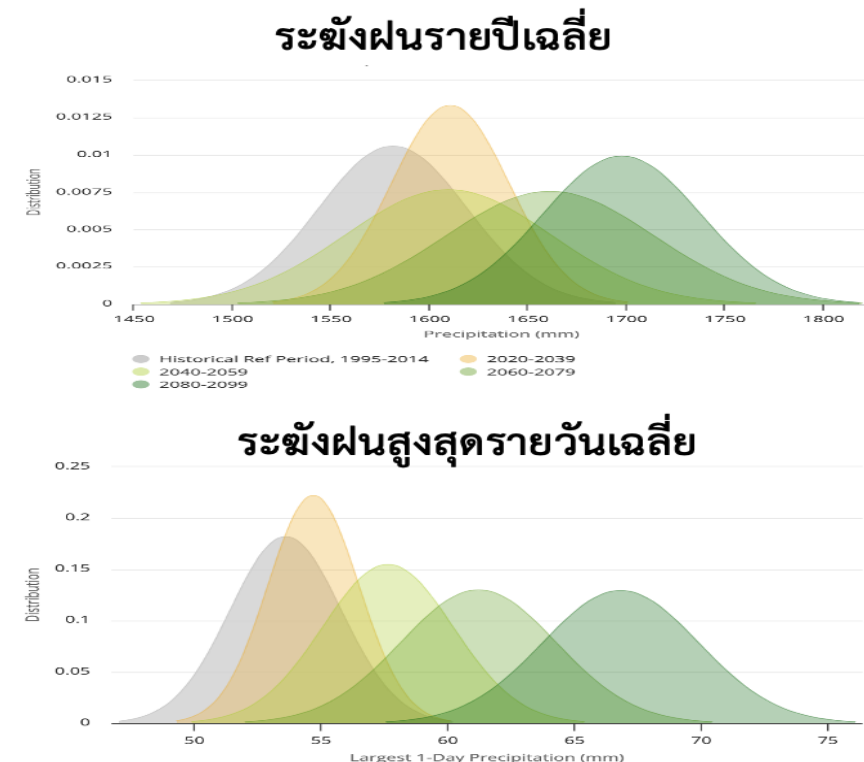
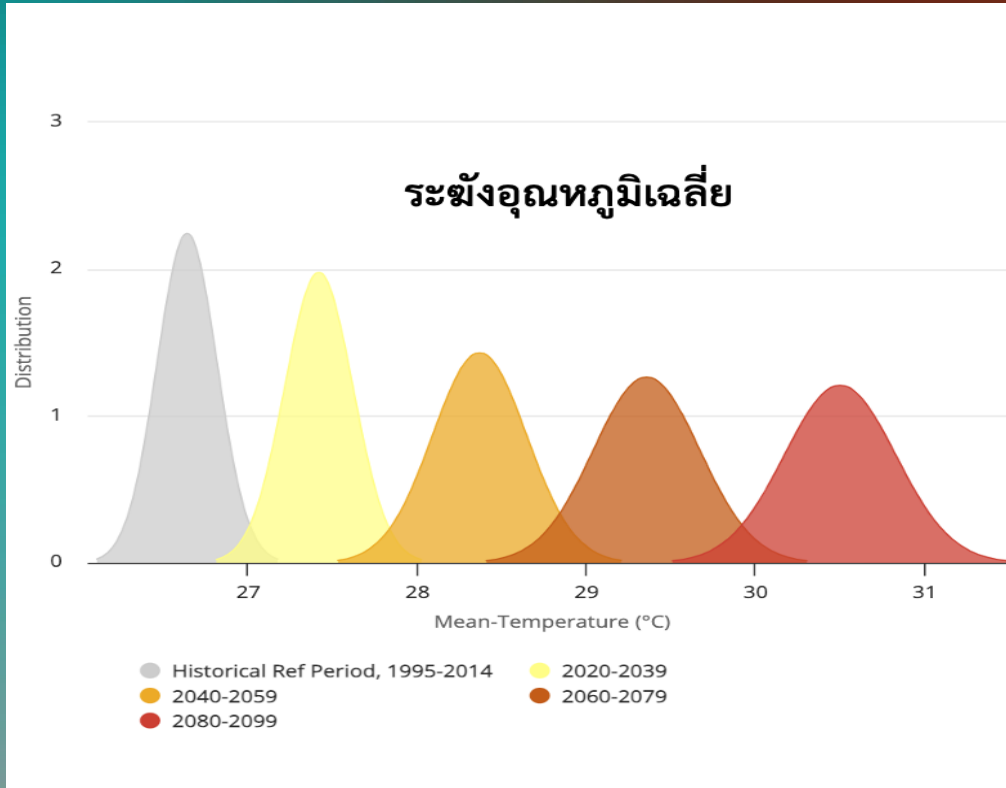


รศ. ดร. เสรี ศุภราทิตย์ D.Eng.

ผู้เชี่ยวชาญ IPCC (SREX, AR6)

ประธานกรรมการบริหาร Futuretales LAB, MQDC

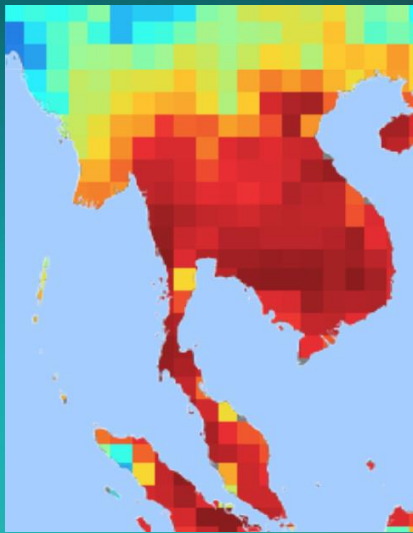
“ประเทศไทย Climate ไม่เหมือนเดิม”



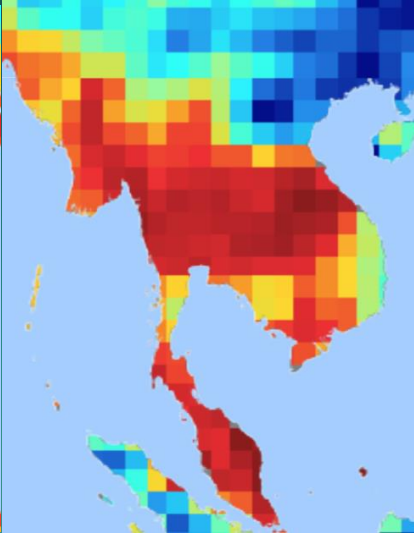
2567 : ปีที่ดัชนีภัยแล้งรุนแรงที่สุดประเทศไทย

(GDP ภาคการเกษตรด้านพืช -6.4%)

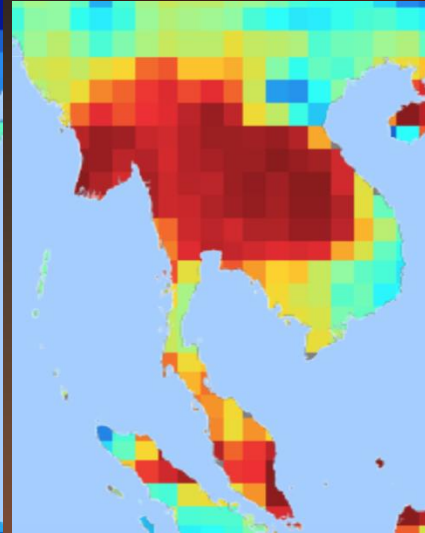
1998



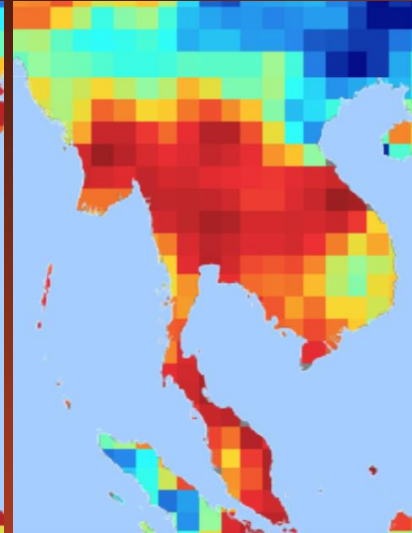
2016



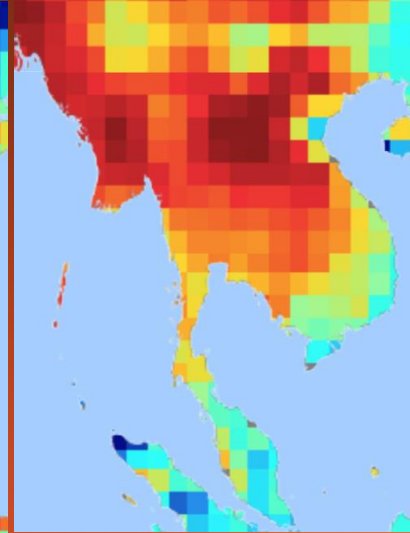
2019



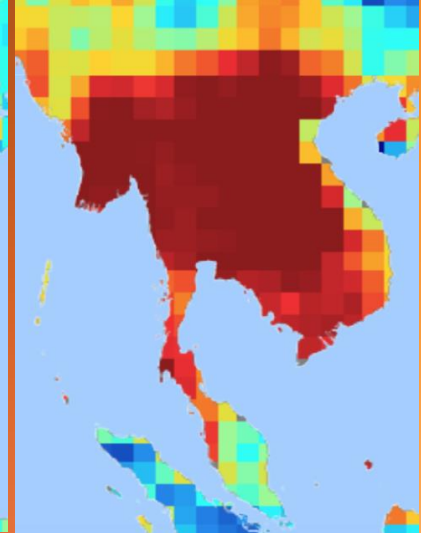
2020



2023



2024



SPEI-6 (April)

<-2.33 -1.65 -1.28 -0.84 0 0.84 1.28 1.65 >2.33

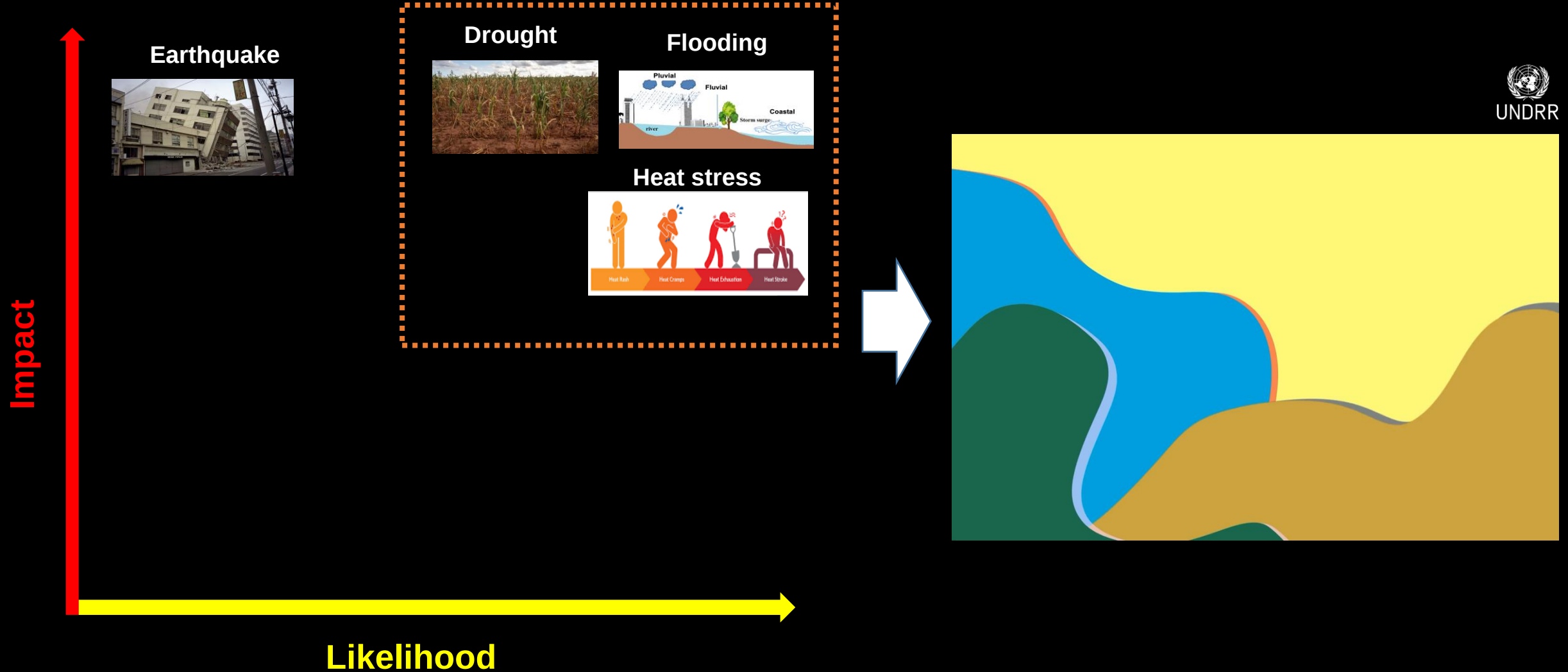
SPEI Global Drought Monitor



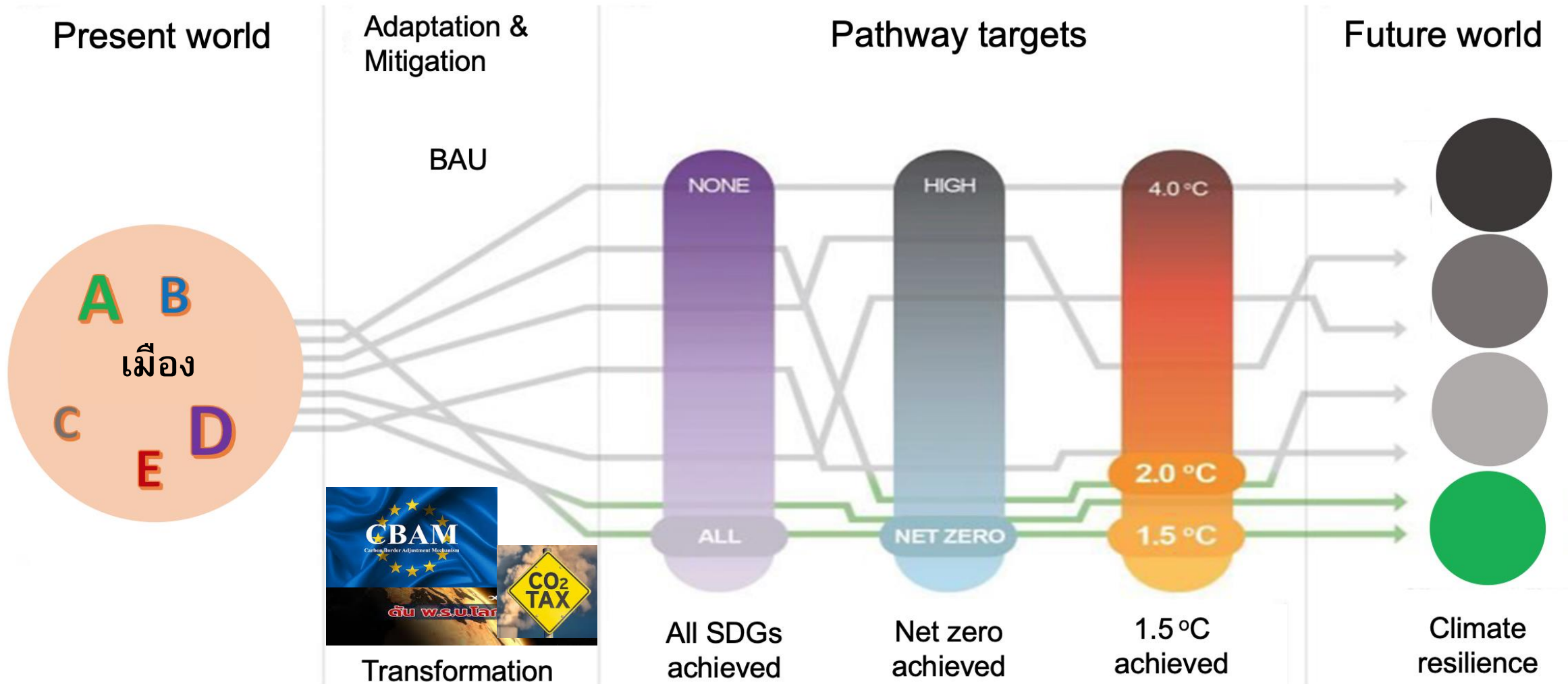
แรงขับเคลื่อนที่ต้องปรับเปลี่ยนประเทศไปสู่ “Climate Resilience”

- ✓ เหตุการณ์สภาพอากาศรุนแรงเกิดขึ้นทั่วภูมิภาค
- ✓ ไม่บรรลุเป้าหมาย Global resilient agenda (SDG, SDFRR, Paris 1.5°C)
- ✓ ความเสี่ยงทางการเงินจากการคาดการณ์สภาพอากาศรุนแรงโดย IPCC
- ✓ ความคาดหวังด้าน ESG จากผู้มีส่วนเกี่ยวข้อง
- ✓ กฎเกณฑ์ใหม่ด้าน ESG และสงครามการค้า
- ✓ นวัตกรรมใหม่ และความได้เปรียบในการแข่งขัน

Moving Eastern Thailand from Risk to Resilience



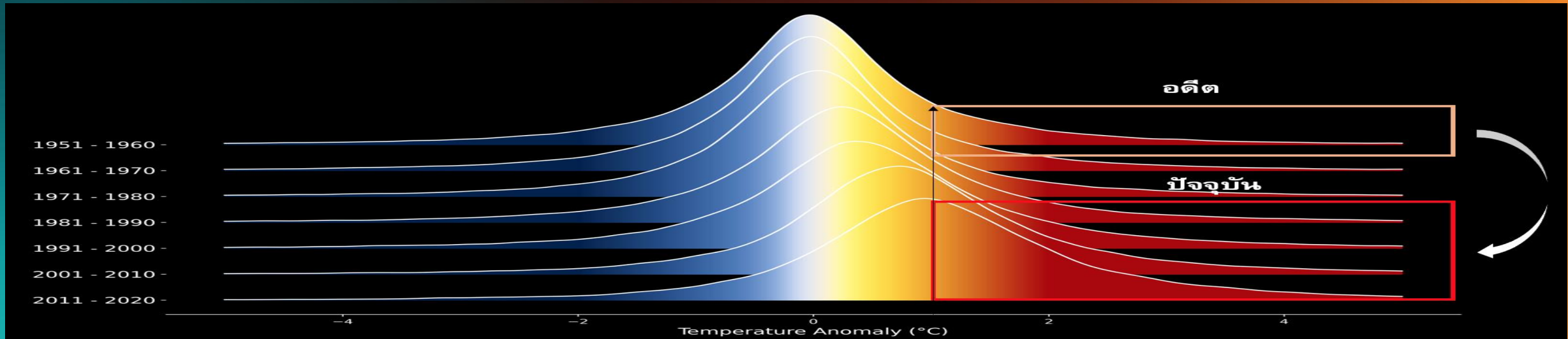
โอกาส : City Climate Resilience



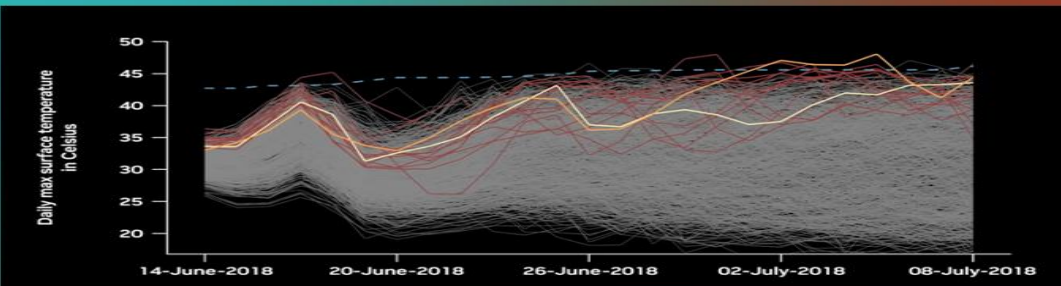
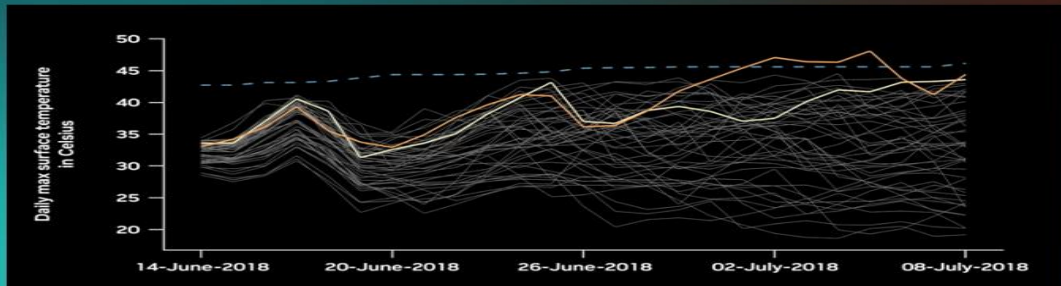
Source : IPCC (2023)

Equity and well-being for all

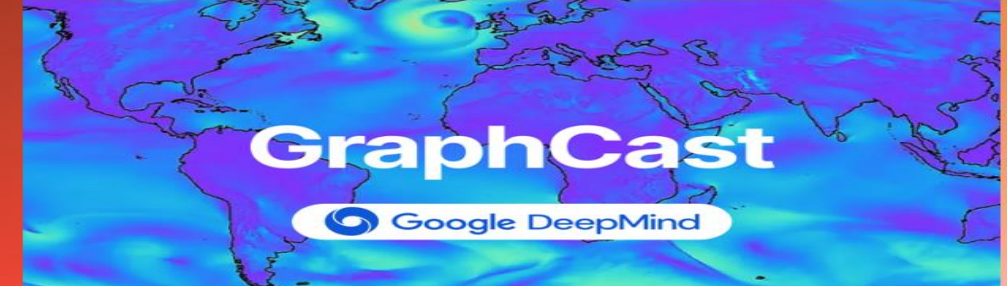
Global temperature anomaly : A small shift makes a big difference



FourCasNet, Nvidia

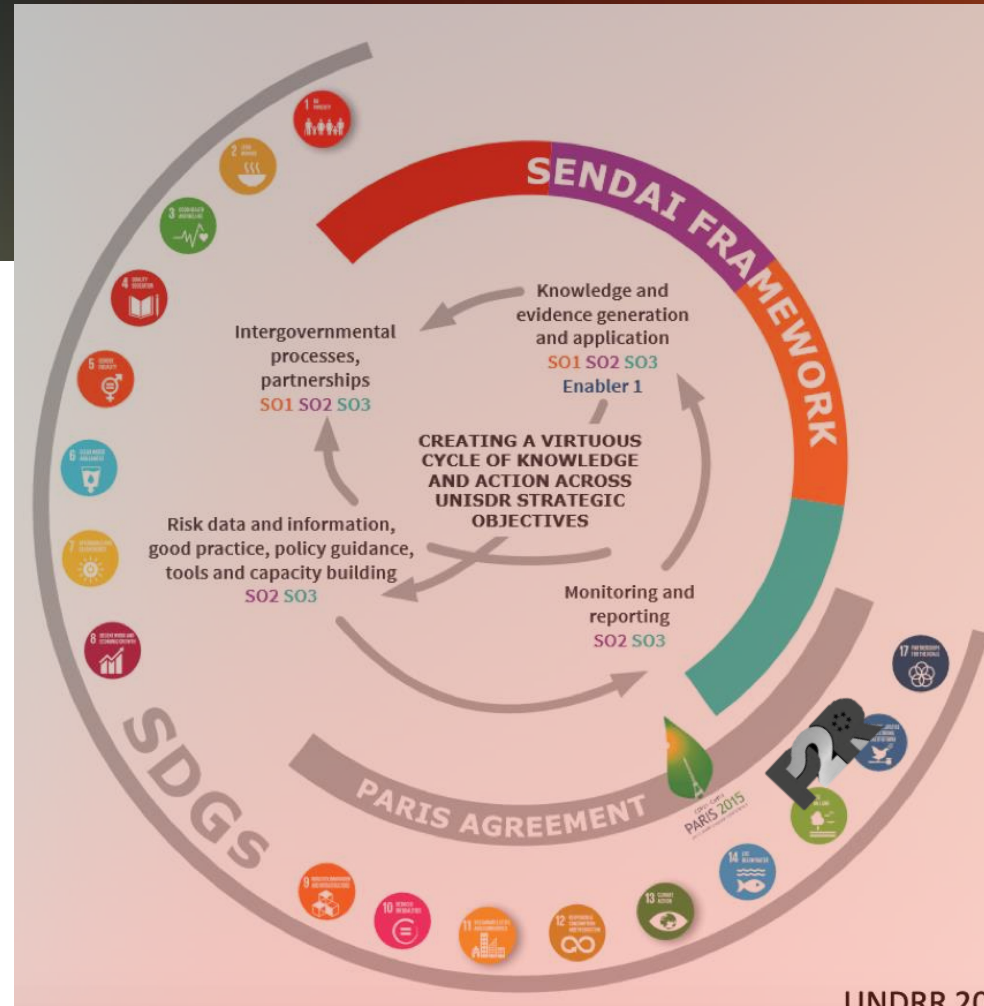


GraphCast, Google



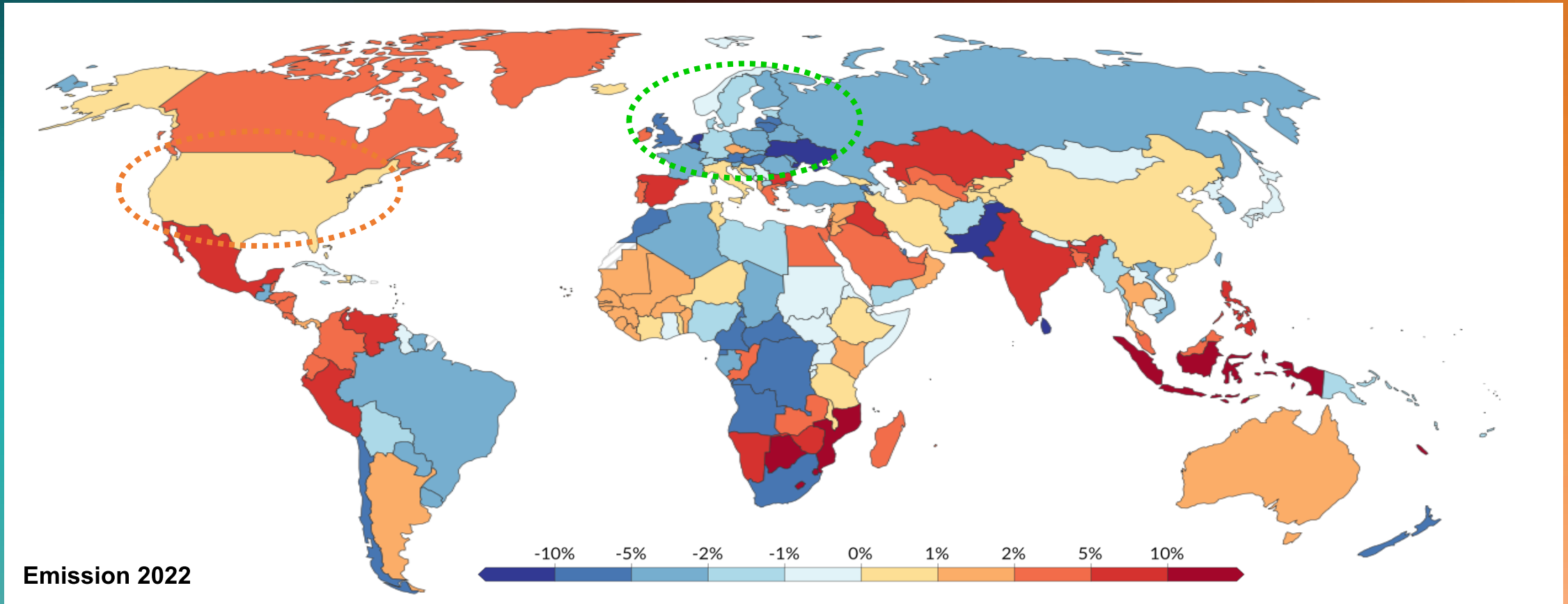
SDG2030 & Sendai Framework 2015-2030 & Paris Agreement 2015

15% progress



20% progress

Half and net-zero emissions in 2030 and 2050

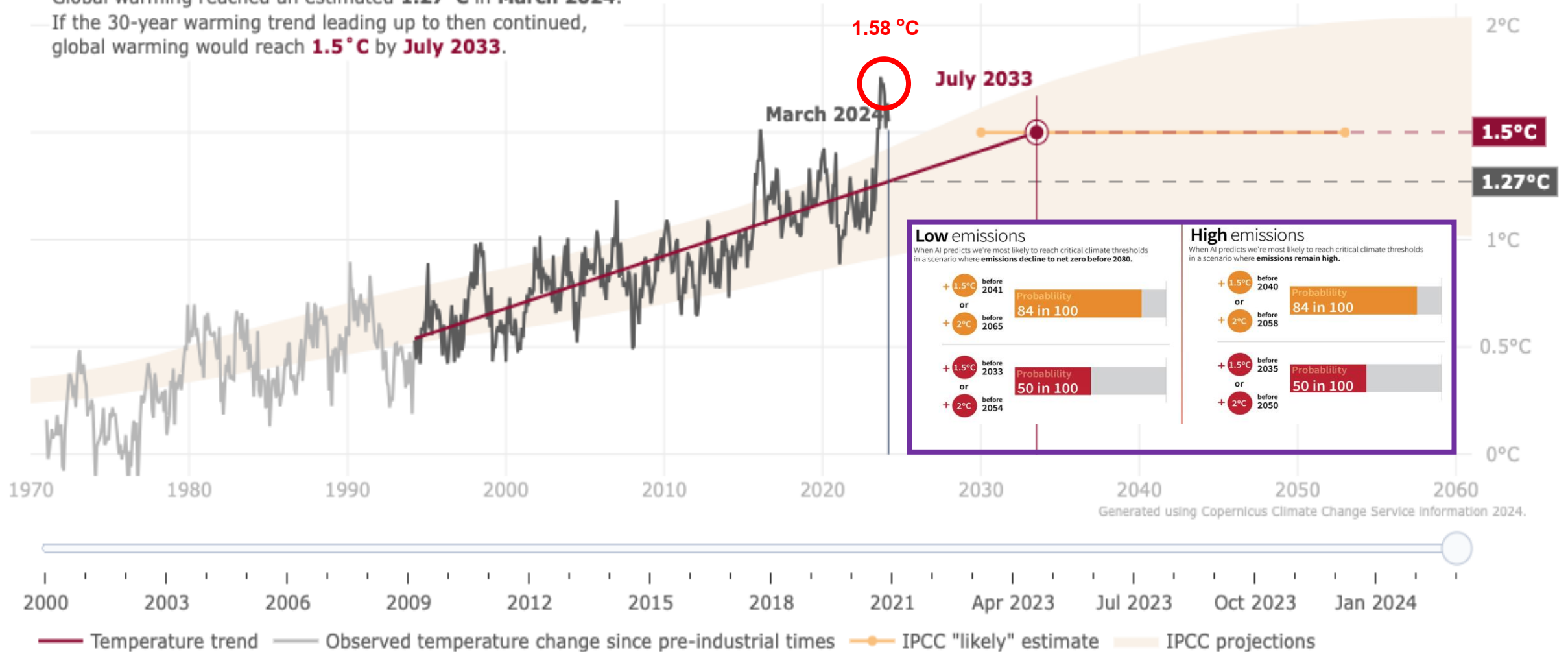


Geopolitical climate policy : EU parliament and US president elections

2033 : 1.5 °C warming limit (IPCC)

Global warming reached an estimated **1.27°C** in **March 2024**.

If the 30-year warming trend leading up to then continued, global warming would reach **1.5°C** by **July 2033**.



BELOW 1.5° BY 2025: THE PLAN



CLIMATE
PROMISE



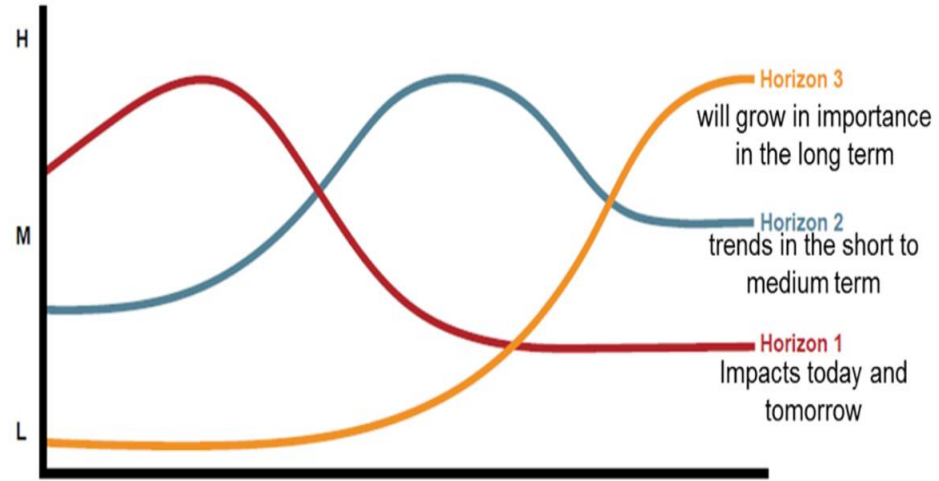
Ambition

Acceleration

Inclusivity



Business Climate Resilience : What your company should do ?



Is Climate Change important to Business Risk?

Physical assets, manufacturing techniques, operations, and maintenance?

Input raw material supplies, manpower, or product demand?

Utilities such as water and electricity, transportation, and other public and private infrastructure and services?

No

Cat. 3 Risk

Not essential to address climate change

Yes

Are there any significant financial outlays required to address the threat, a long implementation period, or a long-term investment or contract as part of the threat?

No

Cat. 2 Risk

Monitor and evaluate future risk

No

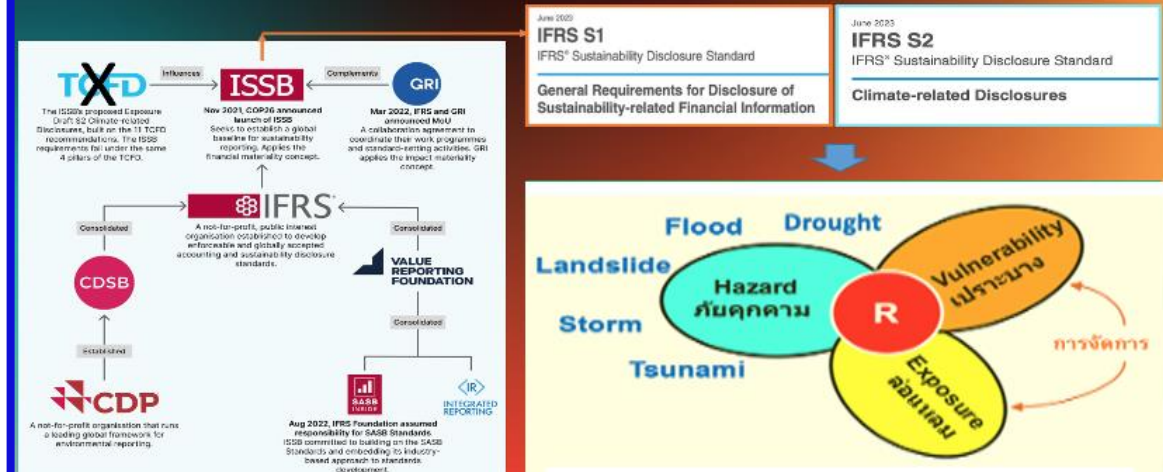
If the wrong choice is taken, is there a high value at stake?

Yes

Cat. 1 Risk

Act to thoroughly examine the risk and respond

Be ready for ISSB sustainability standard



Climate change risk taxonomy



- Failure to adapt to the physical impacts of climate change
- Failure to mitigate GHG emissions
- Failure to adapt investment strategies
- Failure to disclose climate-related risks
- Failure to comply with environmental regulatory obligations
- Failure to take climate commitments into account



“Climate Change Exposure and Bankruptcy Risk, Who’s next”

Firms ignoring climate crisis will go bankrupt, says Mark Carney



Bank of England governor warns of financial collapse linked to climate emergency

MarshMcLennan

PERSPECTIVE

CLIMATE CHANGE HAS CLAIMED ITS BIGGEST CORPORATE VICTIM

Now Banks Are on Alert



DECEMBER 2020 (REVISED SEPTEMBER 2023) CASE HBS CASE COLLECTION

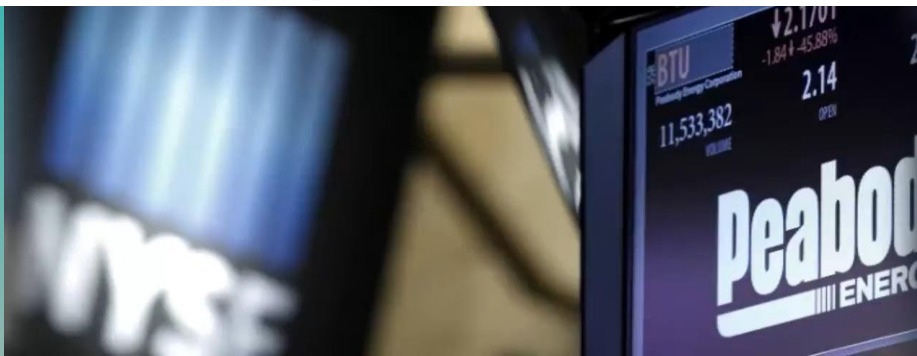
PG&E and the First Climate Change Bankruptcy

DIVE BRIEF

Indoor farming company AppHarvest files for bankruptcy



US coal major Peabody files for bankruptcy

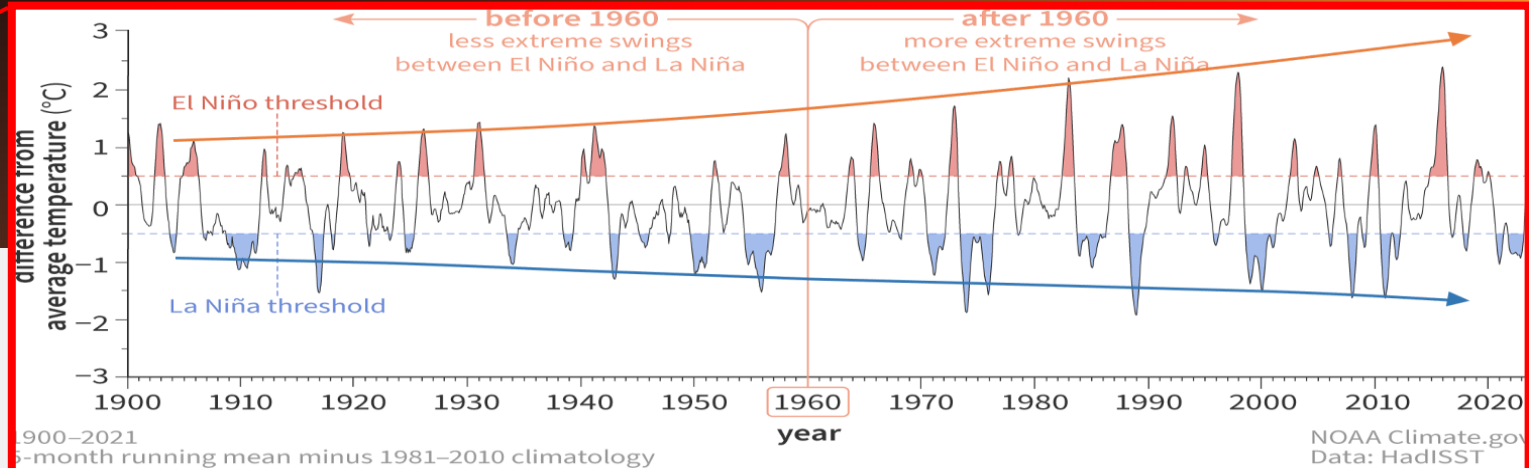
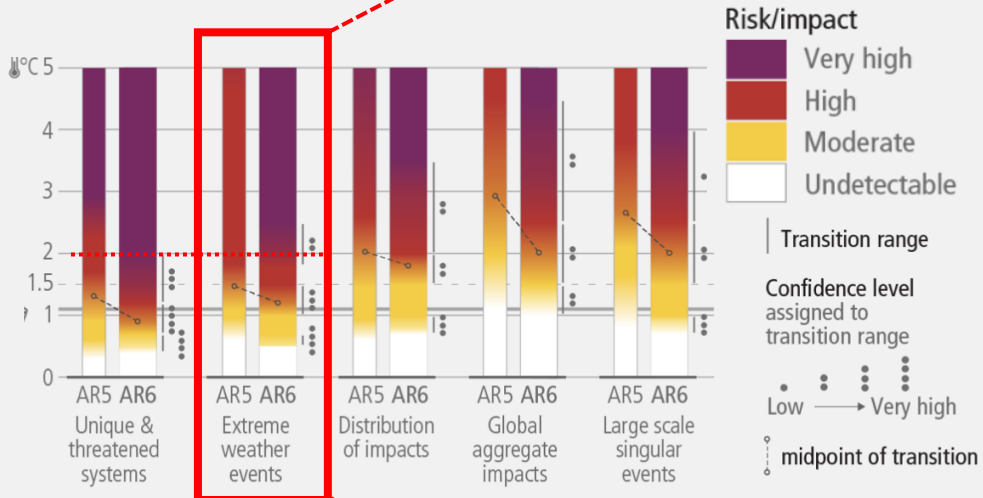


POWER RESTORATION FOR CUSTOMERS
Hawaiian Electric Industries F
Utility Bankruptcy Expert As C

BRIGHT TV

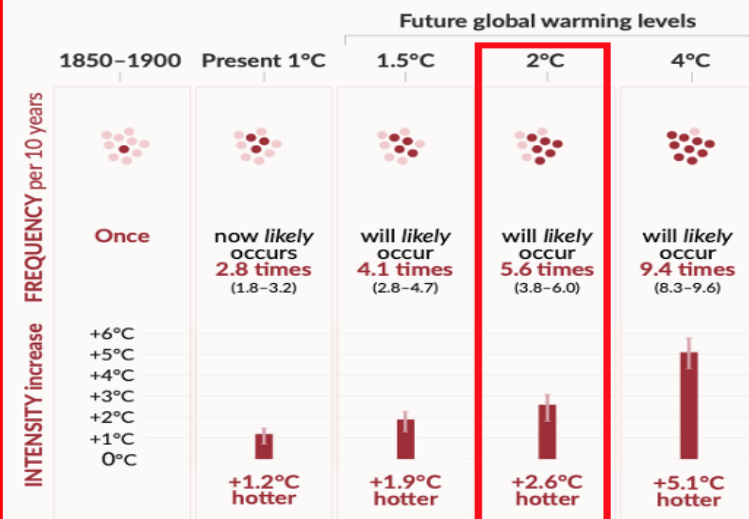


Risk/impact under 2 °C warming (IPCC 2022)



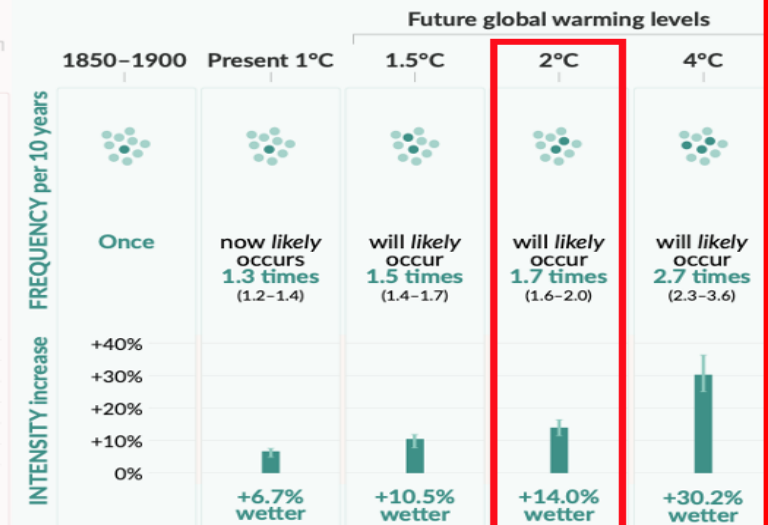
Drought (10-year event)

Frequency and increase in intensity of extreme temperature event that occurred once in 10 years on average in a climate without human influence

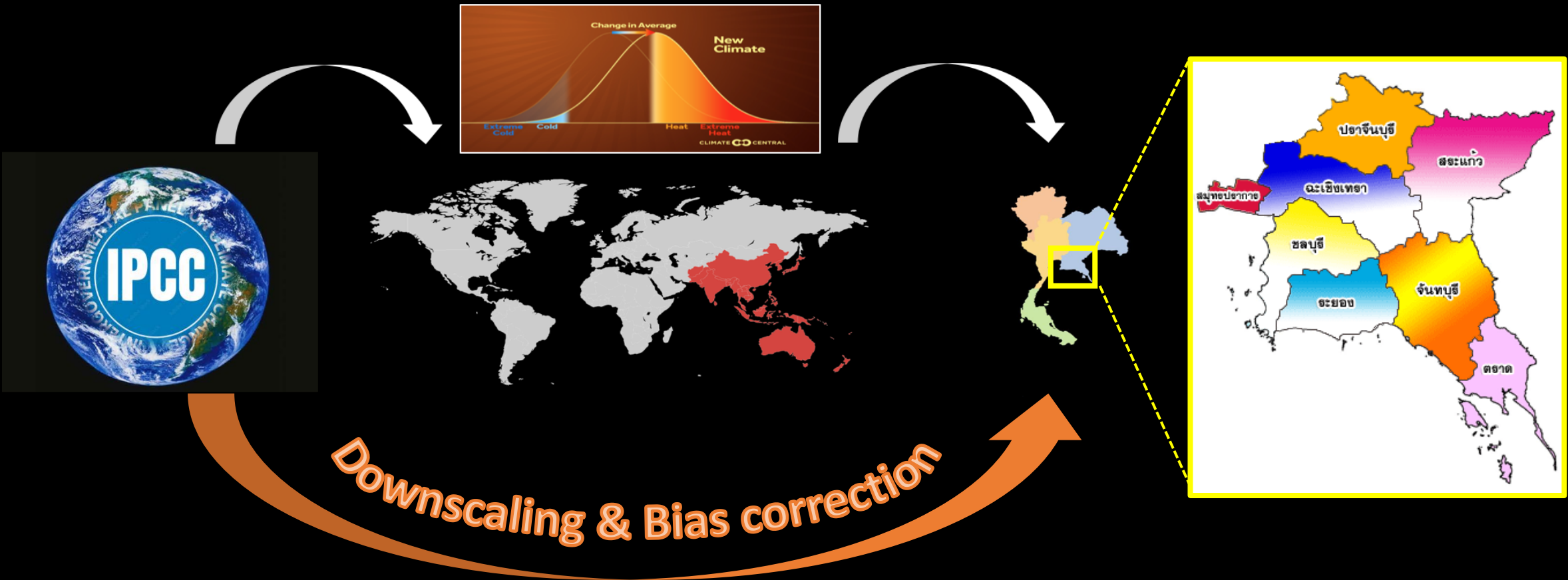


Flood (10-year event)

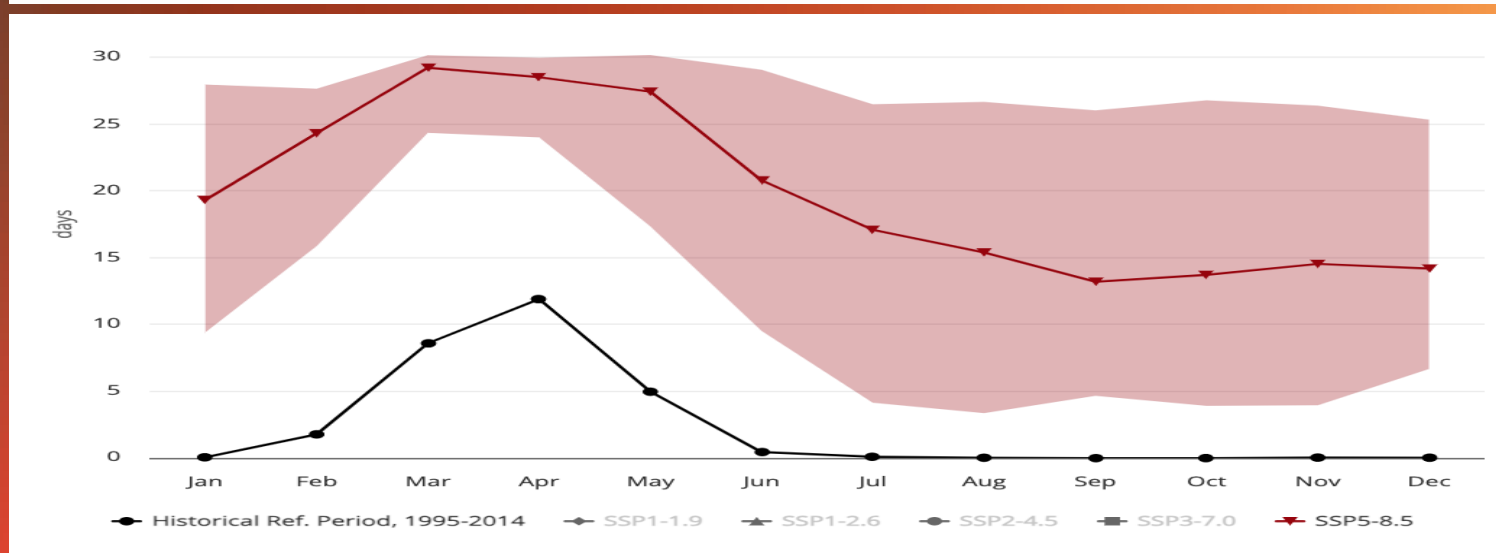
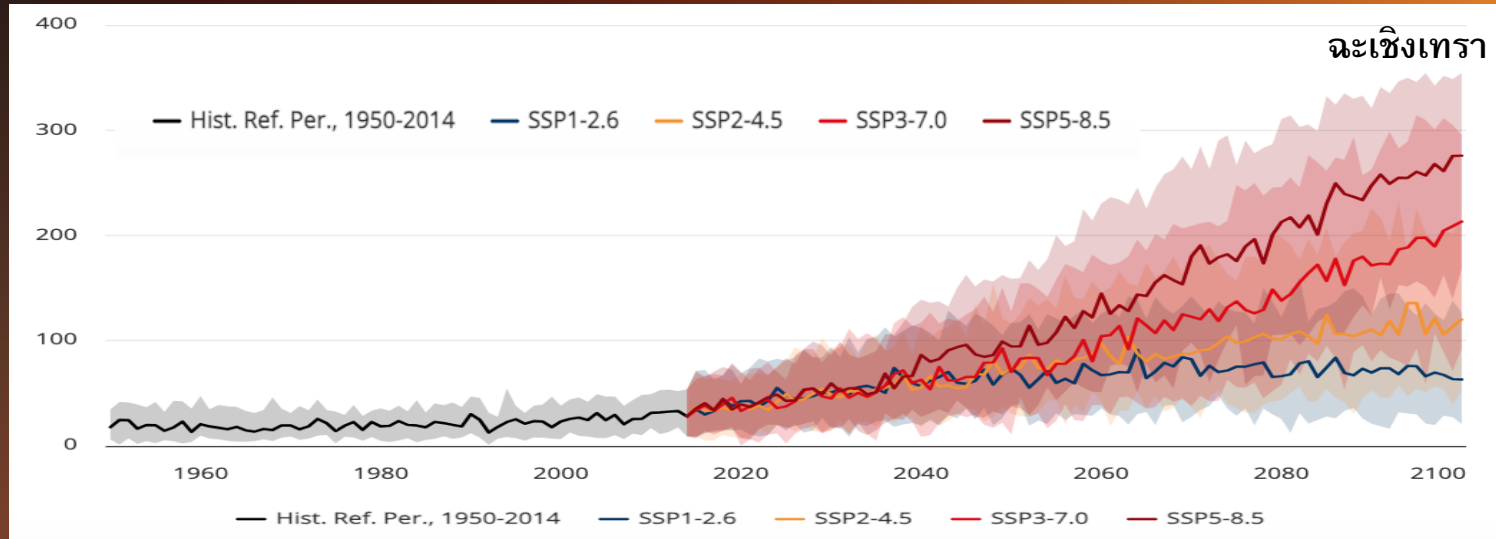
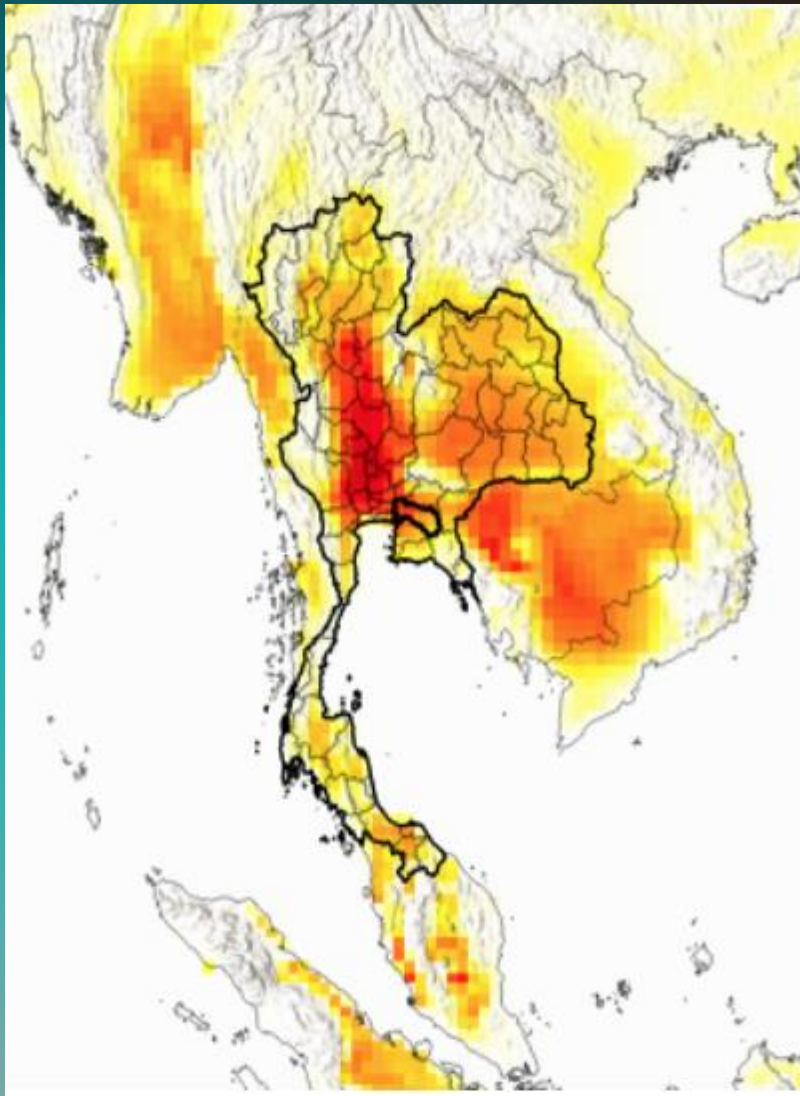
Frequency and increase in intensity of heavy 1-day precipitation event that occurred once in 10 years on average in a climate without human influence



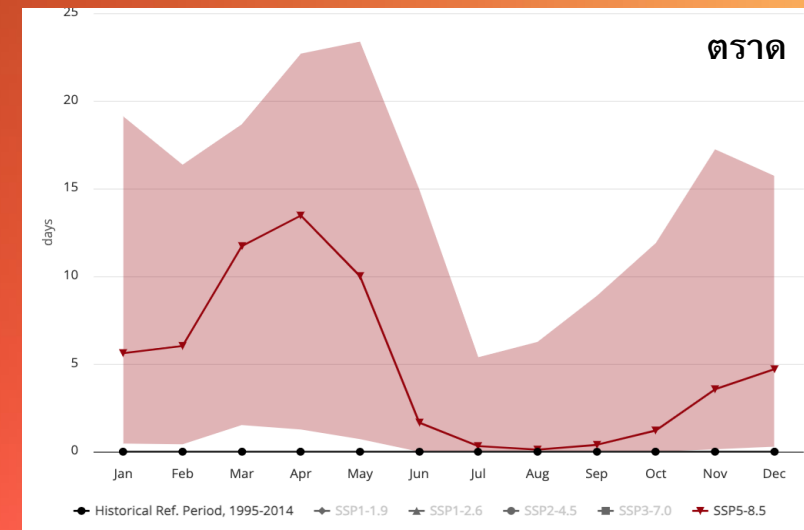
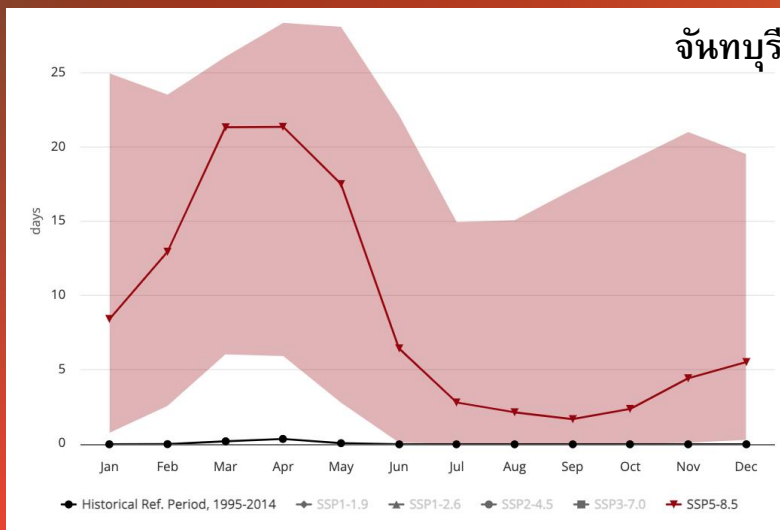
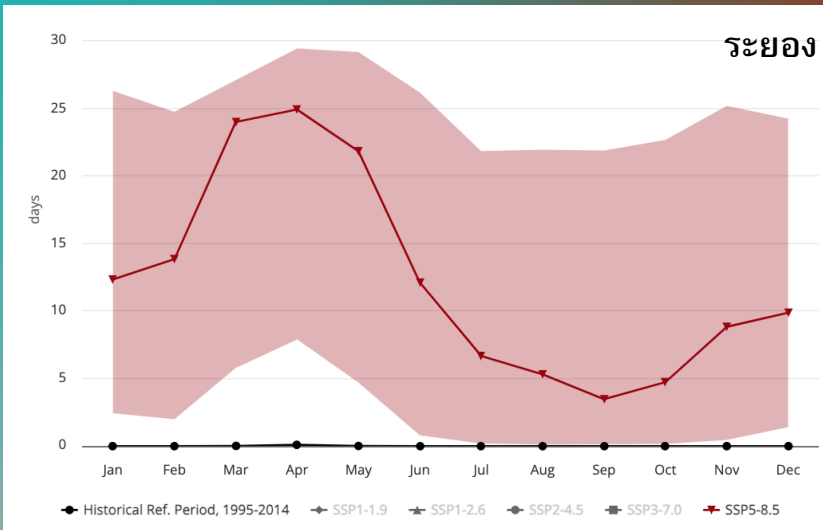
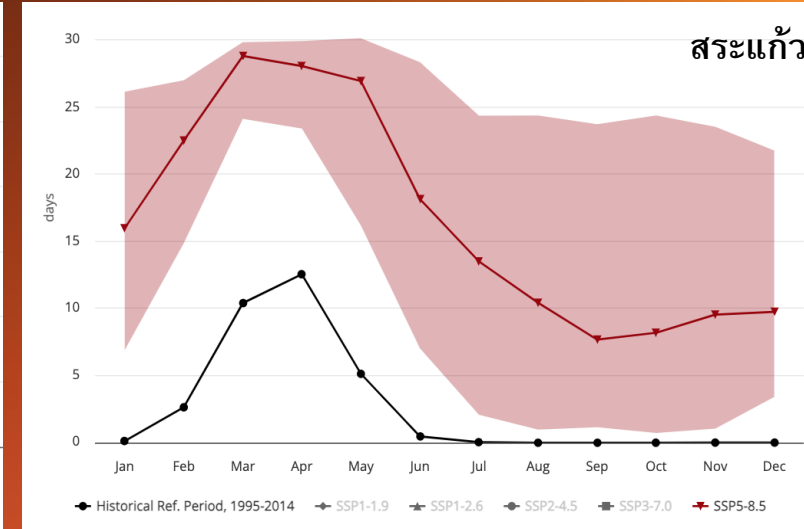
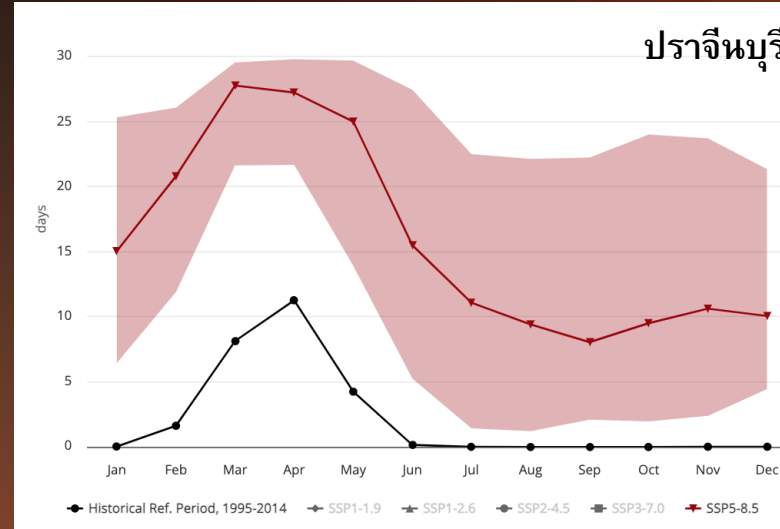
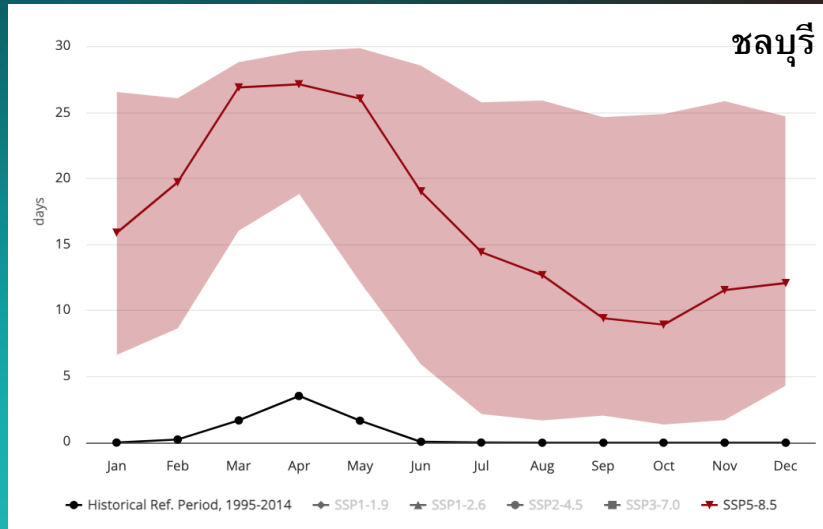
Climate Risk Assessment over Eastern Thailand



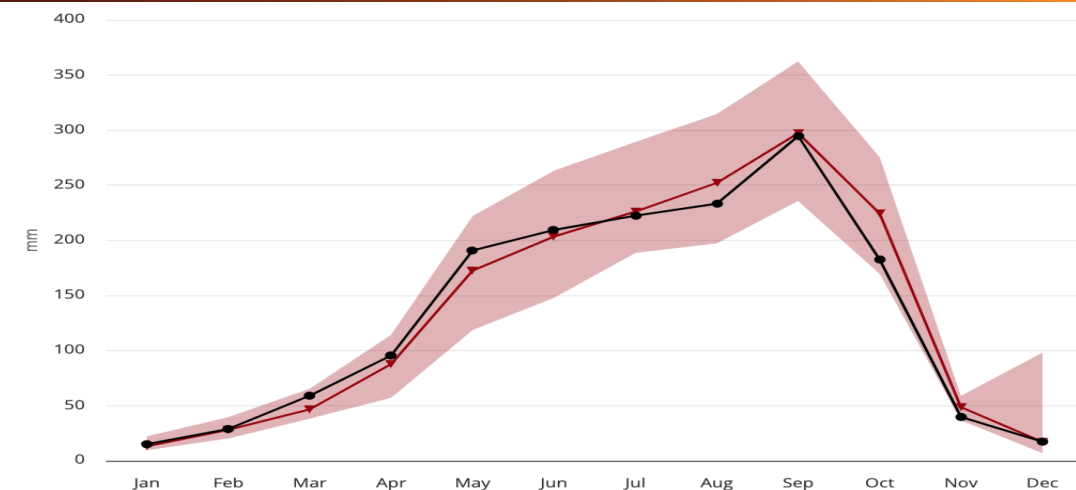
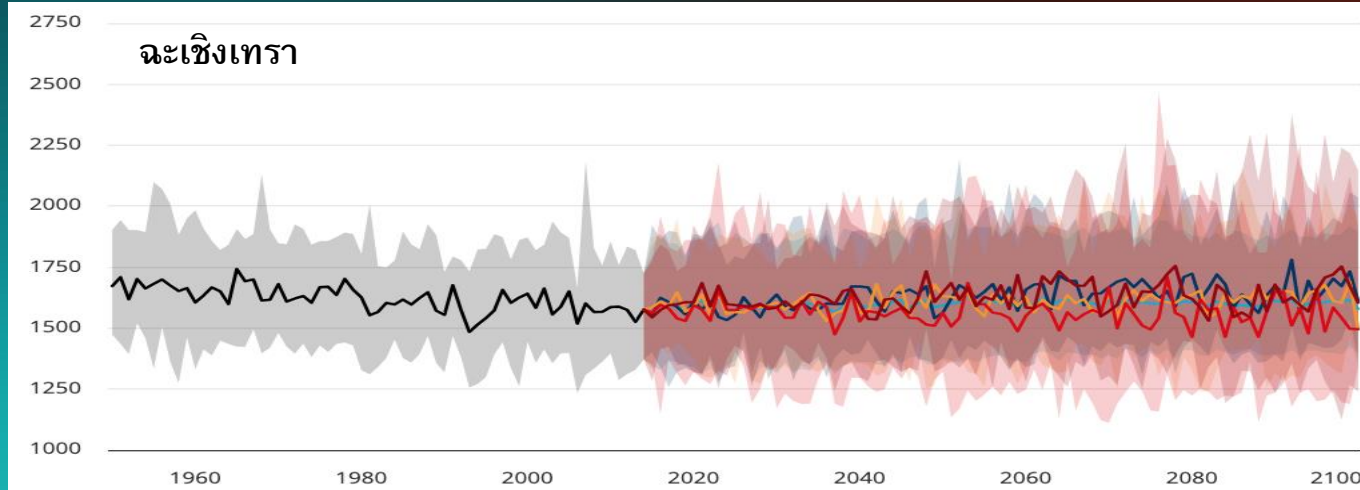
จำนวนวันที่มีอุณหภูมิสูงสุด > 35°C



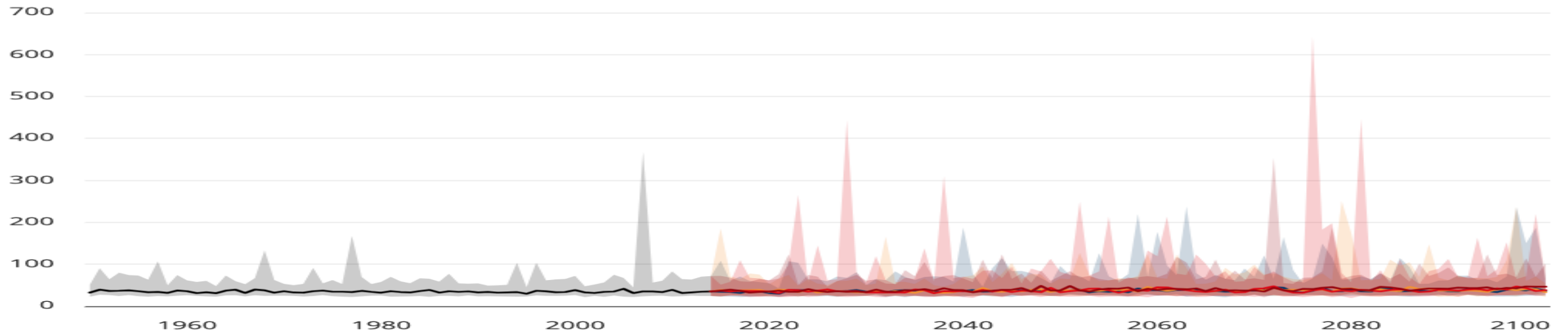
จำนวนวันที่มีอุณหภูมิสูงสุด > 35°C



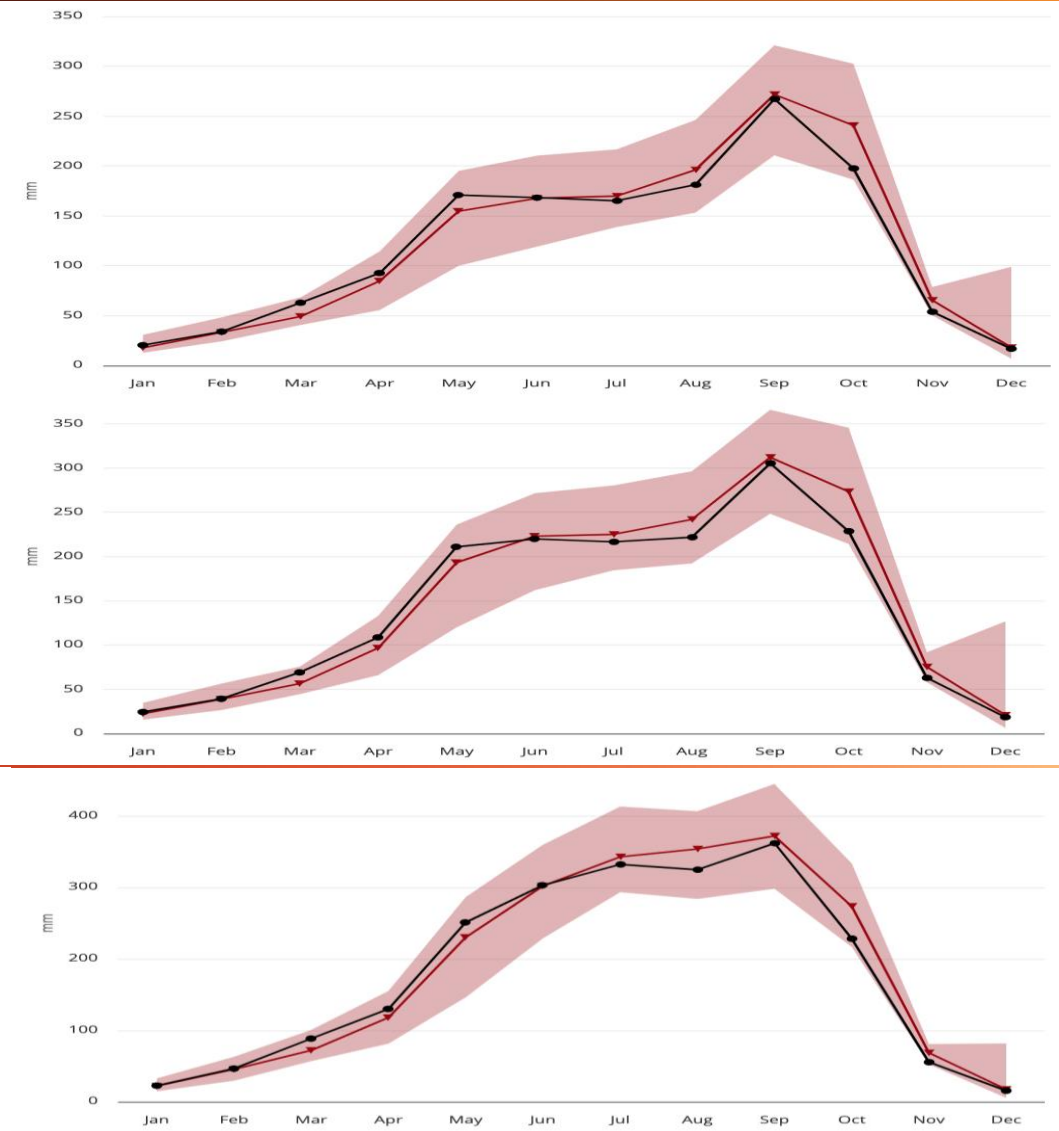
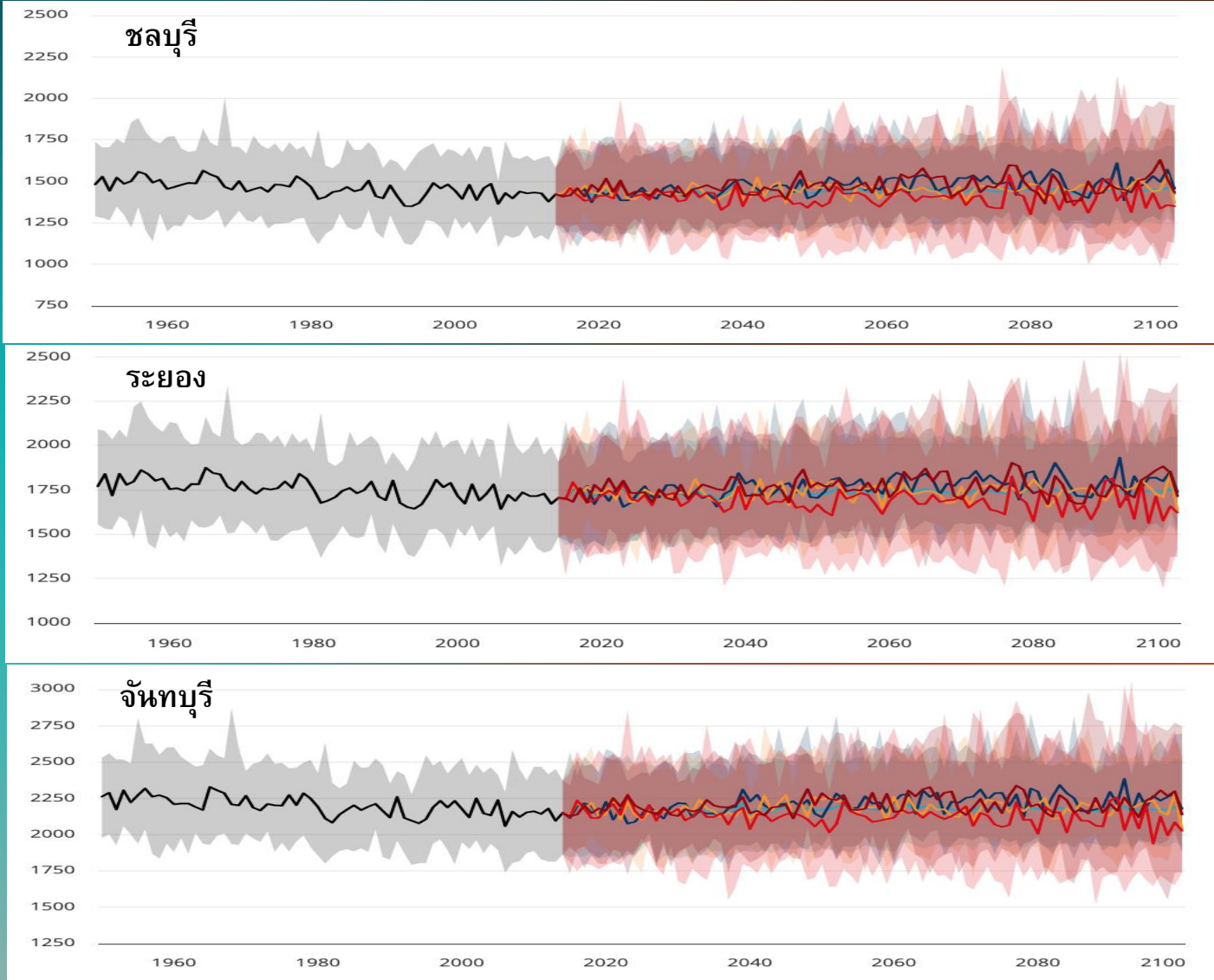
ปริมาณฝนรายวัน รายเดือน และรายปี



Projected Average Largest 1-Day Precipitation
Chachoengsao, Thailand; (Ref. Period: 1995-2014), Multi-Model Ensemble



ปริมาณฝนรายเดือน และรายปี



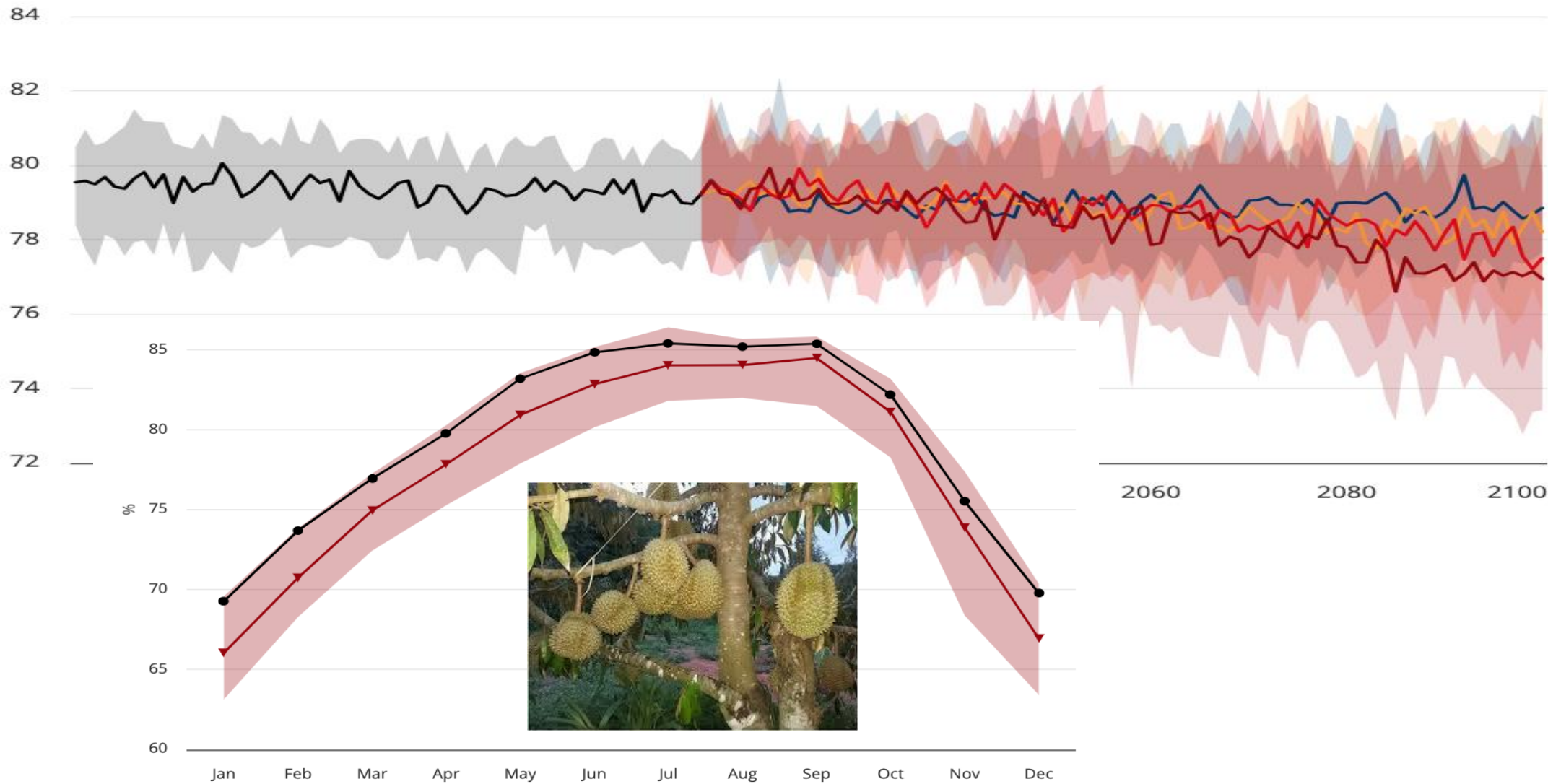
วิกฤต... สภาพภูมิอากาศ



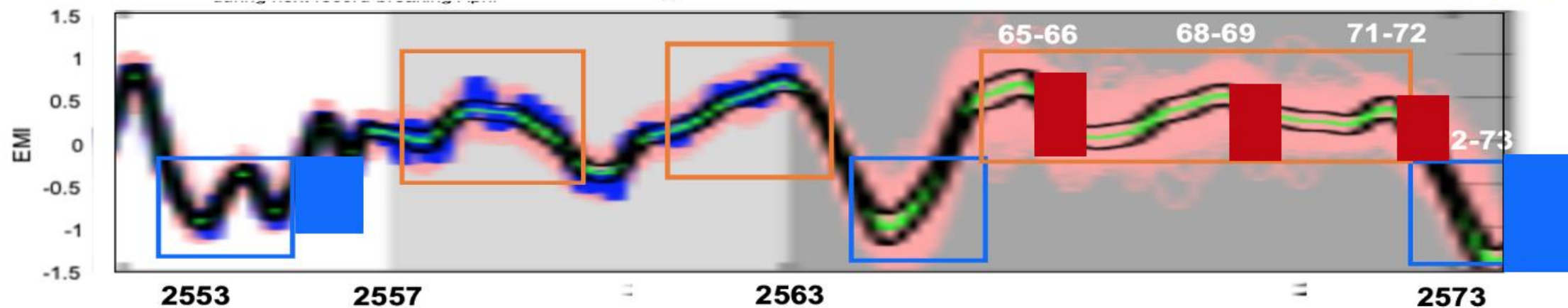
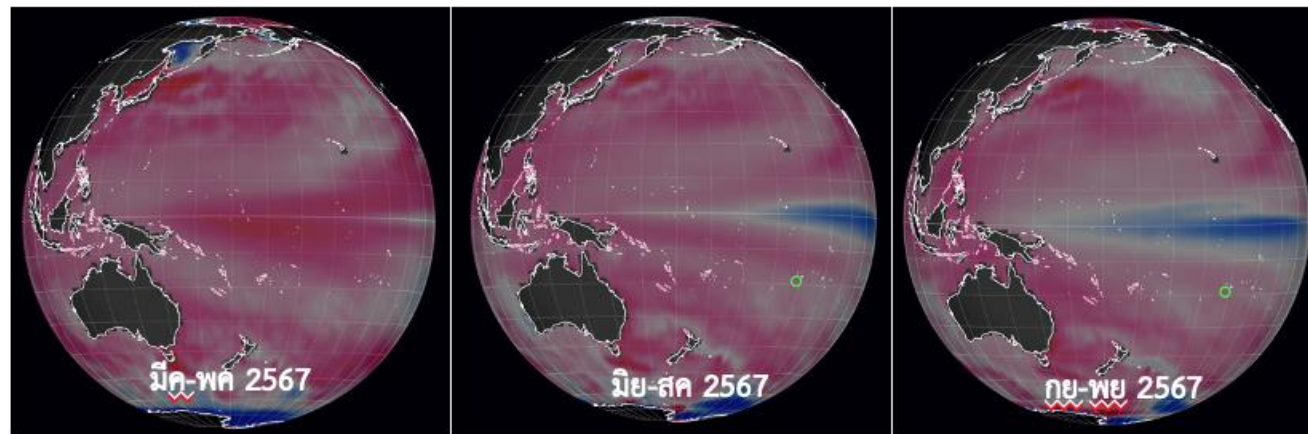
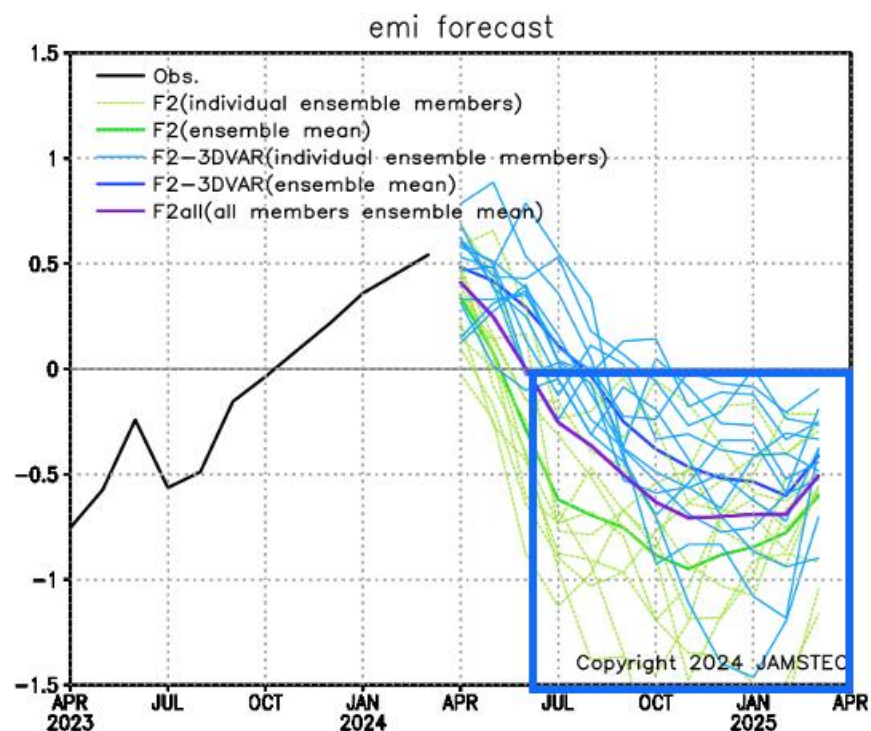
ปริมาณฝน (น้ำ)
อุณหภูมิ
ความชื้น



อนาคตความชื้นสัมพัทธ์ลดลงอย่างมีนัยสำคัญ

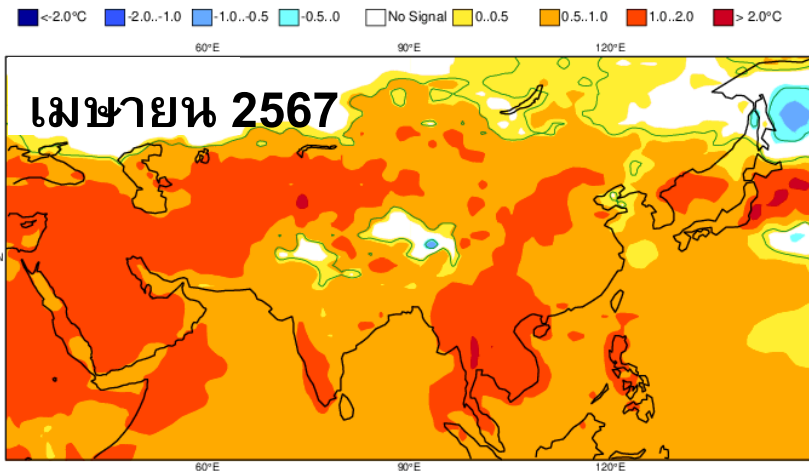


More climate extreme events

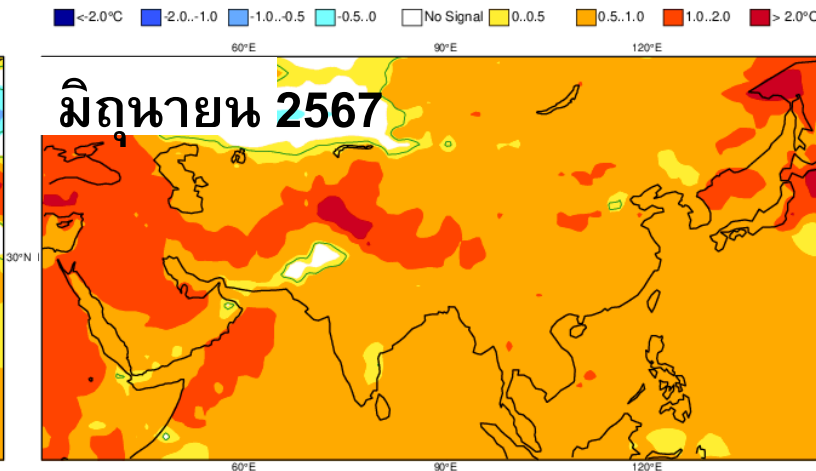


การเปลี่ยนผ่านไปสู่ La Nina ทำให้สภาพอากาศปลายปี 2567 ไม่ร้อน

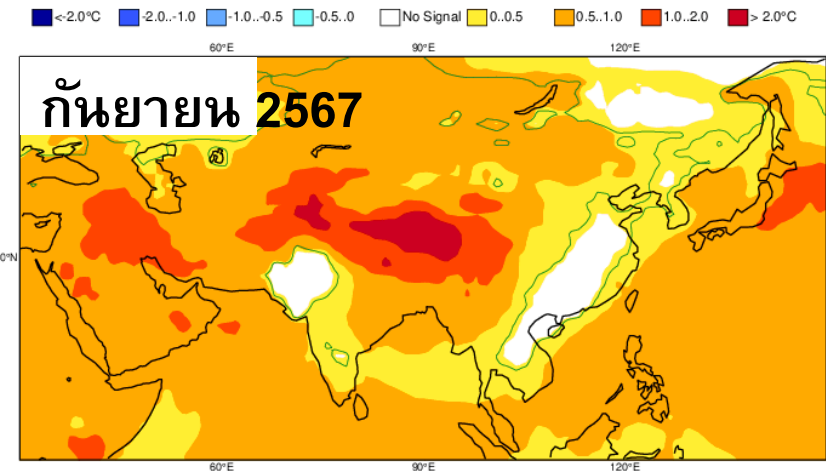
ECMWF Seasonal Forecast
Mean 2m temperature anomaly
Forecast start is 01/03/24, climate period is 1993-2016
Ensemble size = 51, climate size = 600



System 5 WRF Seasonal Forecast
AMJ 2024 an 2m temperature anomaly
Shaded areas significant at 10% level
Forecast start is 01/05/24, climate period is 1993-2016
Solid contour at 1% level
Ensemble size = 51, climate size = 600

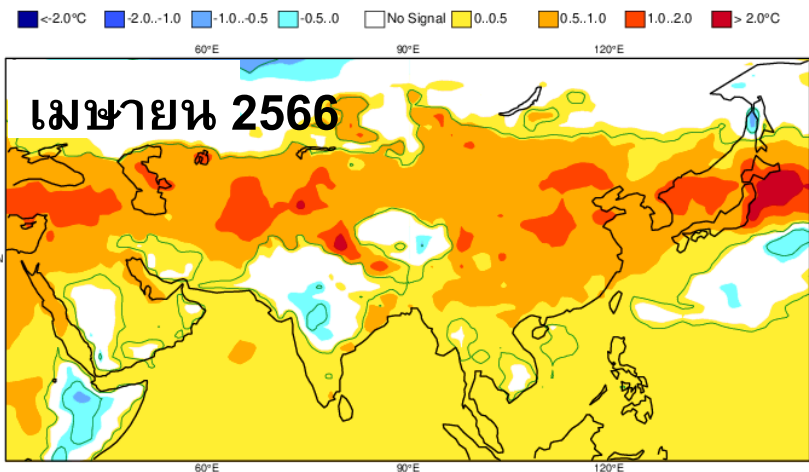


Sys ECMWF Seasonal Forecast
JJA Mean 2m temperature anomaly
Shaded areas significant at 1%
Forecast start is 01/05/24, climate period is 1993-2016
Solid contour at 1% level
Ensemble size = 51, climate size = 600

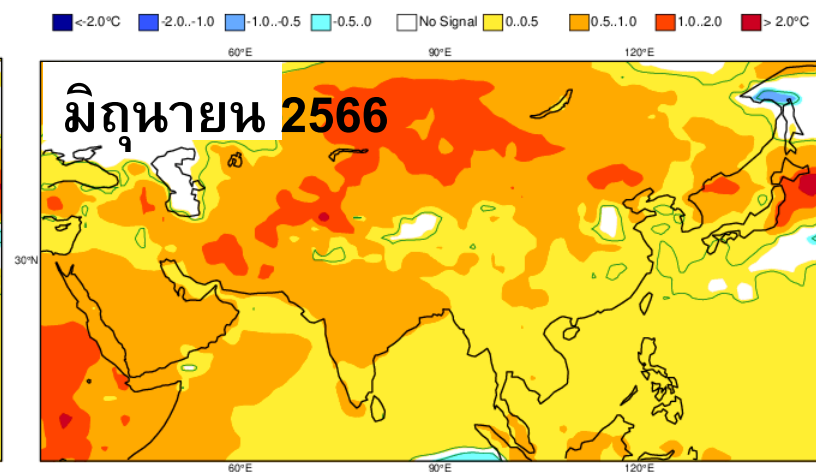


System 5
SON 2024
Shaded areas significant at 10% level
Solid contour at 1% level

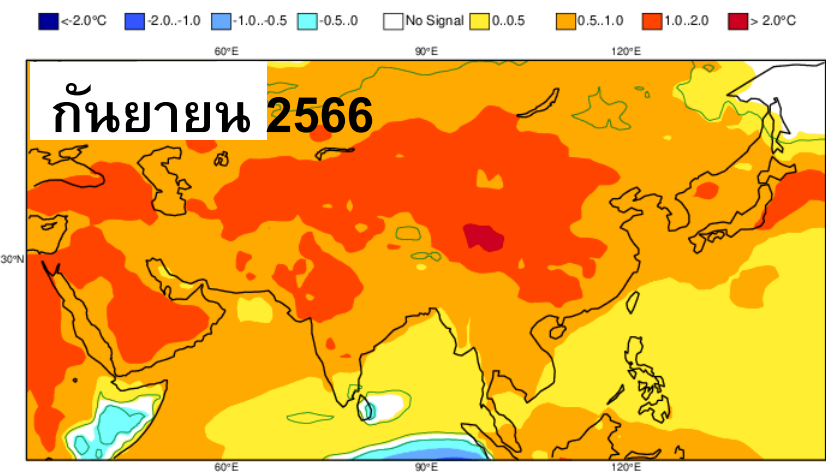
ECMWF Seasonal Forecast
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System 5 ECMWF Seasonal Forecast
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System 5
SON 2023
Shaded areas significant at 10% level
Solid contour at 1% level

การคาดการณ์ปริมาณฝนรุนแรง

17-24 มิย

25-1 กค

1-8 กค

8-15 กค

15-22 กค

22-29 กค

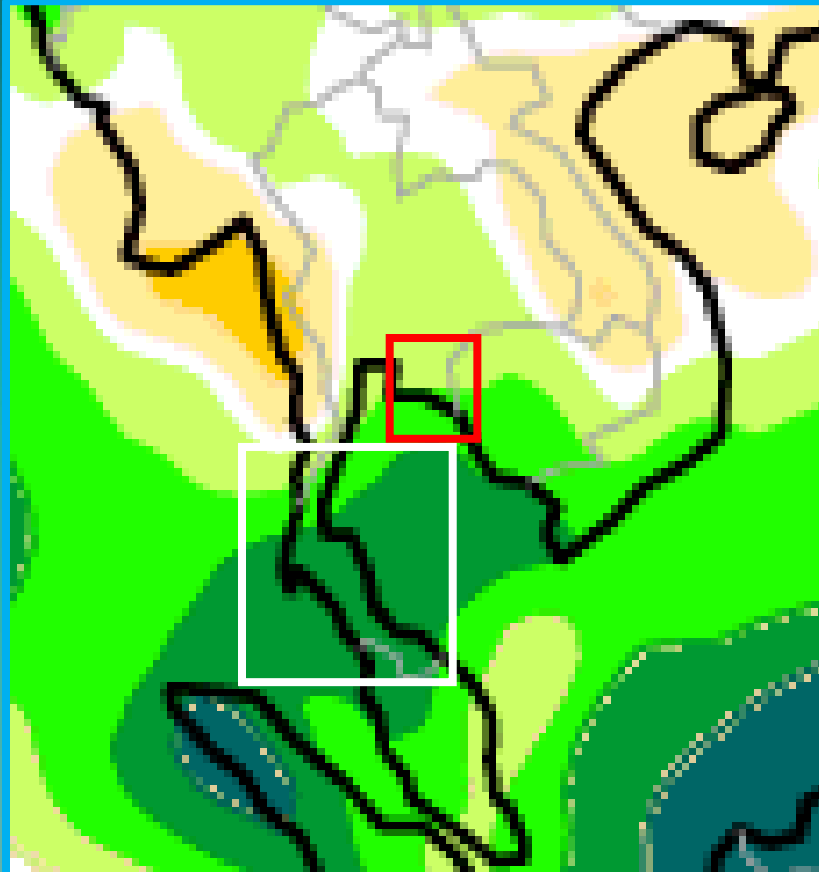
Extended range: EFI for total precipitation (efi_index)

-1 -0.9 -0.8 -0.7 -0.6 -0.5 -0.3 -0.1 0.1 0.3 0.5 0.6 0.7 0.8 0.9

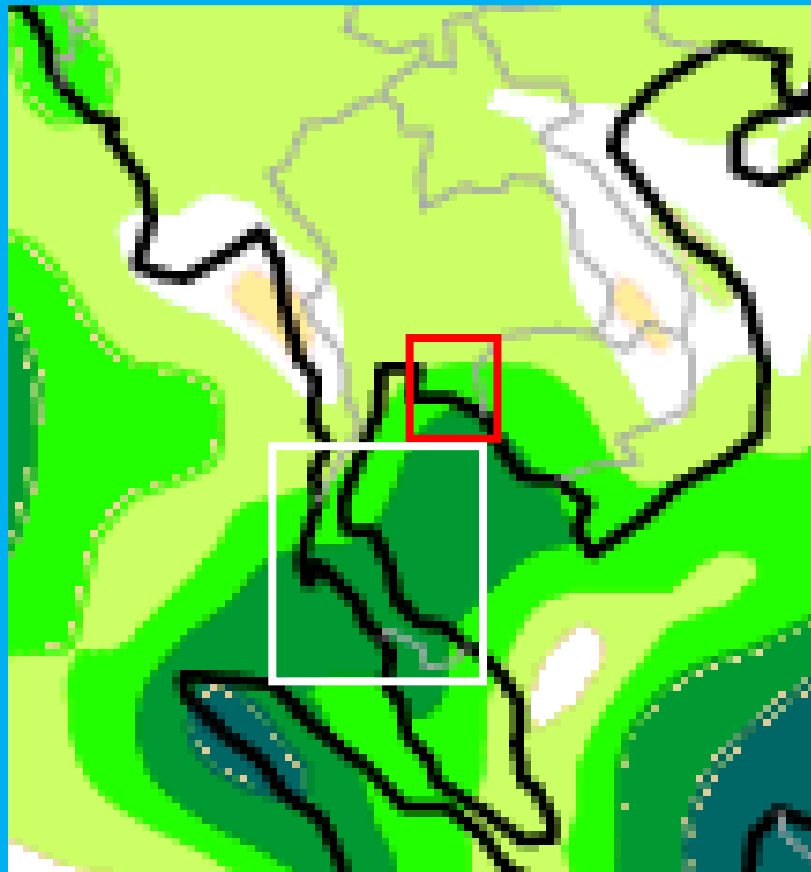


การคาดการณ์ปริมาณฝนล่าสุด

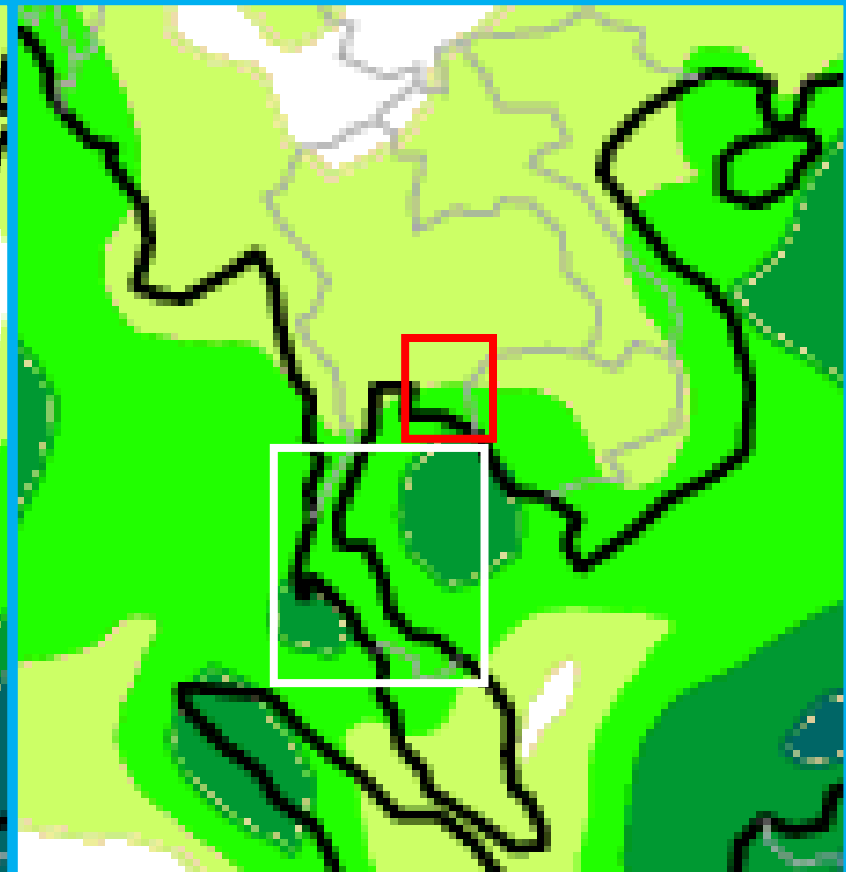
มิถุนายน-สิงหาคม



กรกฎาคม-กันยายน



สิงหาคม-ตุลาคม

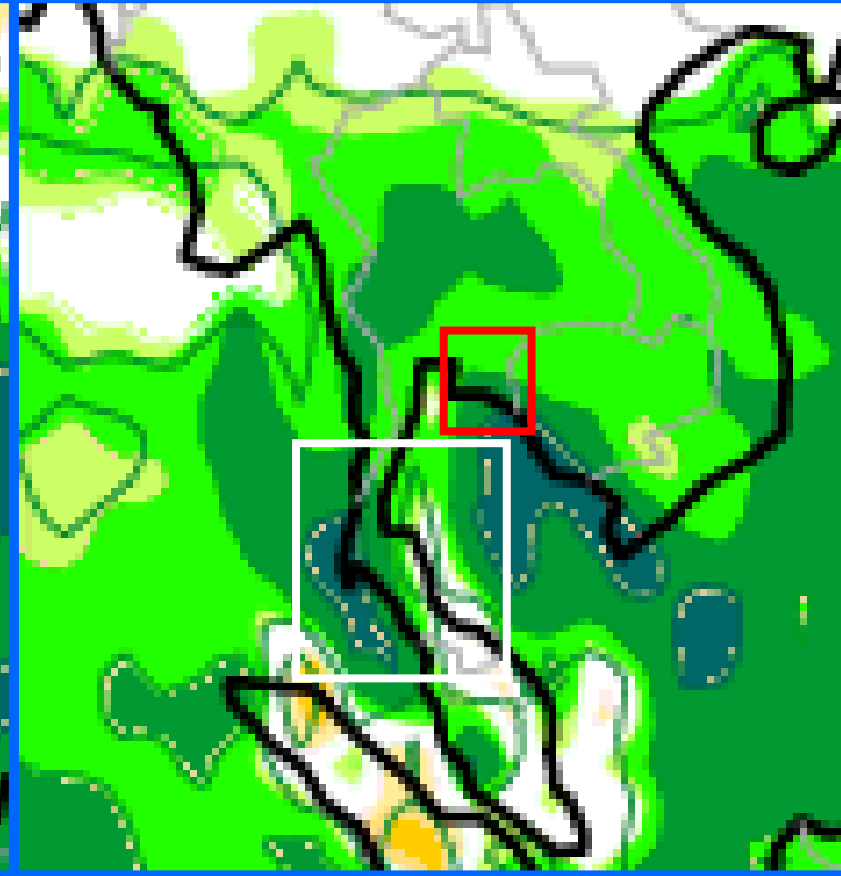
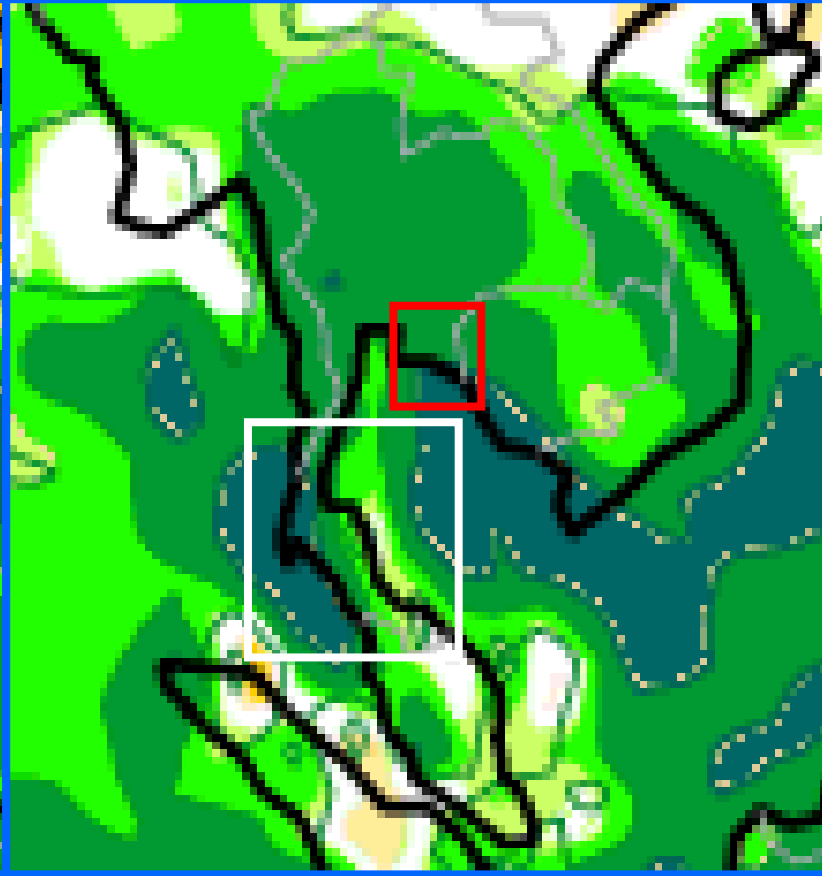
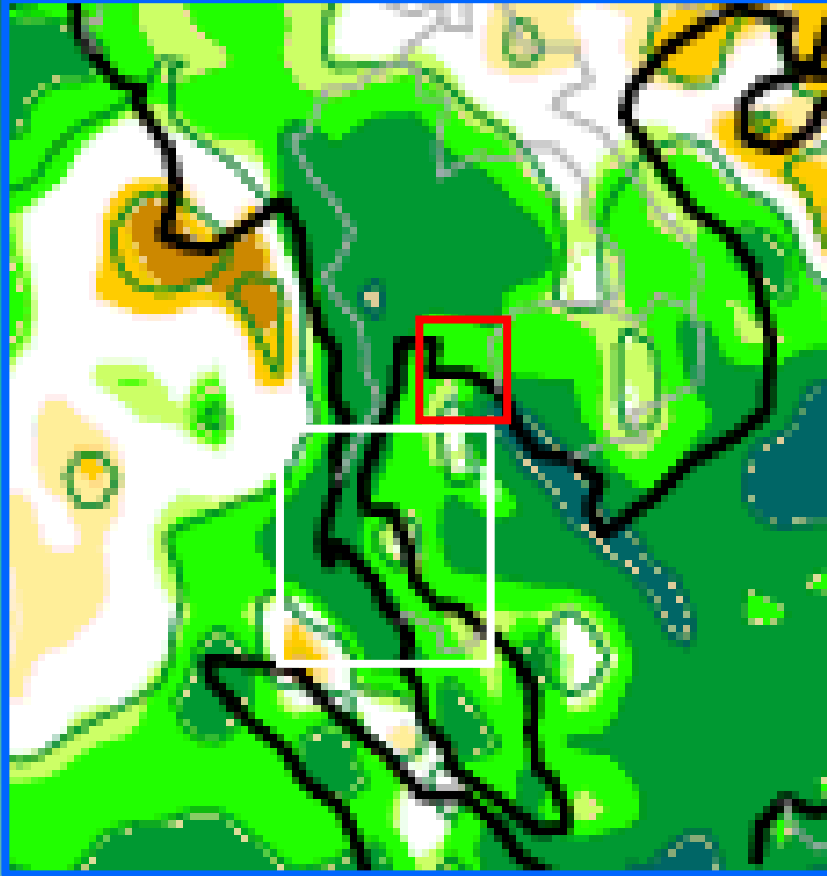


การคาดการณ์ปริมาณฝนตกหนักล่าสุด

มิถุนายน-สิงหาคม

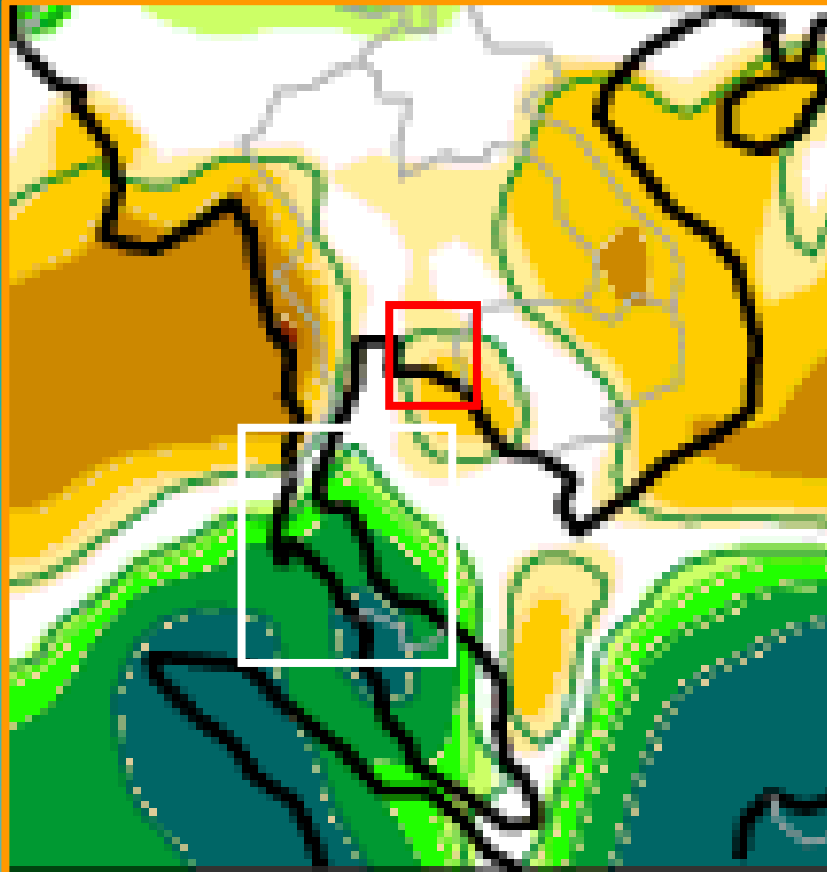
กรกฎาคม-กันยายน

สิงหาคม-ตุลาคม

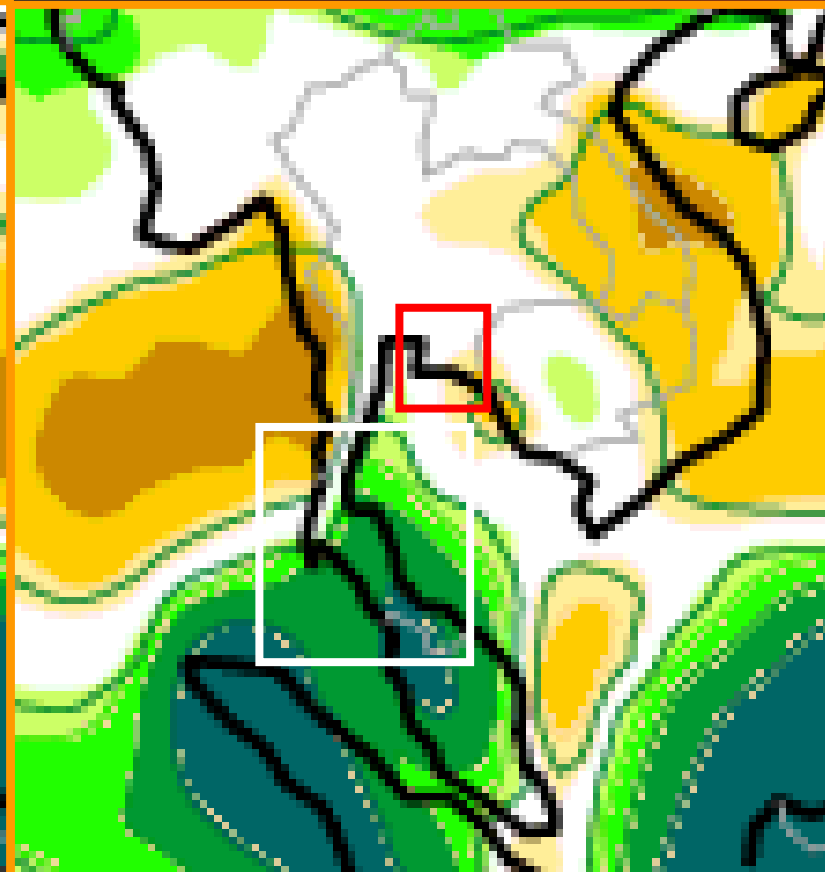


การคาดการณ์ปริมาณฝนตกเบาที่สุด

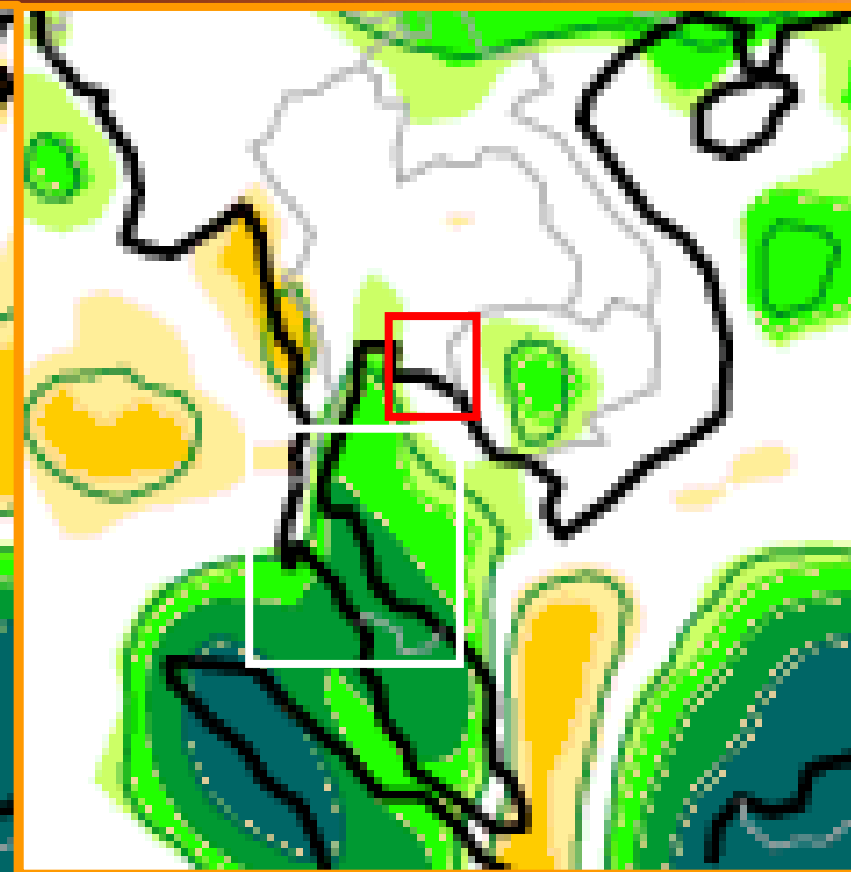
มิถุนายน-สิงหาคม



กรกฎาคม-กันยายน



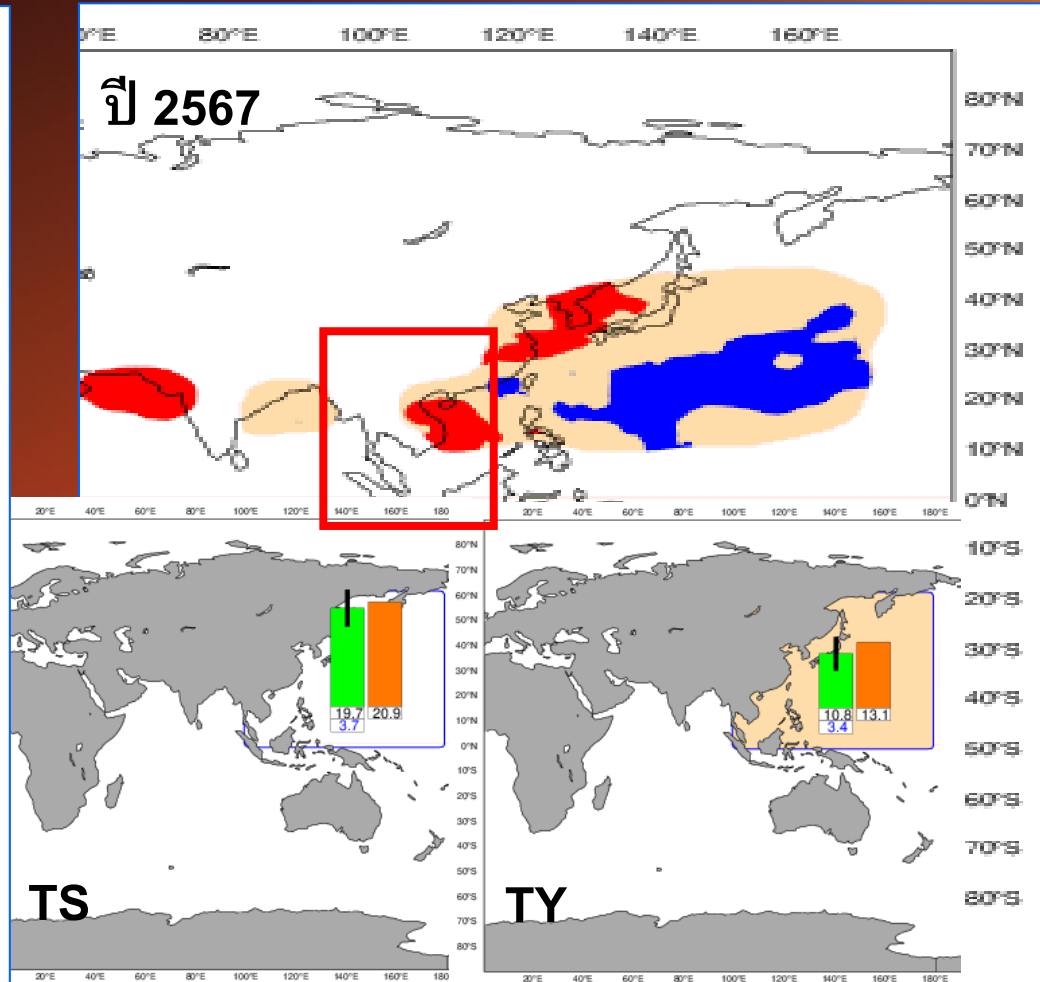
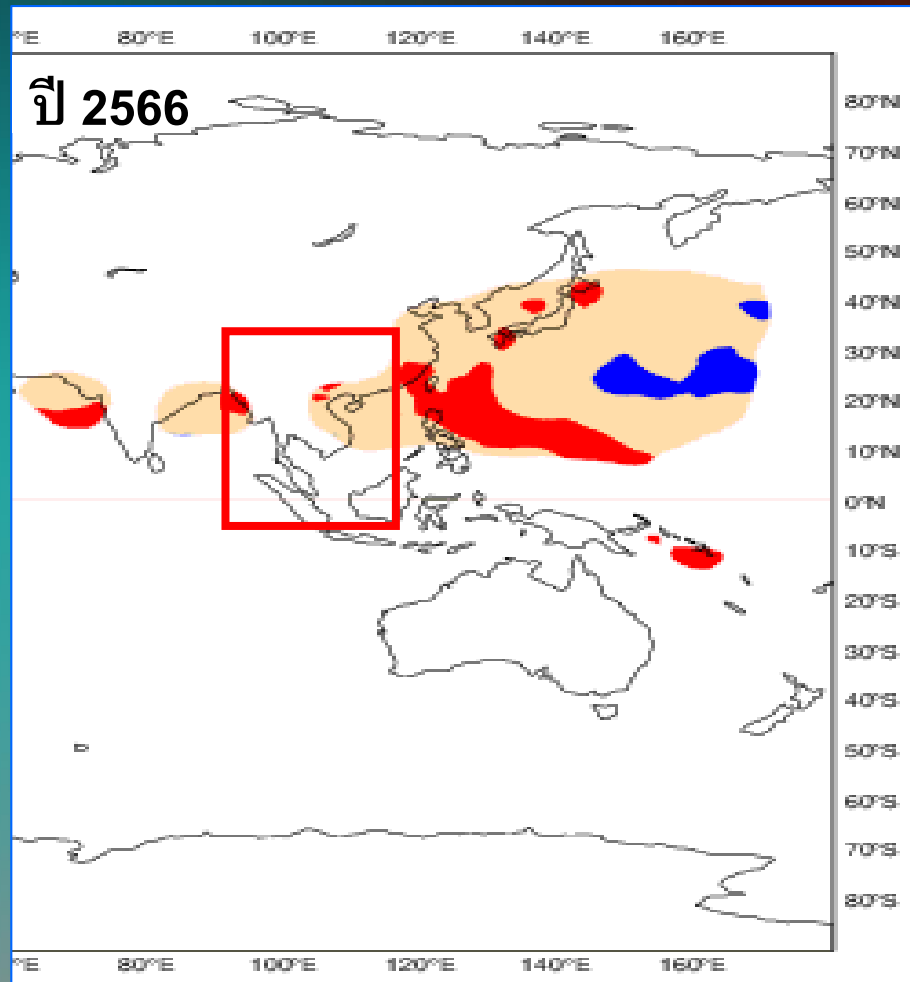
สิงหาคม-ตุลาคม



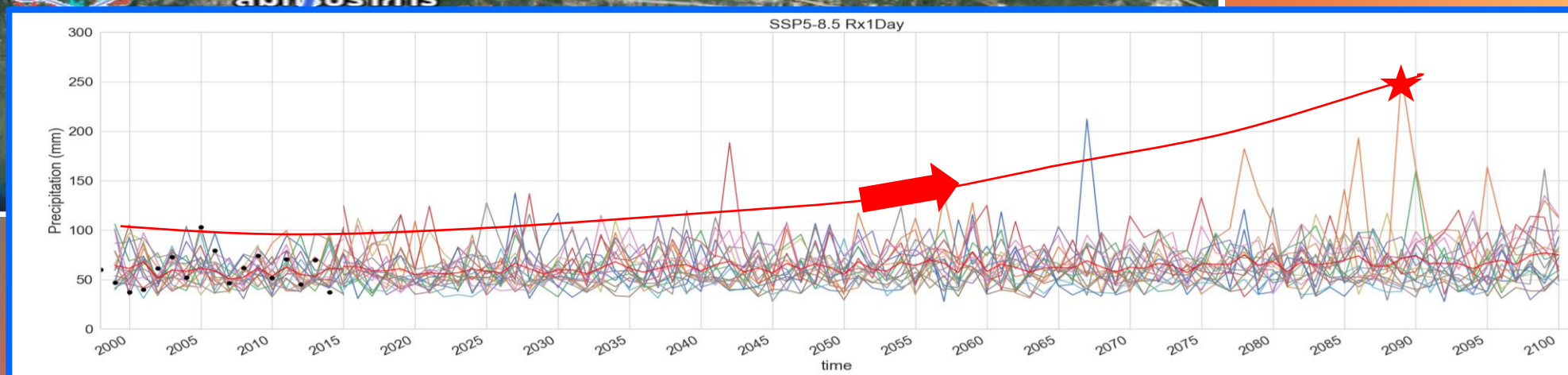
ปริมาณฝนคาดการณ์ 2567 เชิงคุณภาพ

[illegible]

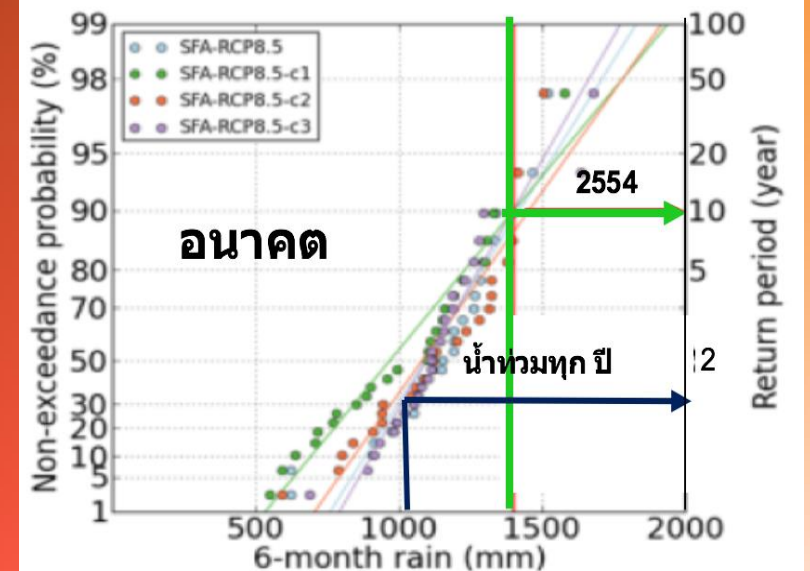
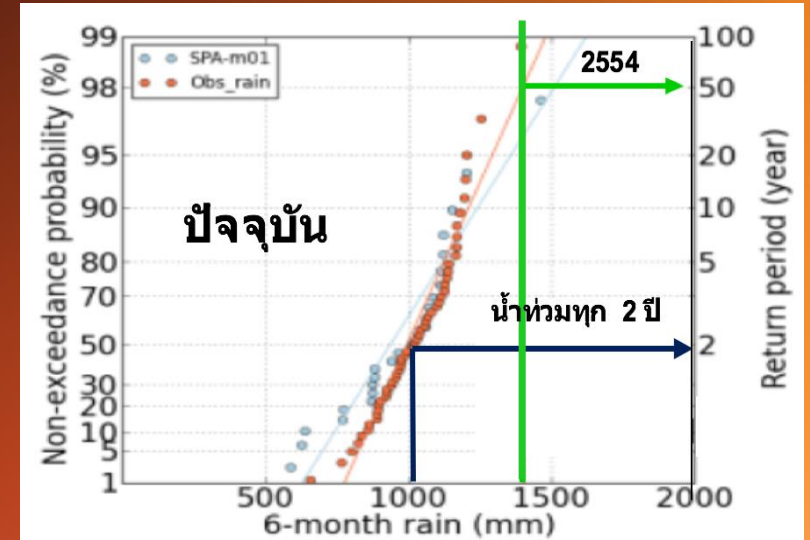
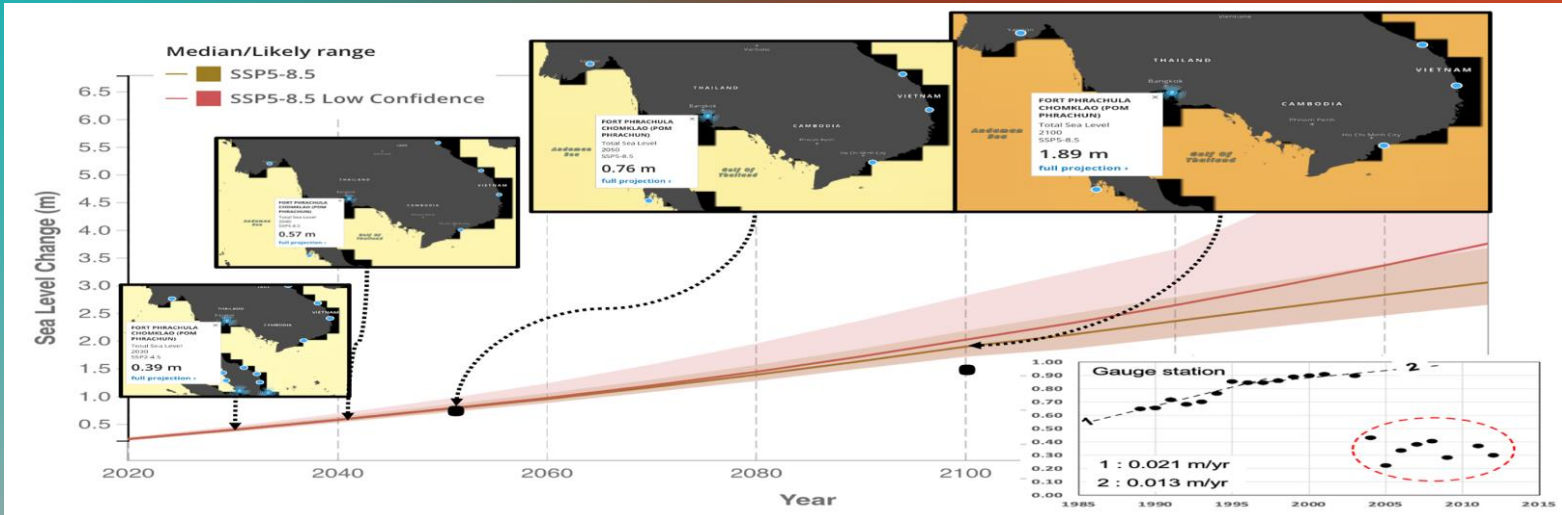
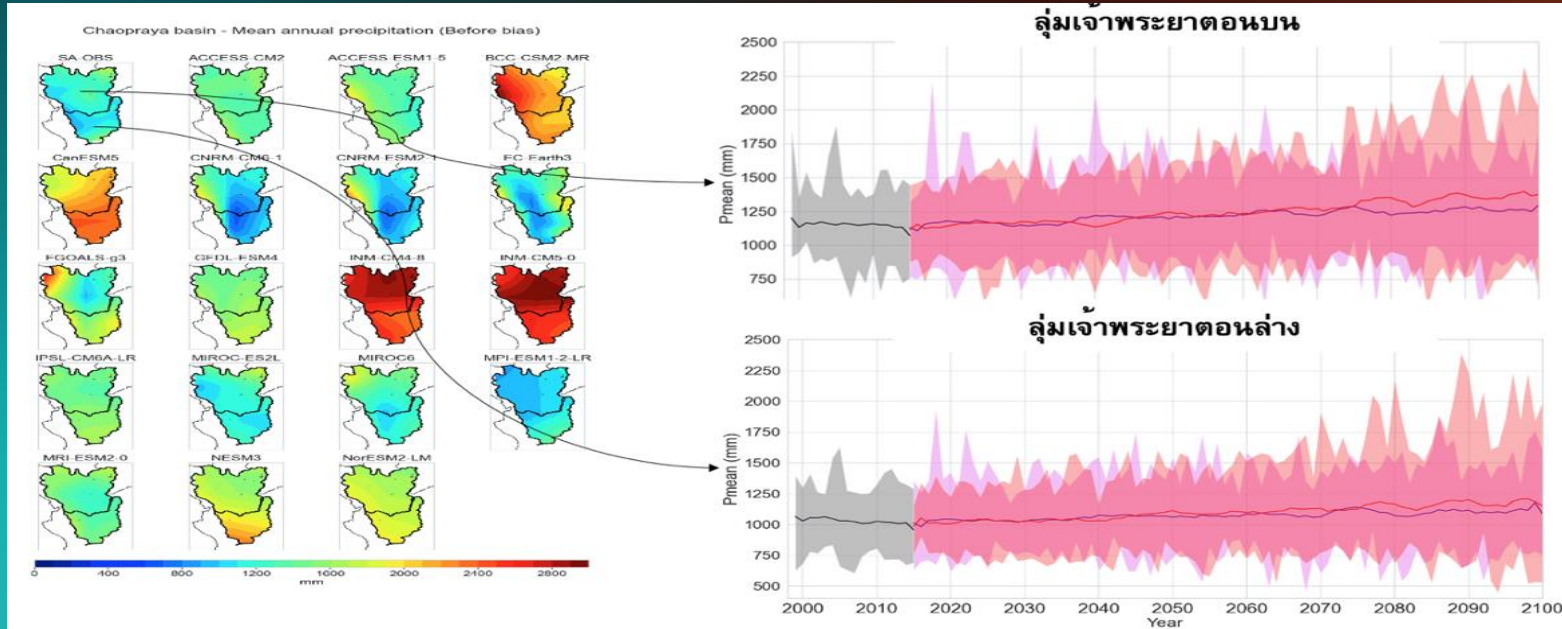
ความเสี่ยงน้ำมากจากพายุ ?



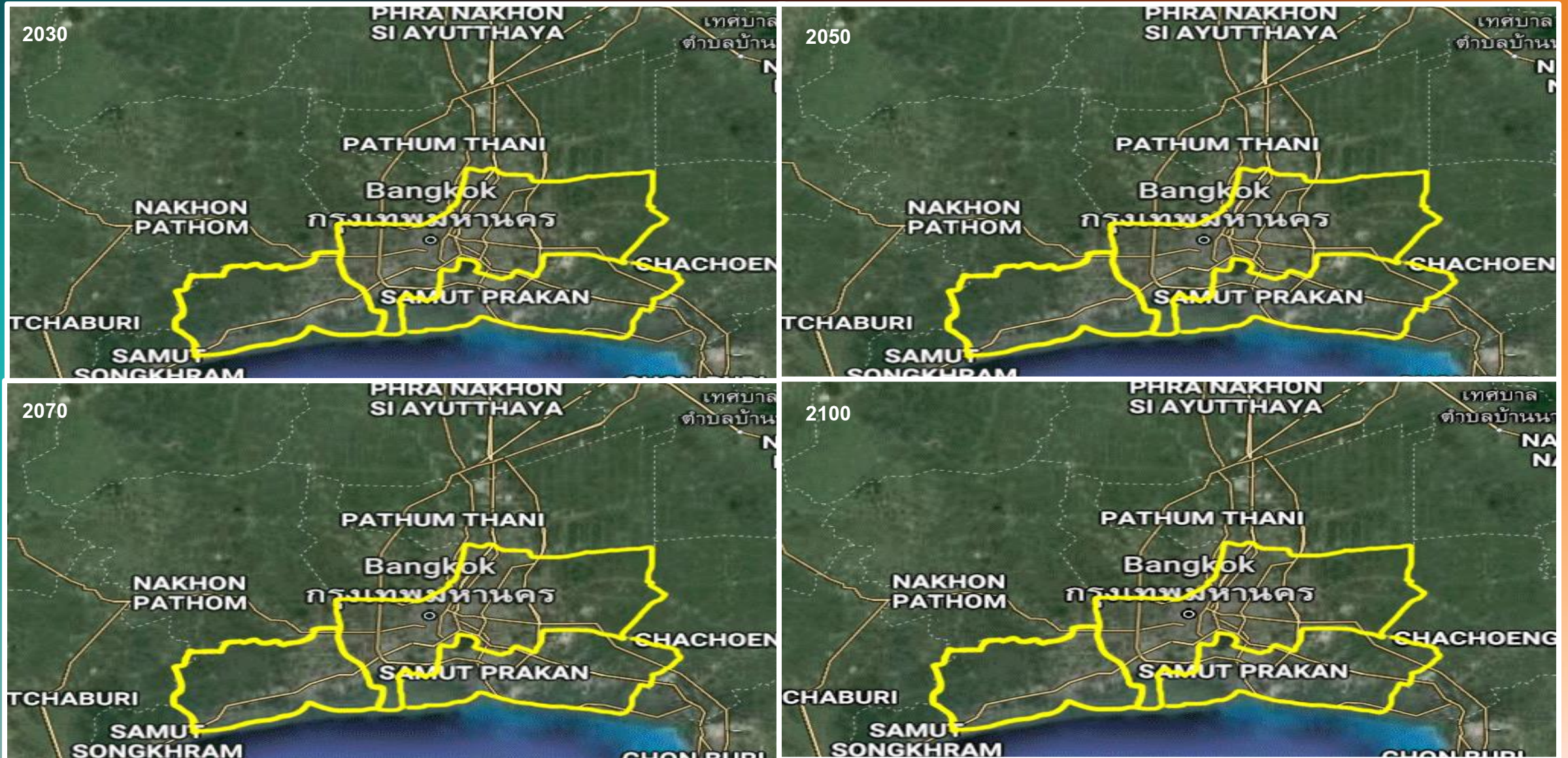
Working Group II – Impacts, Adaptation and Vulnerability



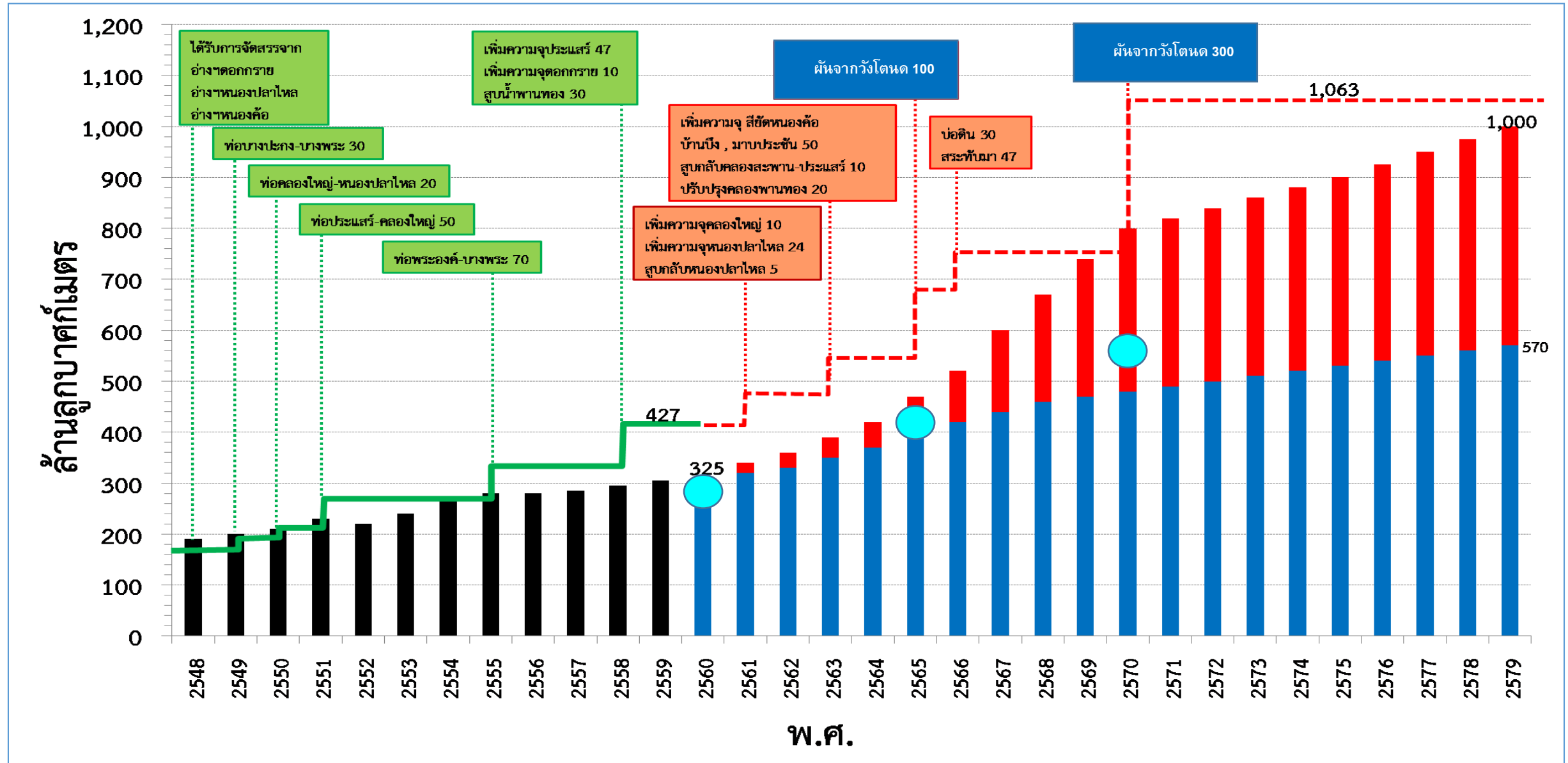
Risk/impact over CPRB ?



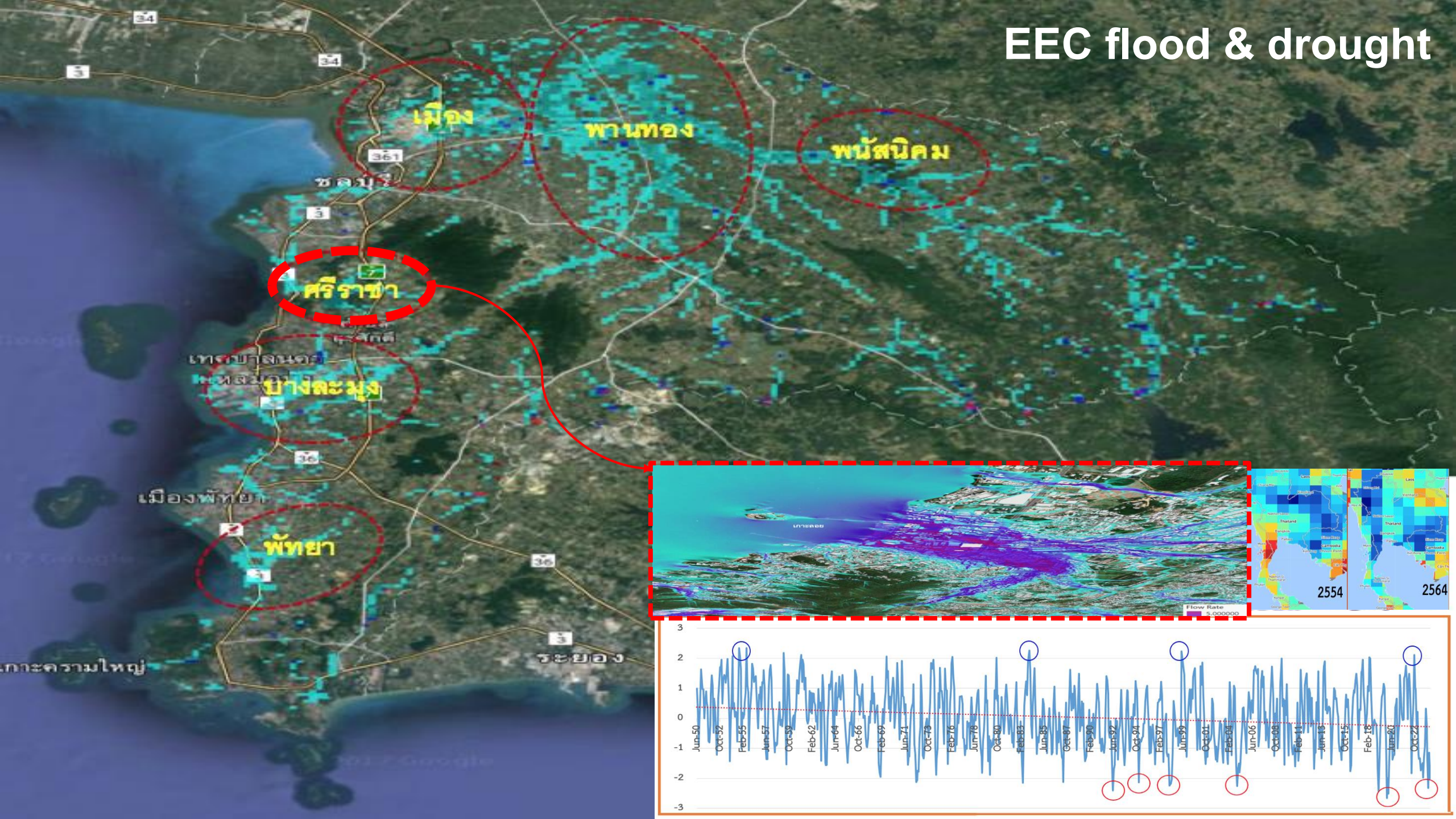
Risk/impact over CPRB ?

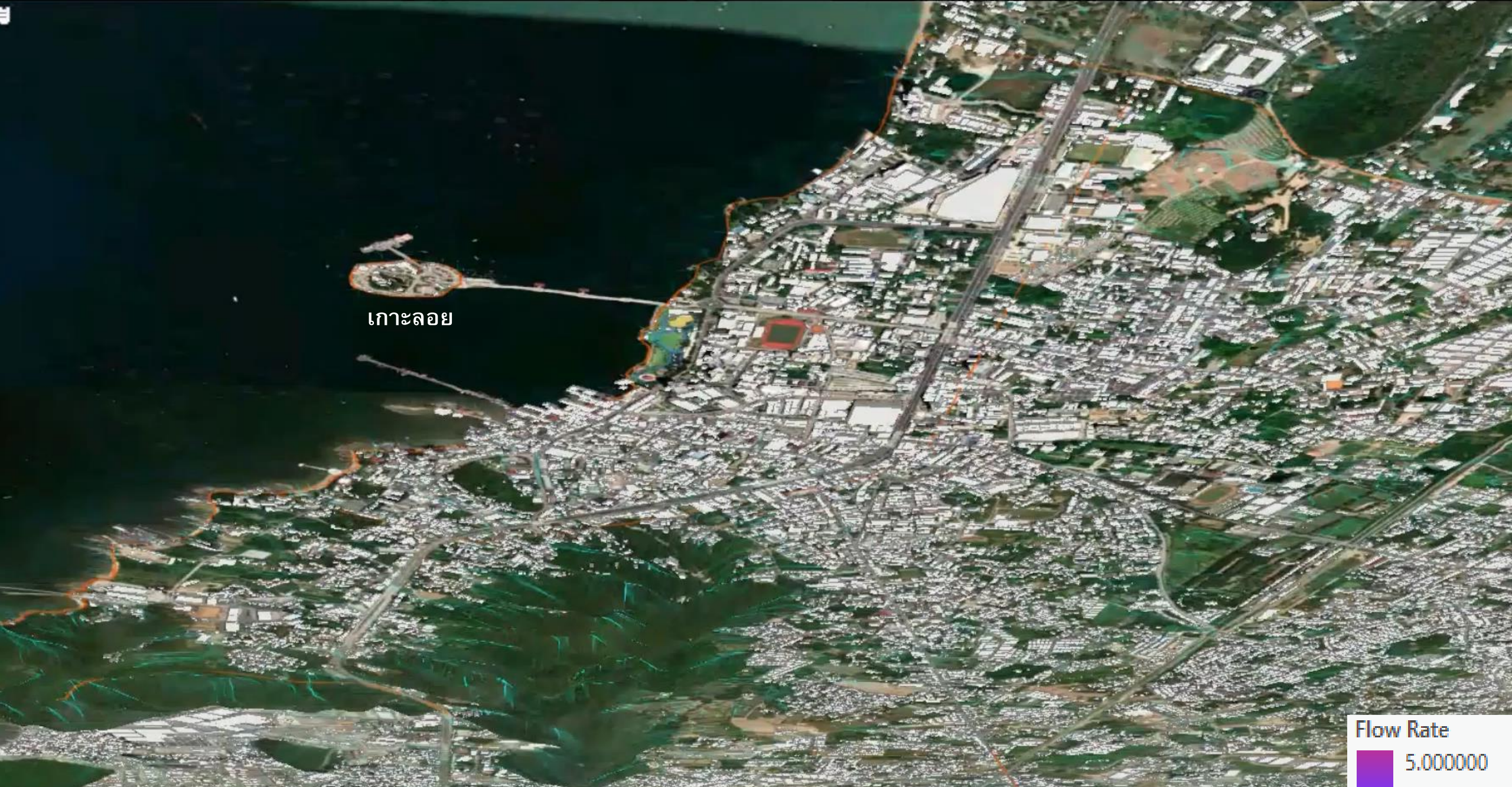


EEC future climate and water crisis ?

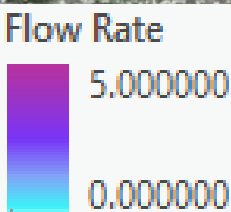


EEC flood & drought





เกาะลอย



Flood simulation using a oblique view to visualize inundation area : Sriracha & Surasak District / Rainfall rate 200 mm (6hr)

The Forestias, MQDC : Climate Resilient community



ปลูกต้นไม้ และผักสวนครัว

ถนน และทางเท้าเย็น

หลังคาเย็น

การลด GHG

หลังคา และผนังเขียว

ห้องพักผ่อนติตแอร์สาธารณะ

พื้นที่ชุ่มน้ำ



Retention vol. design

Max. Flow Depth

Accumulated Rainfall at Bangkok Unit : mm.

Return Period (Year)	5	10	15	30	60	120	180	360	720	1440
2	11.29	20.18	24.95	42.45	58.70	72.40	78.30	85.80	90.00	93.60
5	14.08	25.33	31.68	54.30	76.00	95.00	103.50	114.00	120.00	122.40
7	14.86	26.90	33.73	57.95	81.50	103.00	111.30	123.00	129.60	134.40
10	15.69	28.37	35.68	61.45	86.80	109.20	119.40	132.00	139.20	144.00
20	17.08	30.98	39.23	67.85	96.50	122.40	134.10	149.40	157.20	163.20
25	17.89	32.51	41.18	71.26	101.43	128.86	141.06	156.97	165.42	171.30
50	19.64	35.76	45.48	78.91	112.82	143.92	157.87	176.10	185.65	192.36
100	21.38	39.02	49.78	86.56	124.22	158.98	174.67	195.22	205.88	213.42

Before Devel. $Q = 0.4IA$
After Devel. $Q = 0.8IA$
 $Q_{pmax} = 30 \text{ m}^3/\text{min}$

Retention vol. required
 $0.4 \times (0.0868 \text{ to } 0.1194) \times 169,220$
 $= 5,875 \text{ to } 8,082 \text{ m}^3$

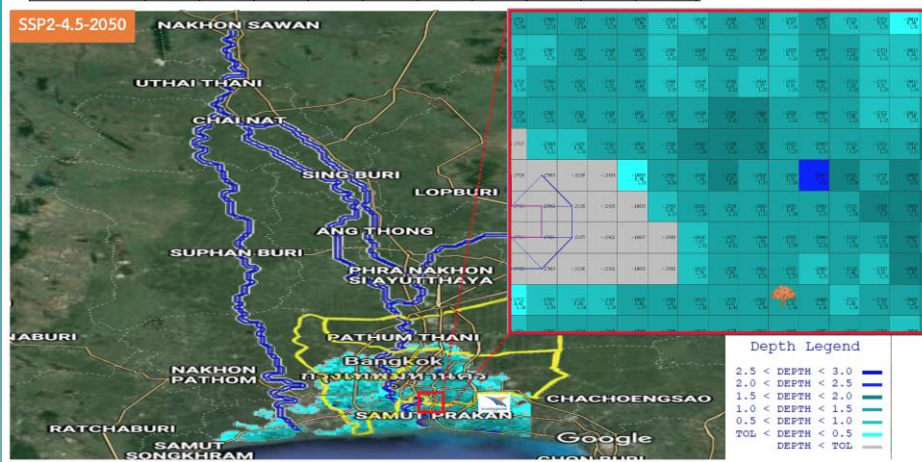
Catchment Area about Drain to Forest 106 rai (169,220 m²)

Retention Pond design volume = 5,110 m³

Rain Garden Layout

Depth Legend

- 2.5 < DEPTH < 3.0
- 2.0 < DEPTH < 2.5
- 1.5 < DEPTH < 2.0
- 1.0 < DEPTH < 1.5
- 0.5 < DEPTH < 1.0
- TOL < DEPTH < 0.5
- DEPTH < TOL



Thank you

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