

Climate

Change

and Thailand

disaster risk assessment and the insurance
coverage of natural hazards in Thailand
going forward?

2nd Conference of the OECD International Network
on the Financial Management of Large-Scale Catastrophes

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Bangkok, Thailand
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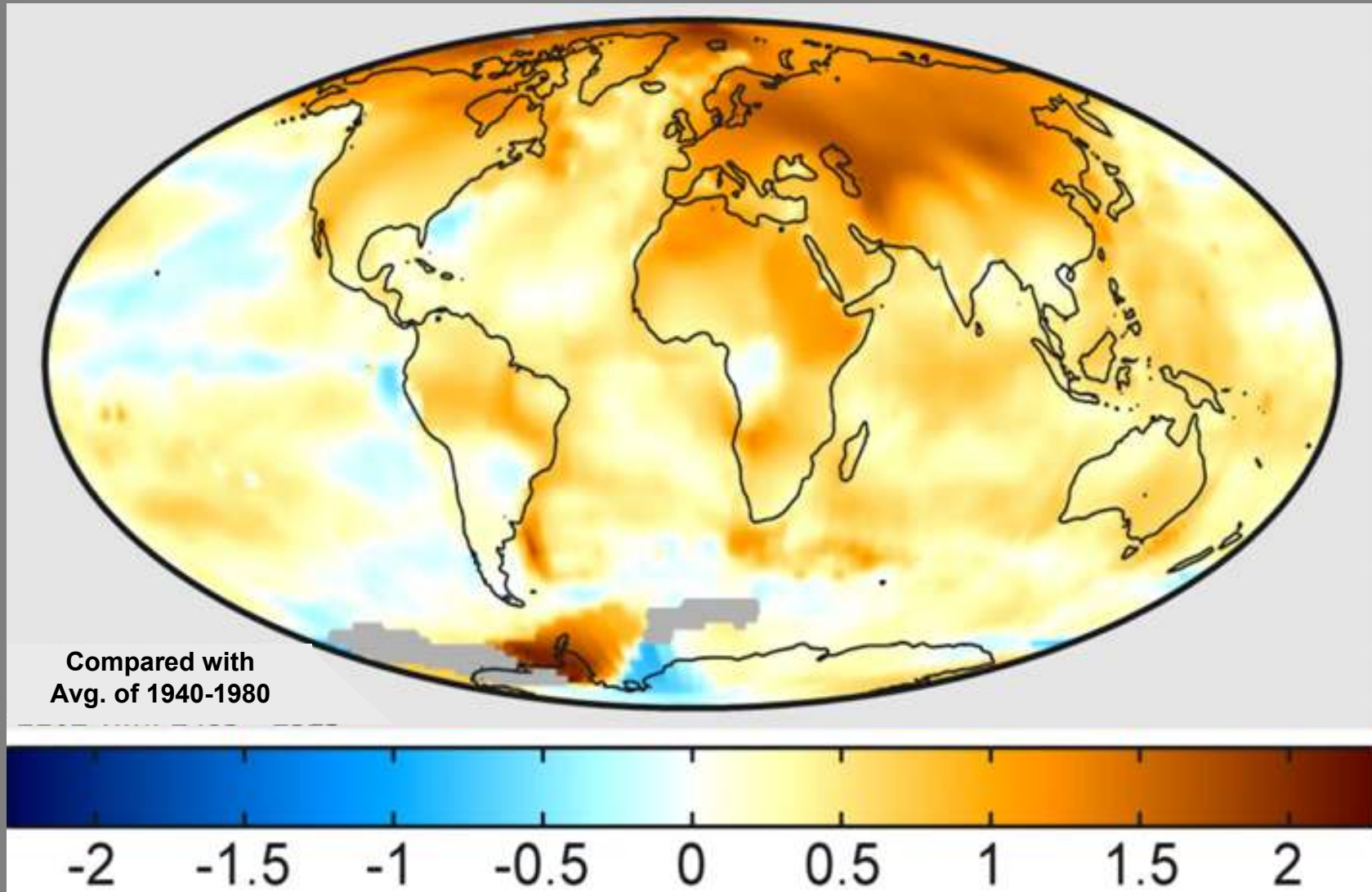


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- General background
- Potential impacts on Thailand
- Country disaster risk profile & key statistics of natural disasters in Thailand
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- Example of what could be done: a hand calculation

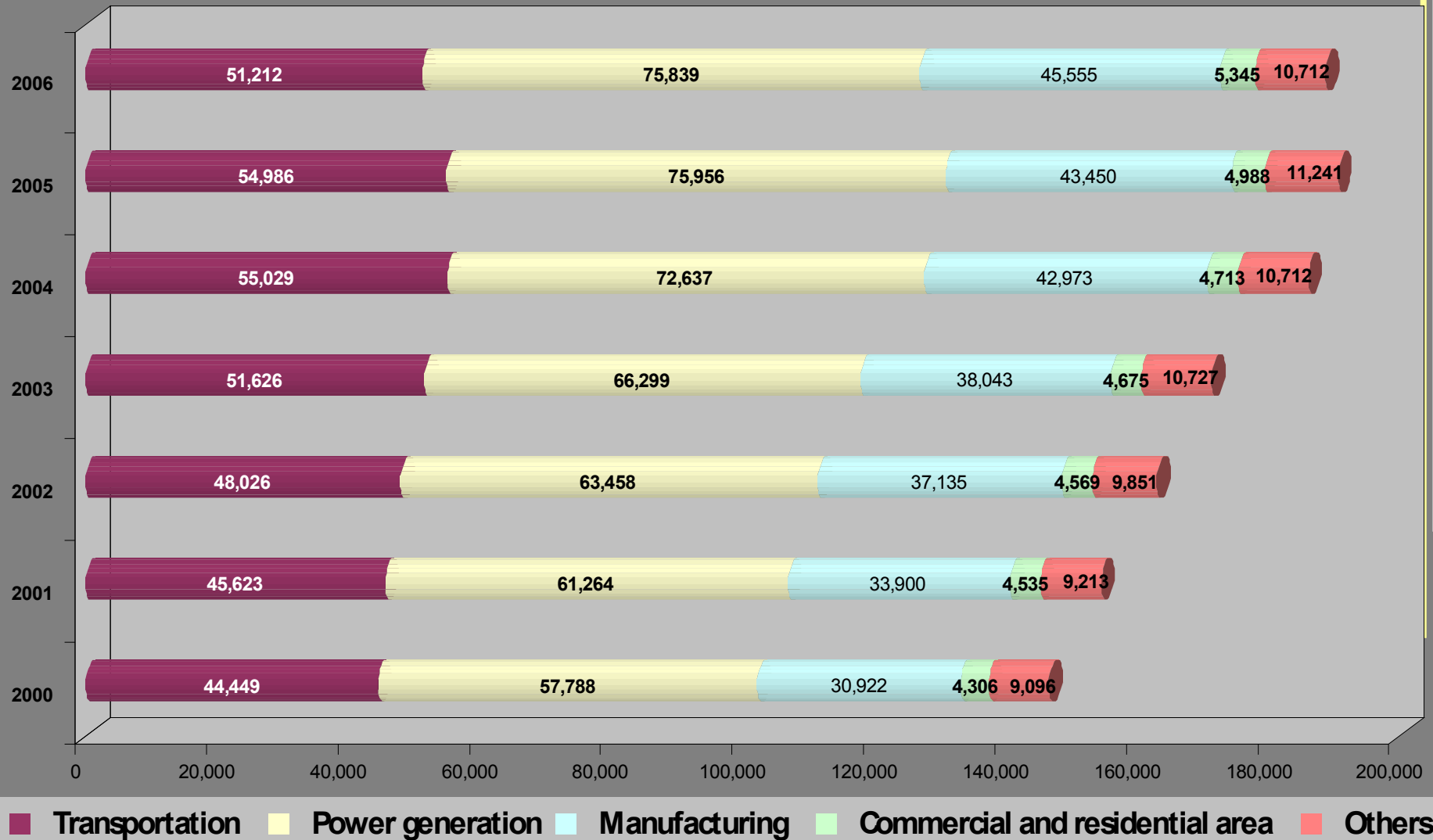


Rising Temperature (°C)



Thailand CO₂ Emission

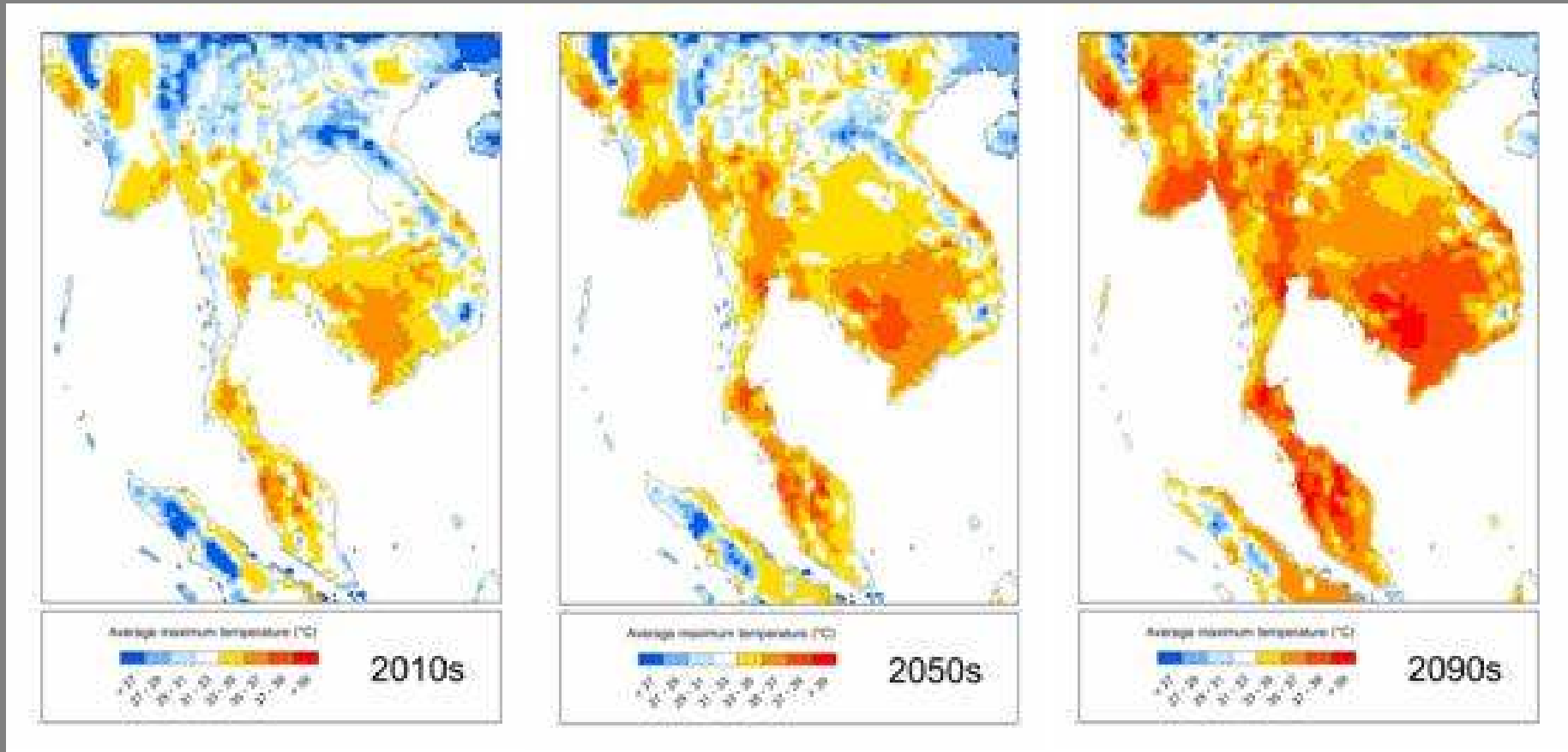
Unit: 1,000 metric ton



Source: Department of Alternative Energy Development and Efficiency, Ministry of Energy

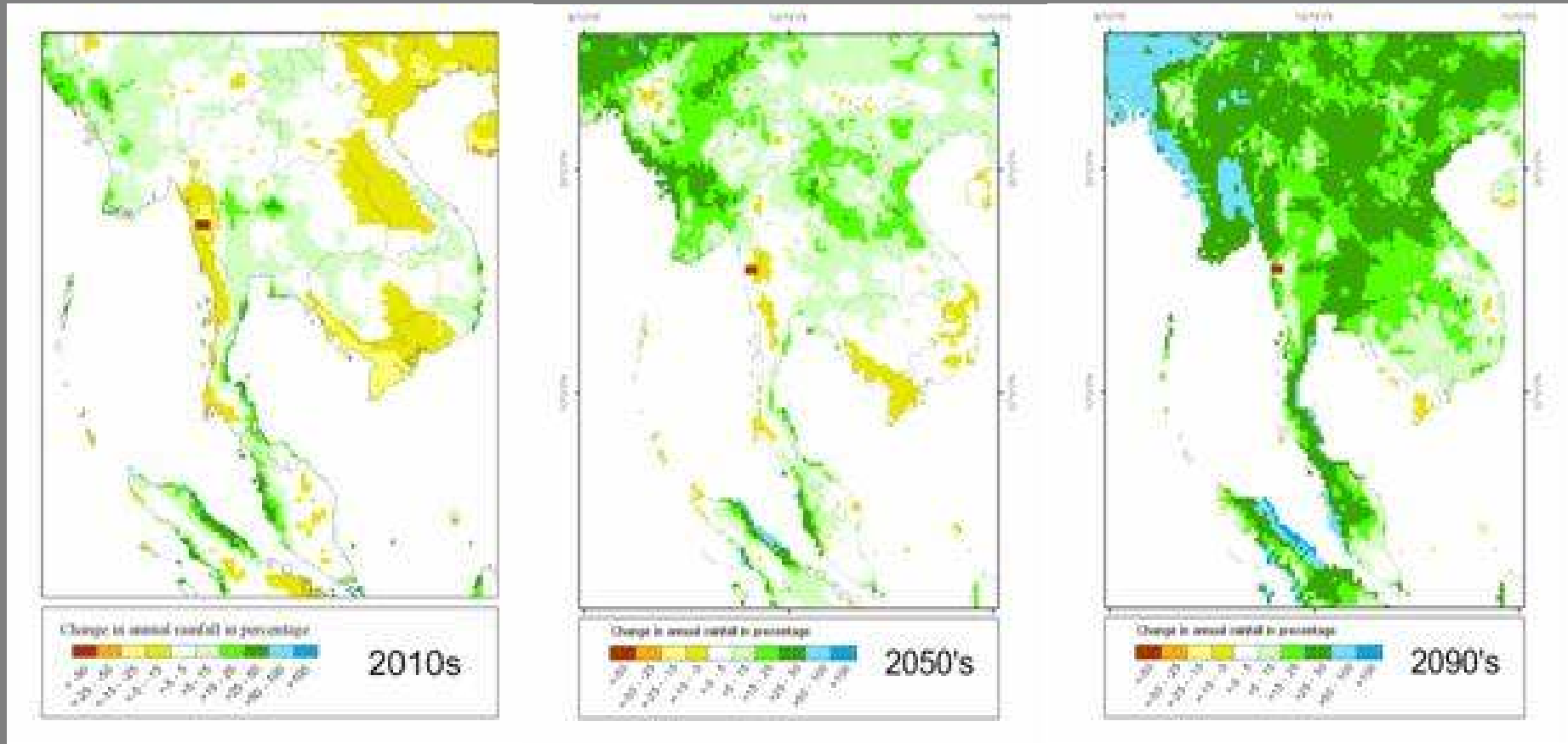


Temperature



Trend of future change in average maximum temperature in Southeast Asia

Rainfall

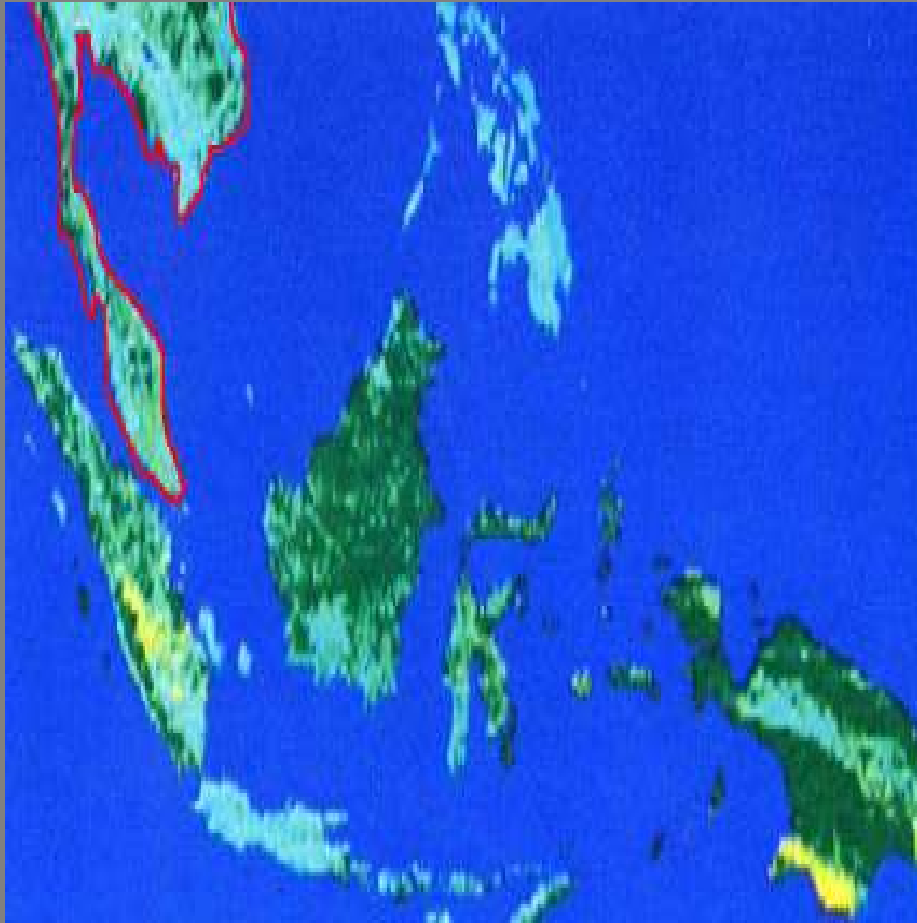


Trend of future change in annual precipitation in Southeast Asia

Sea Level

2007

Sea level rises 1.5-5.0 Meters



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Potential Impacts of Climate Change on Thailand



High poverty intensity
 Low-lying land areas
 High pop. density
 Long coastlines

Nature of the country

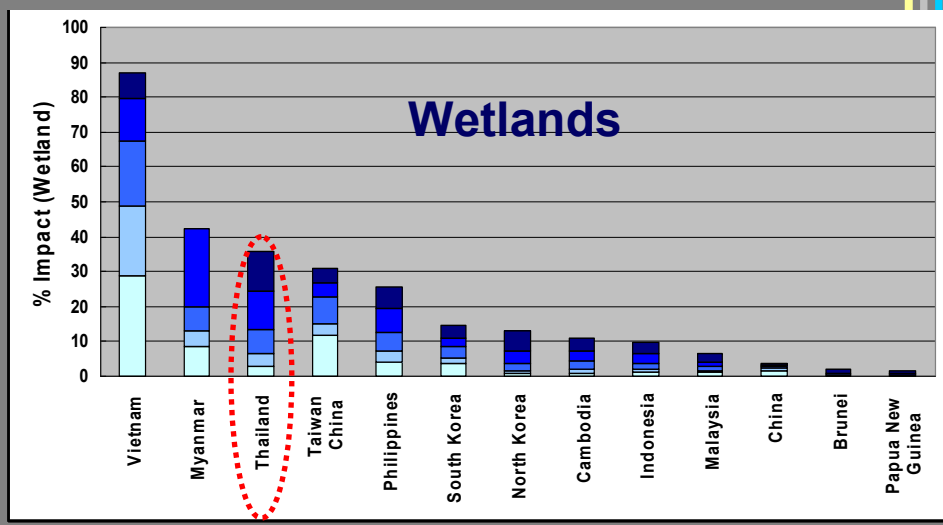
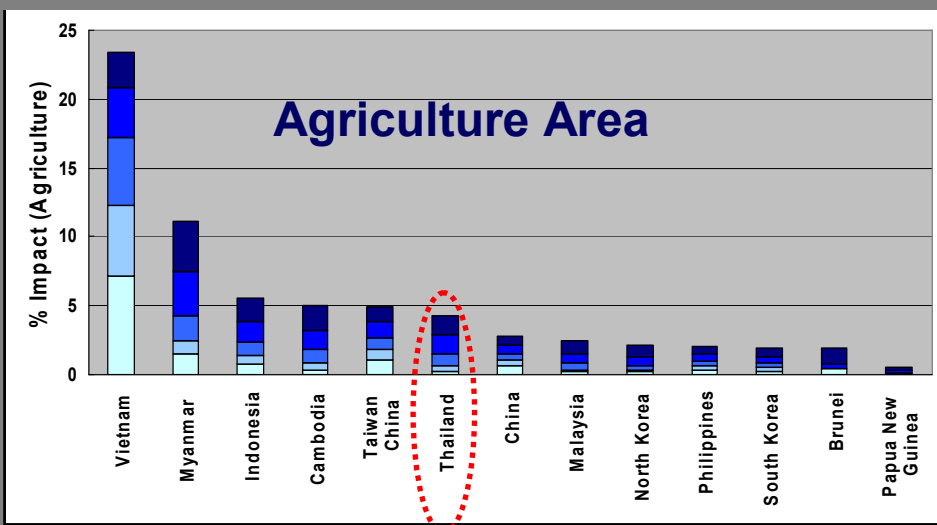
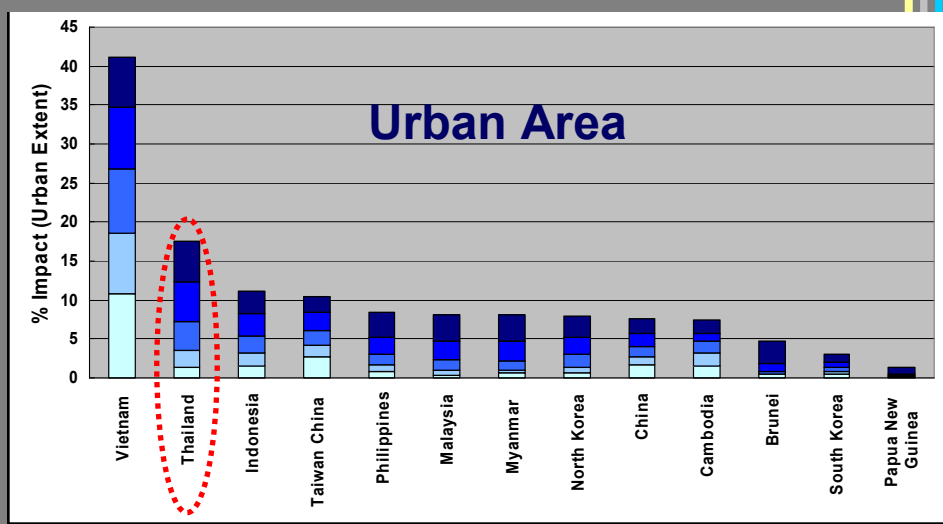
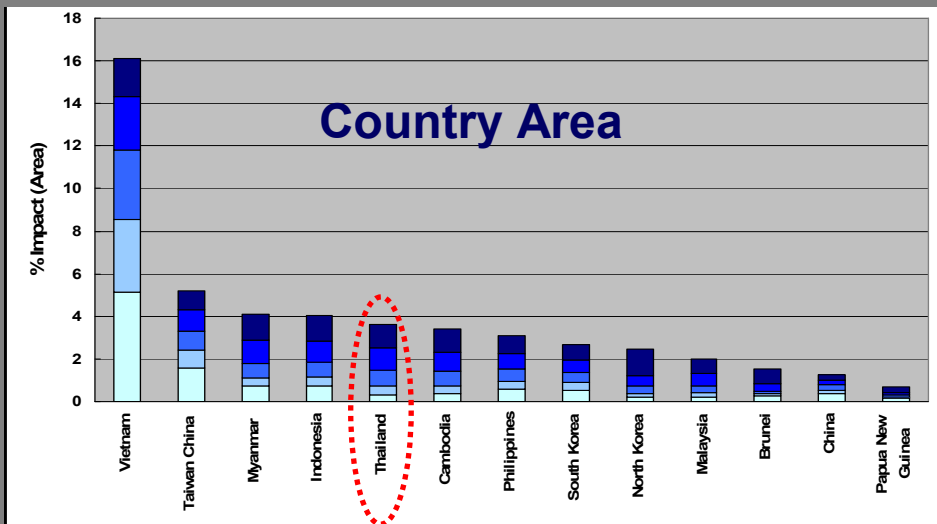
Rising energy use
 Deforestation
 Changes in land use

Causes of rising GHGs

- Major sources of GHGs in Thailand: power generation, transportation, and forestry sectors
- To lower the adverse consequences of climate change: promoting energy efficiency, GHG mitigation programs (changing building codes, reforestation projects, energy audits for industrial motors, and the use of mineral fertilizers)
- Sectors affected: agriculture, food and beverage, manufacturing, power generation, transportation, oil and gas, tourism, and electronics manufacturing.



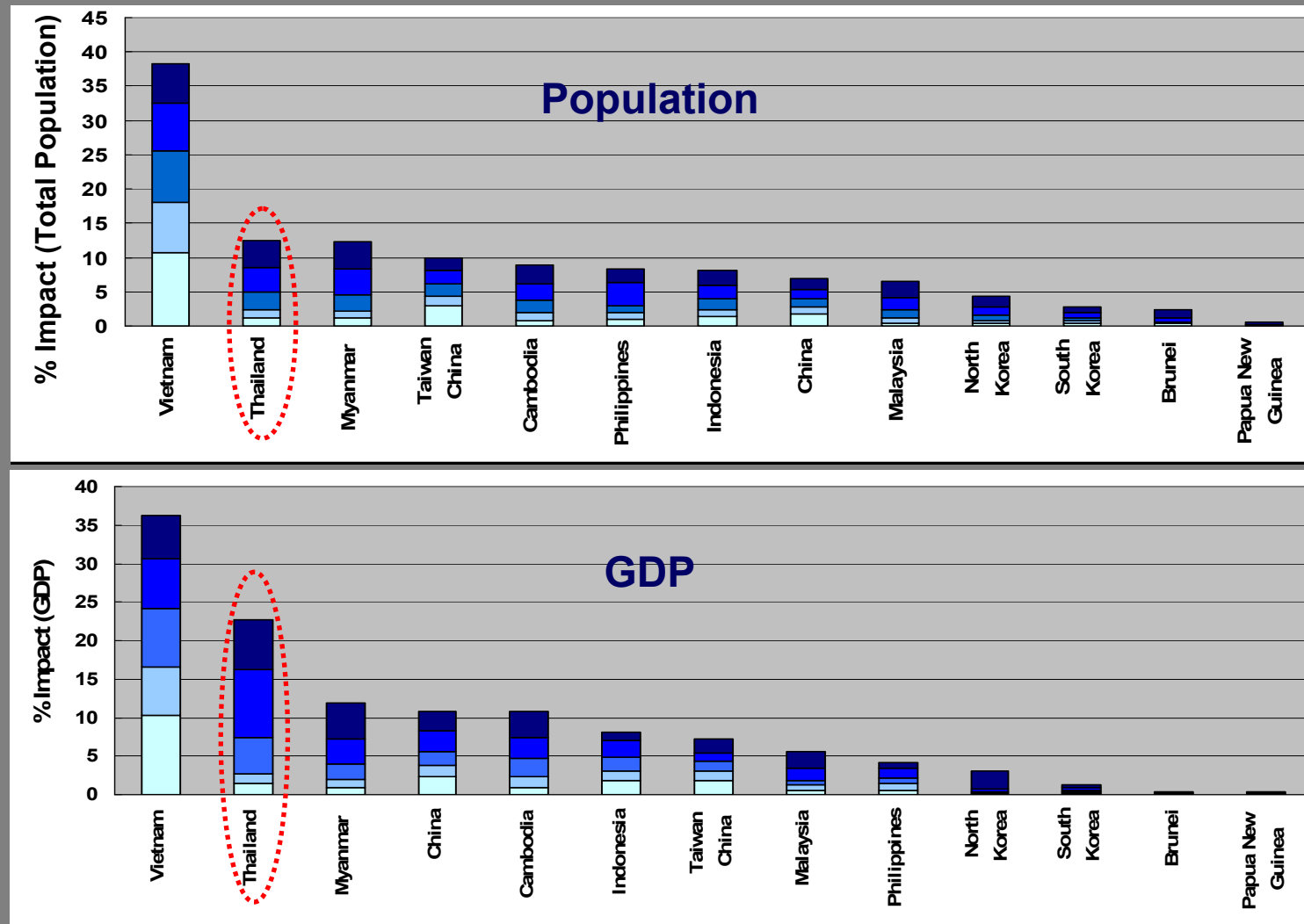
Potential Impacts on Thailand: Area



Source : Development Research Group, World Bank

1 meter 2 meter 3 meter 4 meter 5 meter

Potential Impacts on Thailand: Population and GDP



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Key Catastrophe Risk Factors in Thailand



Drought

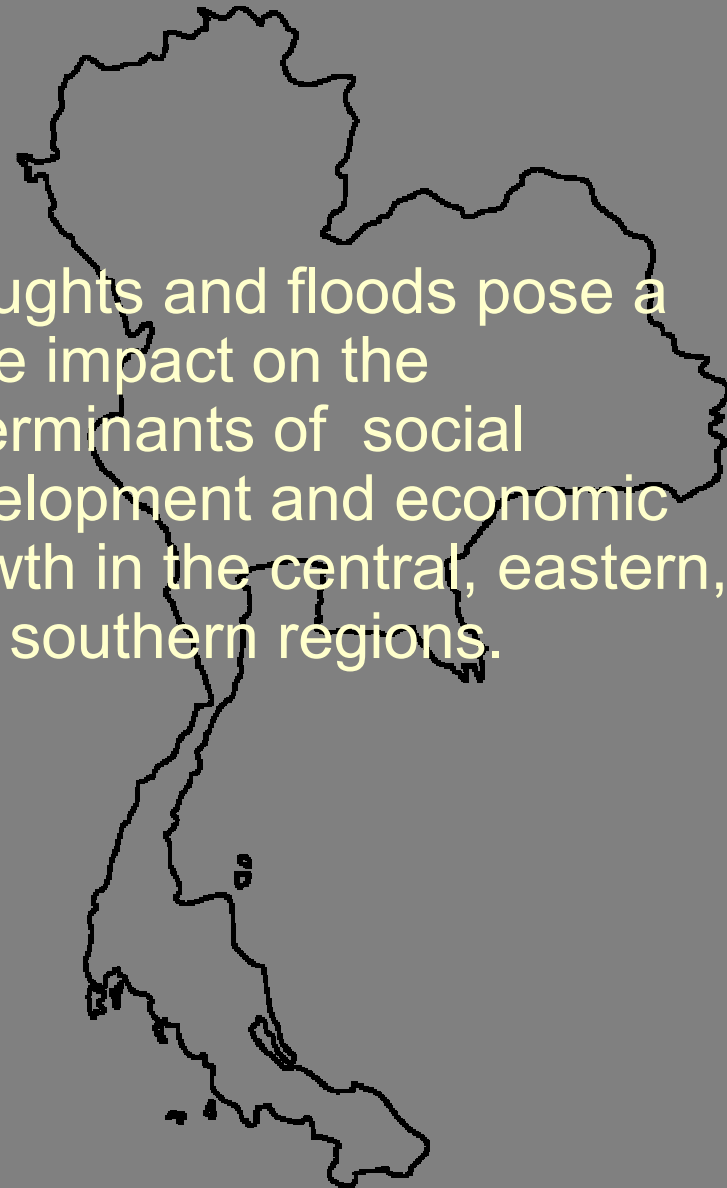


Flood



Cyclone

Droughts and floods pose a huge impact on the determinants of social development and economic growth in the central, eastern, and southern regions.



Summary of Natural Disasters in Thailand (2000-2009)

		No. of Events	No. of Killed	No. of Total Affected	Damage (000 US\$)
Drought	Drought	3	-	15,000,000	422,300
Earthquake	Tsunami	1	8,345	67,007	1,000,000
Epidemic	Bacterial Infectious Diseases	1	89	1,946	-
	Viral Infectious Diseases	3	23	19	-
Flood	Unspecified	4	49	2,512,500	51,050
	Flash flood	13	612	5,633,478	199,571
	General flood	13	283	4,673,097	405,940
Mass movement wet	Landslide	2	38	33,110	-
Storm	Unspecified	3	13	6,700	246
	Local Storm	3	1	35,204	2,000
	Tropical cyclone	5	13	48,219	20,000
Wildfire	Forest fire	1	-	-	-

Source: "EM-DAT: The OFDA/CRED International Disaster Database, www.emdat.be – Université catholique de Louvain - Brussels - Belgium"

Thai Fiscal Obligations following Natural Catastrophe (2005–2009)

Fiscal Year	Budget	Damage†
2009	66,058	38,078*
2008	65,767	n/a
2007	58,738	n/a
2006	64,276	25,000
2005	41,992	638,000

Note: † economic damage costs of top 10 natural disasters (calendar year basis)

Unit: 000 US\$

* Thai government real spending for the first nine months of fiscal year 2009

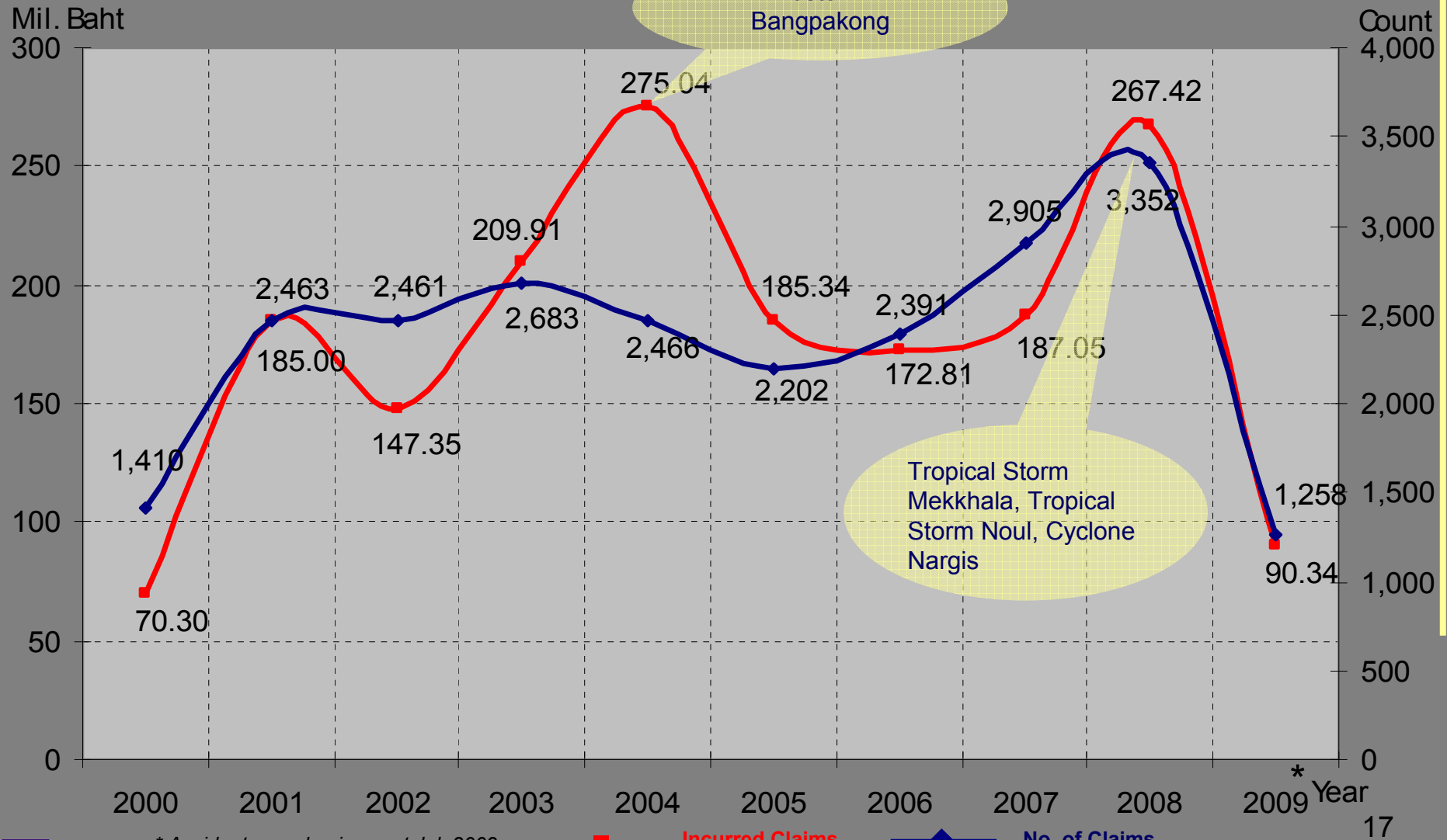
Source: Bureau of the Budget; Ministry of Finance, Thailand; "EM-DAT: The OFDA/CRED International Disaster Database, www.emdat.be – Université catholique de Louvain - Brussels - Belgium"

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Incurred Claims: Storm



* Accident year basis as at Jul. 2009

Source: Thai Re

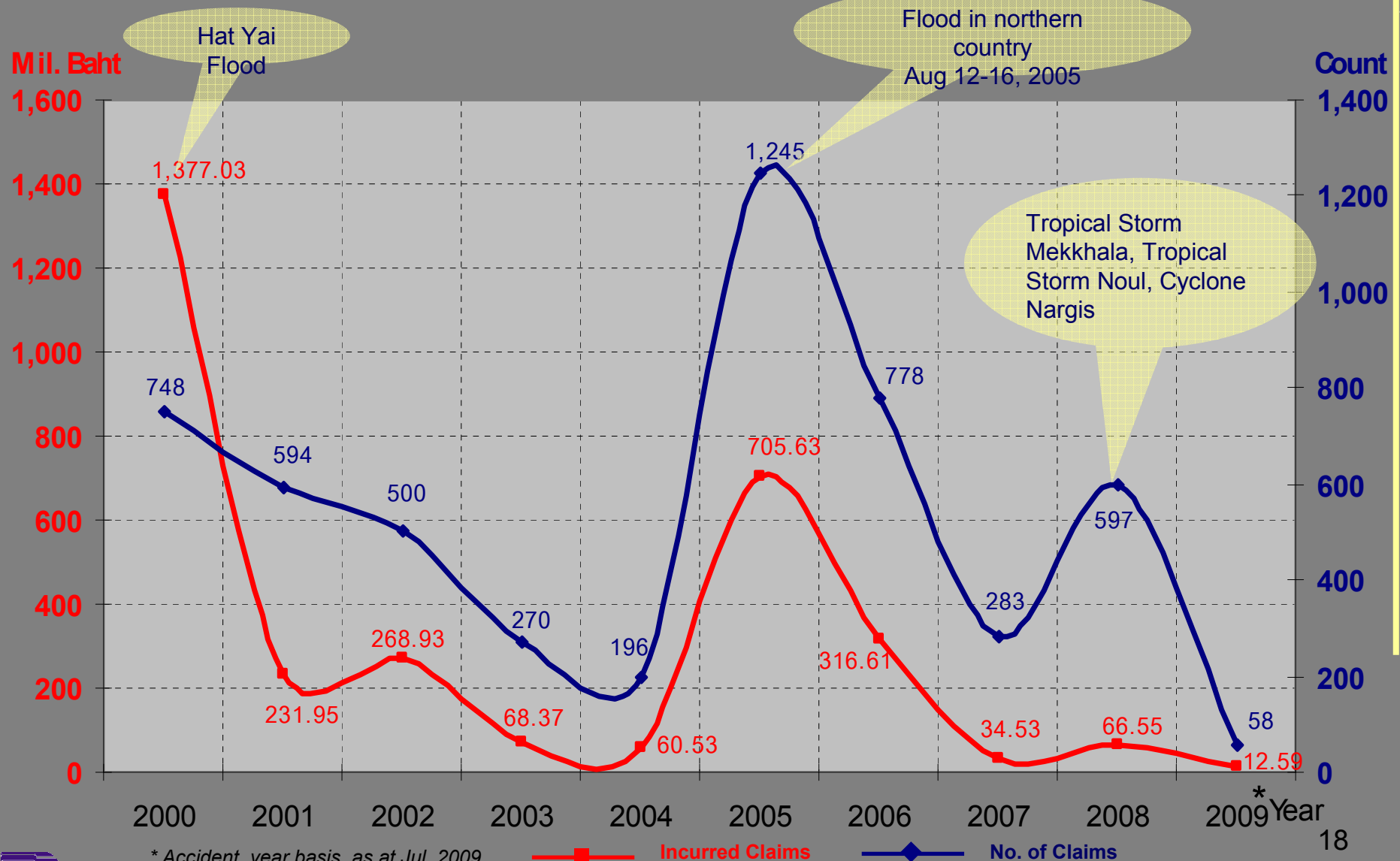


—■— Incurred Claims

—◆— No. of Claims

17

Incurring Claims: Flood



* Accident year basis as at Jul. 2009

Source: Thai Re



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Example of What Could be Done: A Hand Calculation

Example Thailand (Flooding)

- **Objective:** To provide flood coverage for all landed residential policy holders.
- **Some backgrounds** (based on Thai Re's Database):
 - Current # of policies – 1.2 mil./yr
 - Current S/I – 1.5 trillion baht (\$44,118 mil.)
 - Current Premium – 2,667 mil. baht (\$78 mil.)
 - Current tariff – 0.01% - 0.10%

Funding Model: A Hand Calculation

PML

1% of S/I = \$441 mil.



Policyholders

loss payout*
~ \$31 mil.



avg. prem.
0.1% of S/I
~ \$44 mil.



\$235 mil.
cat bond

\$176 mil.
R/I

\$15 mil.
committed credit line

\$15 mil.
ins. ind.

\$8.3
(\$9.2)
mil.

Operating Expenses

1%

\$4.1 mil

+

4%

\$0.6 mil

+

20%

\$7.0 mil

\$11.7 mil

Assumption

*Loss payout is determined based on average annual flood claim incurred over the last 10 years, which is expected to represent roughly 1/3 of all landed residential property policies.

R&D
Mgmt..
Fee, etc..

+

\$1.2 mil + \$1.0 mil

One-time
setup cost



What Need to Be Done

- Research & data collection
 - Hazard model
 - Economic impact study
 - Exposure pricing model
 - Risk assessment methodology
- Rule & regulation issues
- Public & private sector awareness
 - accessible to insurance

