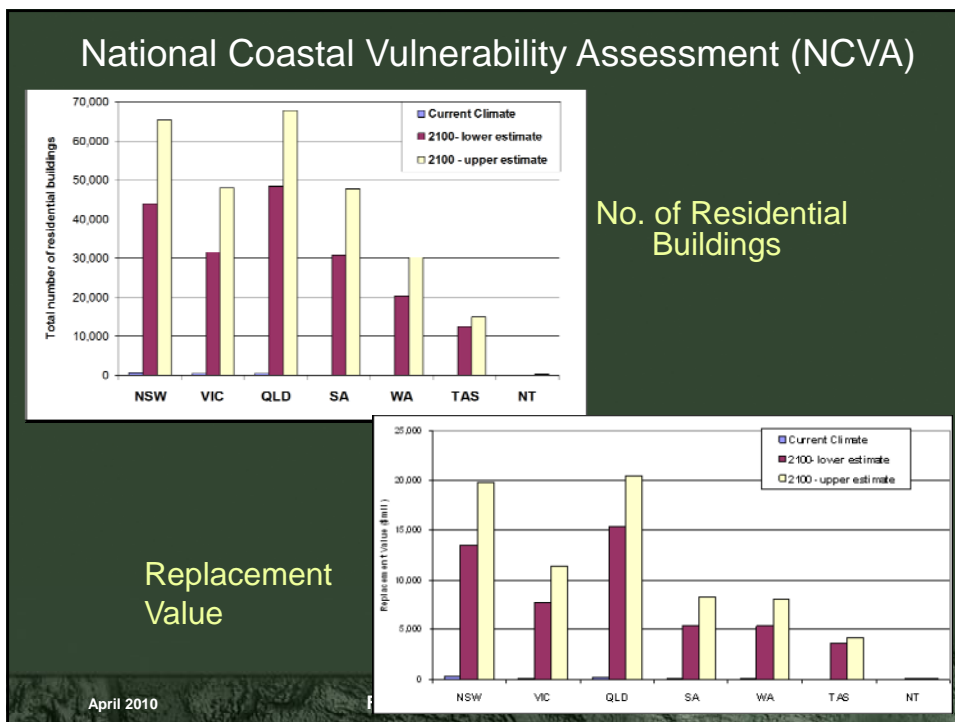
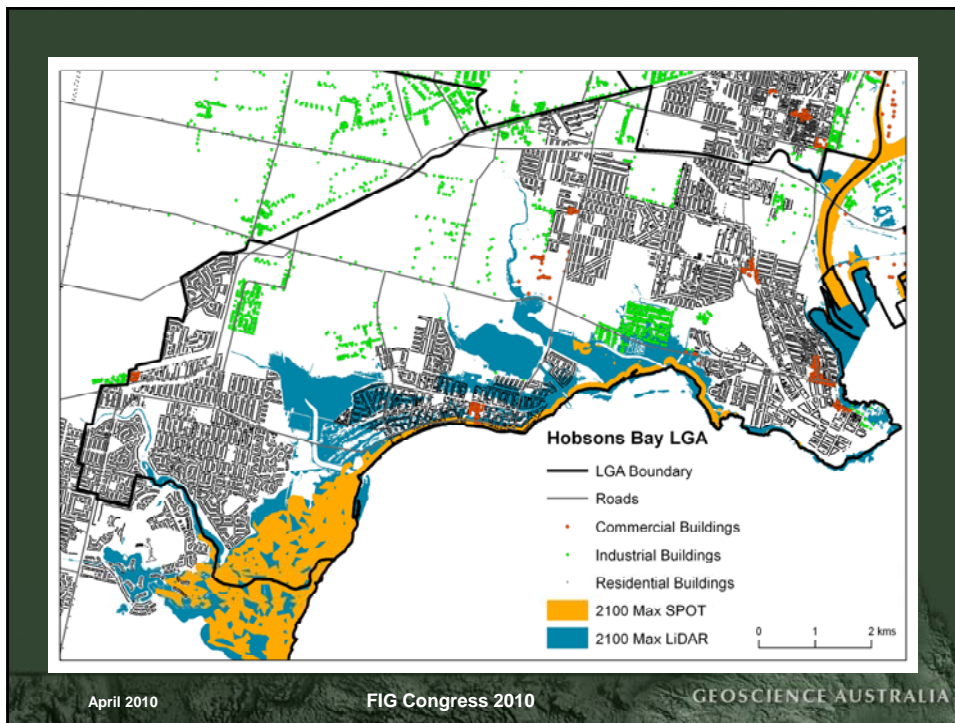
## National Coastal Vulnerability Assessment (NCVA)



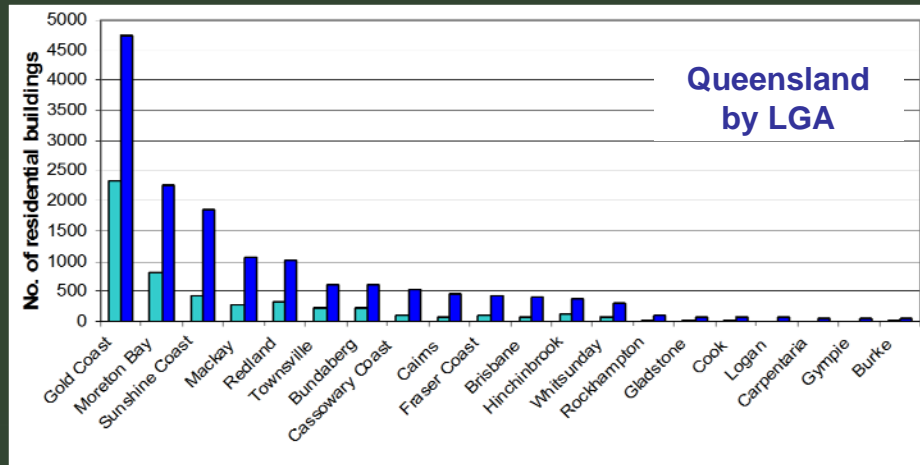
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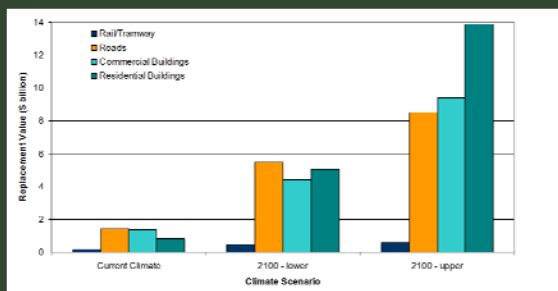


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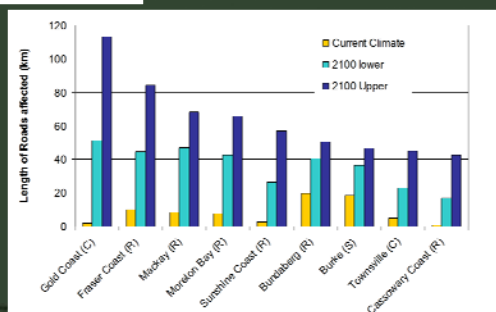
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## National Coastal Vulnerability Assessment (NCVA)



Replacement Values

Length of Roads



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## Future Directions : Temporal Dynamics

### Population Dynamics

- micro momentum (intraday)
- macro momentum (intraweek)
- seasonal / event momentum

*To understand the current infrastructure usage & population demographic exposure to rapid onset of events .*



### Exposure Projections

- based on population projections
- statistical approach



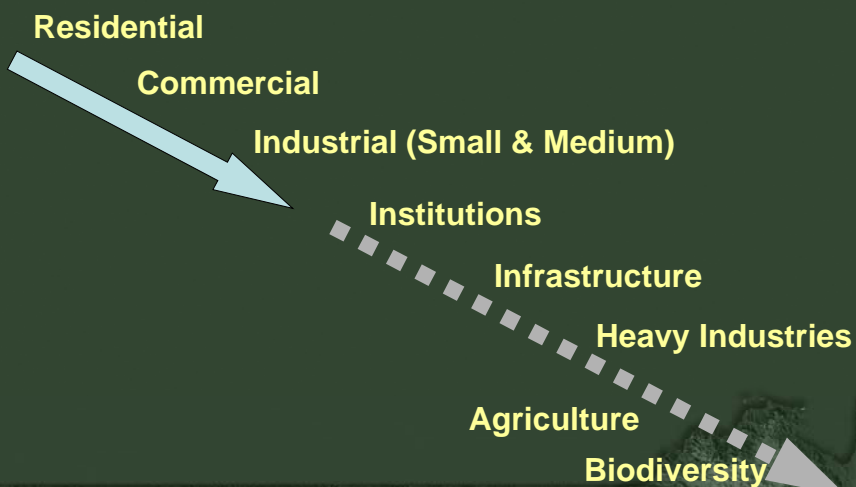
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## Development of NATIONAL EXPOSURE INFORMATION SYSTEM (NEXIS)

### National Sectors



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## Future Directions : Summary

### NEXIS - Specific Version

Hazardous Material & Primary Industries

Activity Models Development

Global Exposure Information System

Decision Support Tools

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## Comments

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