



Webinar Series on Climate Change Projection for Disaster
Risk Reduction in Asia Pacific Region

2026/2/27

SENTAN-P4 Webinar with Korea
National Disaster Management
Research Institute (NDMI)

Introduction to Japan's National Climate Program (SENTAN Program)

Nobuhito Mori

PI of SENTAN Program Theme 4 by MEXT, Japan

Professor

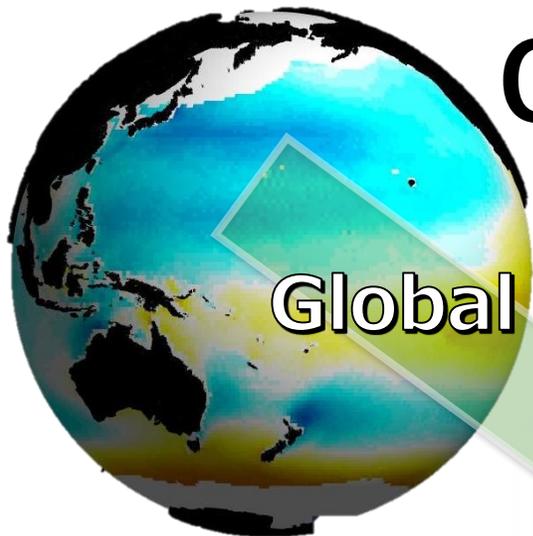
Disaster Prevention Research Institute (DPRI)

Kyoto University

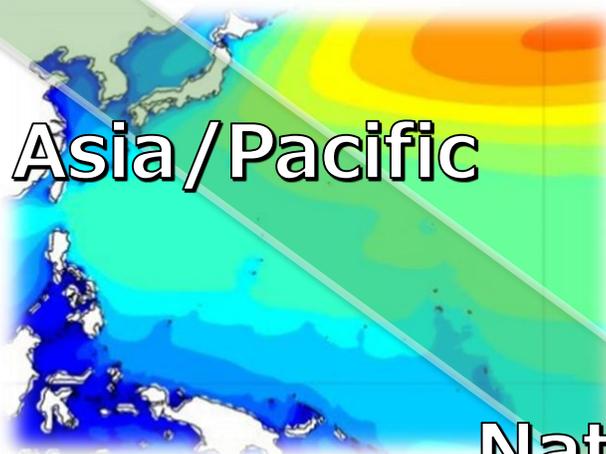


Global to local climate risk

Time-line
Hazard intensity
Adaptation



Typhoons, Extra-TCs
Sea level rise



Heavy precipitation
Storm surges
Water resources

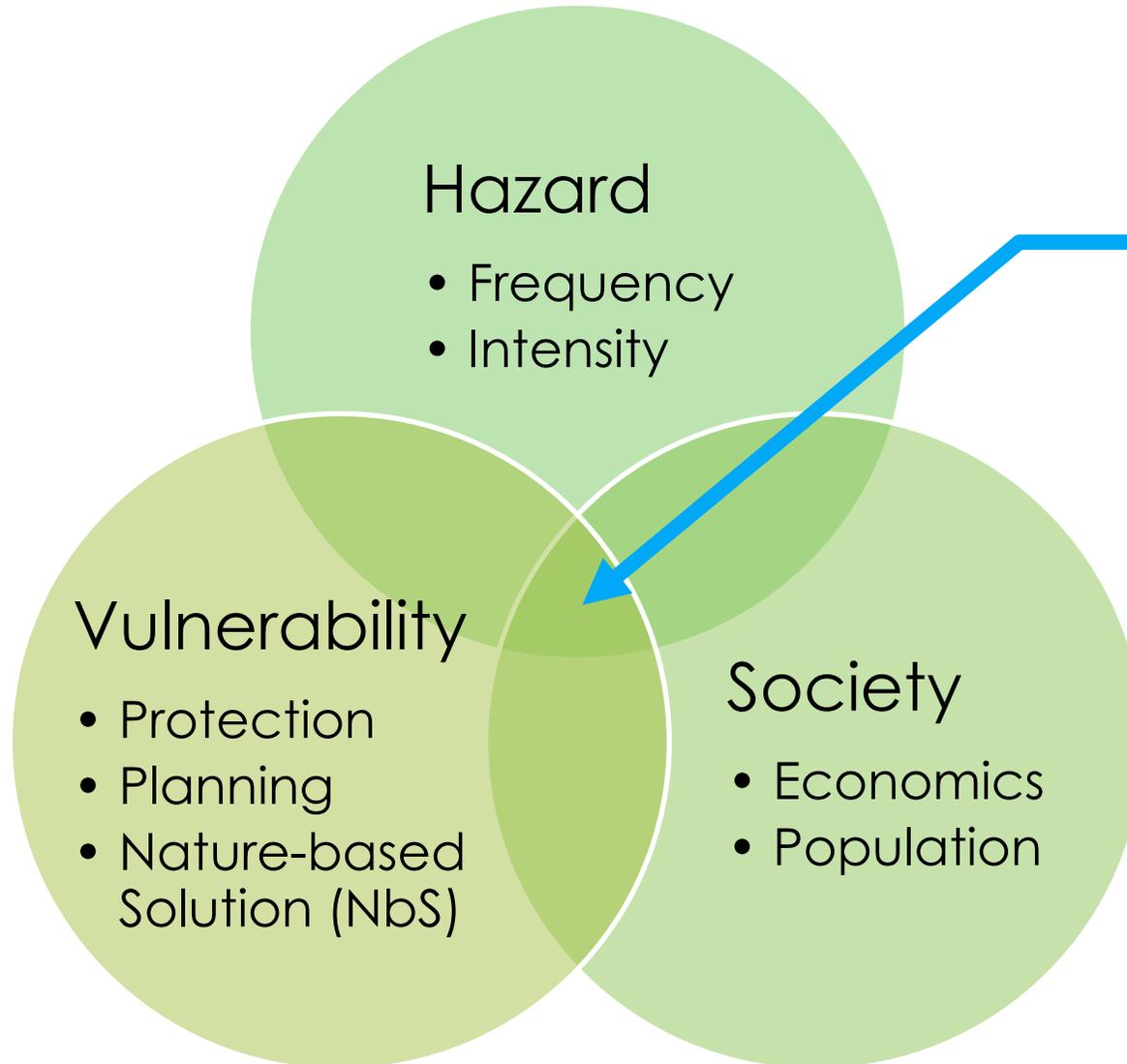
National

River and coastal flooding
Hazard Risk

Local

Extreme Projections
Monsoon/Polar low
ENSO
Tropical
Cyclones

Quantify the Hazard Risks



Potential risk change



- sea-level rise
- precipitation
- river flooding
- coastal flooding
- water resources
- heatwave



SENTAN Program

2022-2026

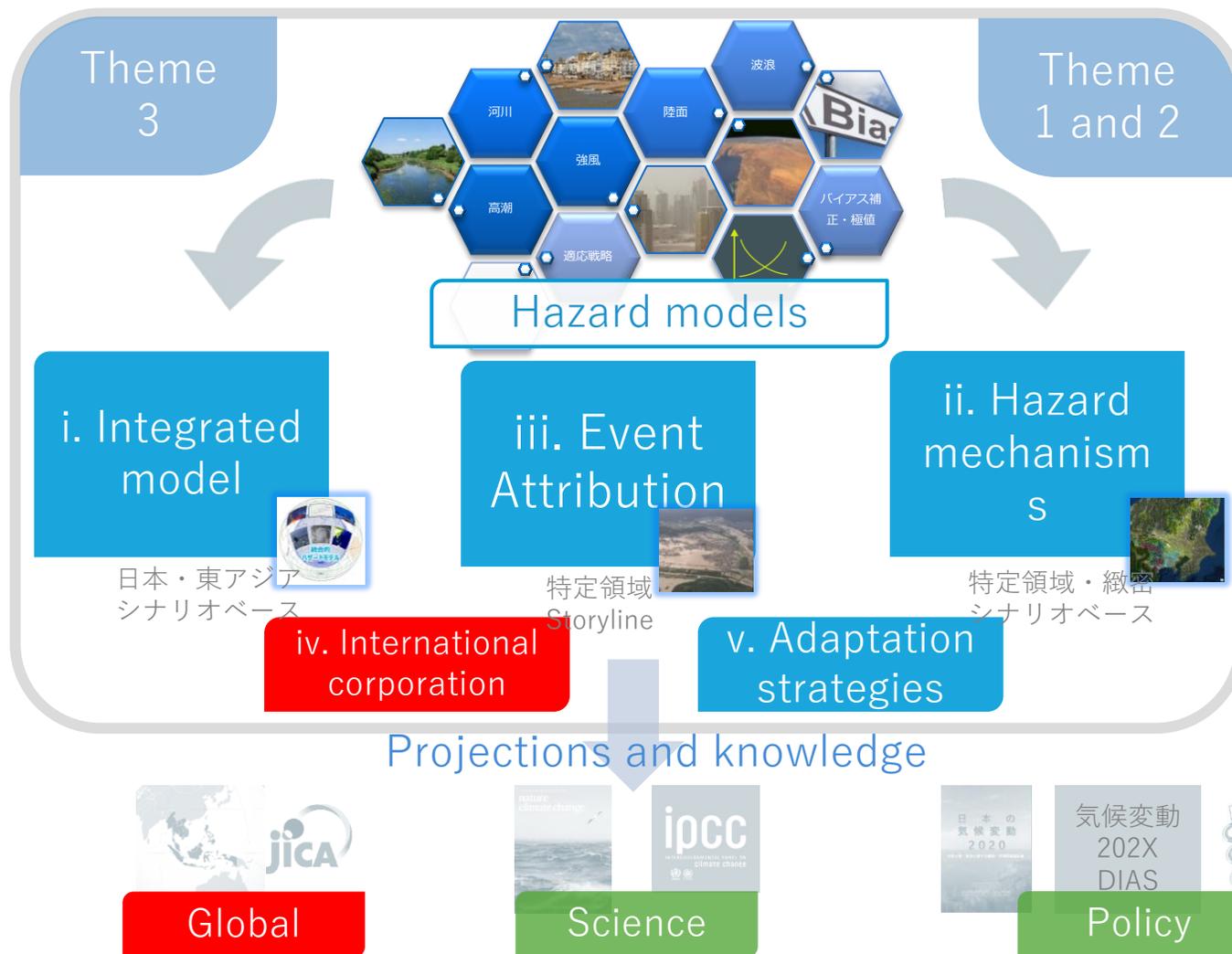
Japan's National Climate Research Program by MEXT

1. Theme 1 AORI, U Tokyo Prof. Watanabe
2. Theme 2 JAMSTEC Dr. Kawamiya
- 3. Theme 3 MRI Dr. Tsujino**
- 4. Theme 4 DPRI, Kyoto Prof. Mori**

Cooperative working groups (WGs)

- EA, AI, land model, SLR, wildfire, JAXA and international cooperation

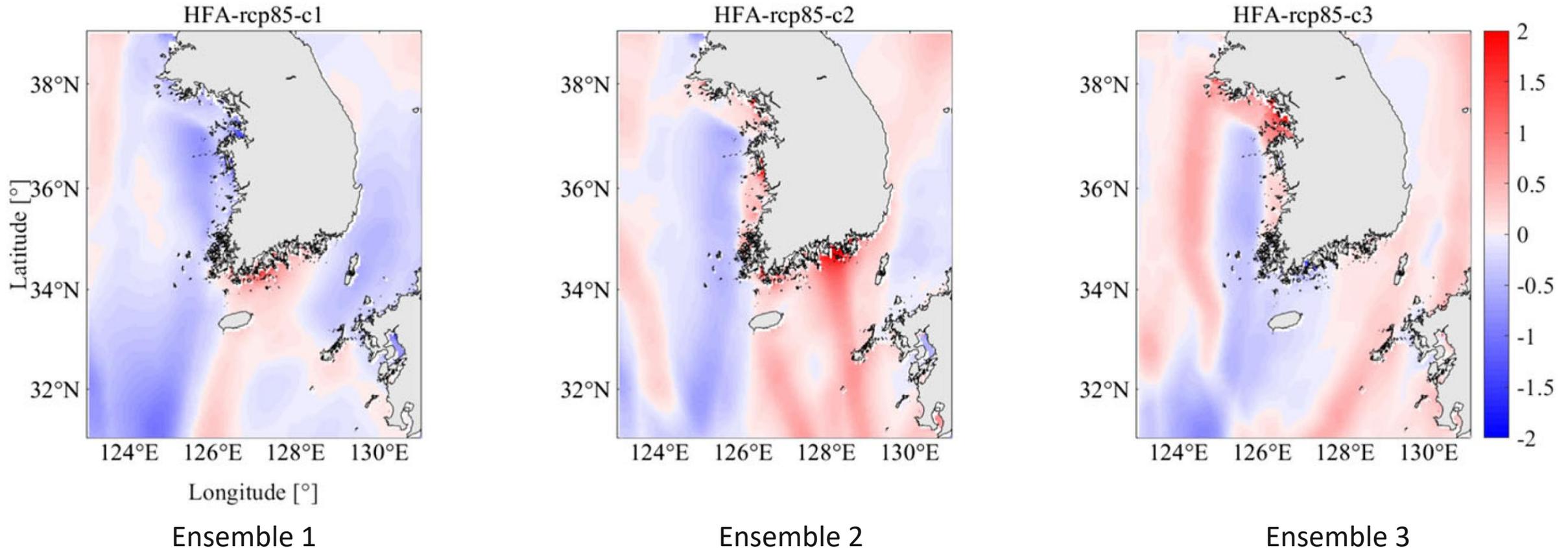
SENTAN Program **Theme 4: Outline**



- i. Integrated hazard model development**
 - Prof. T. Sayama (Kyoto U)
- ii. Hazard mechanisms**
 - Prof. K. Tanaka (Kyoto U)
 - Prof. M. Fujii (Hokkaido U)
- iii. Hazard Event Attribution**
 - Prof. T. Takemi (Kyoto U)
- iv. International cooperation**
 - Prof. Y. Tachikawa (Kyoto U)
- v. Adaptation strategy**
 - Prof. T. Fujimi (Kyoto U)

Contribution to science and society

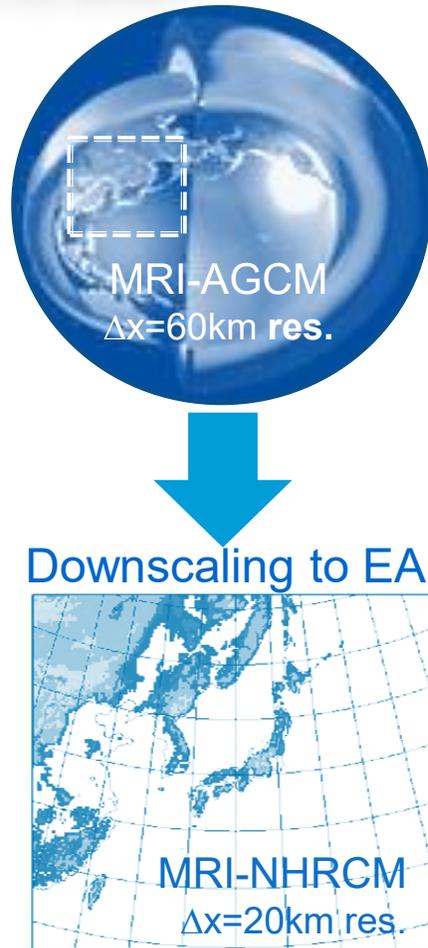
Storm surge projection is sensitive to particular events



Future change of projected maximum storm surge heights for 30 years projection
RCP8.5 scenario

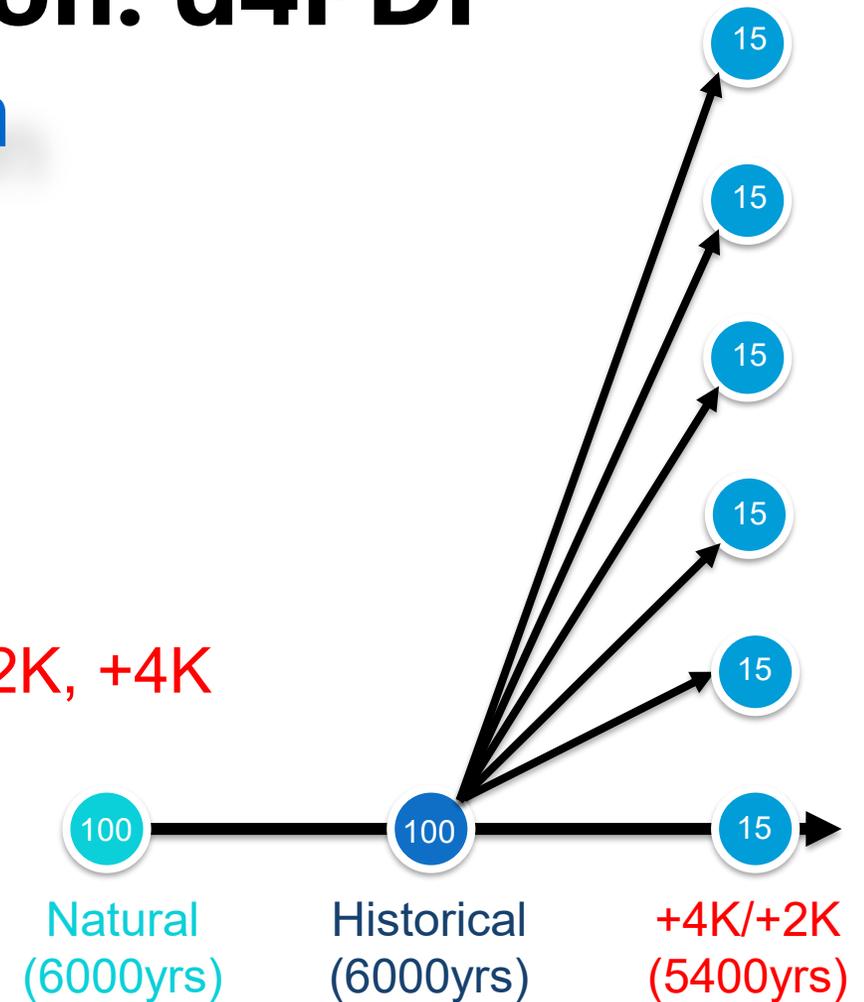
Large Ensemble Projection: d4PDF

Model



Exp. Configuration

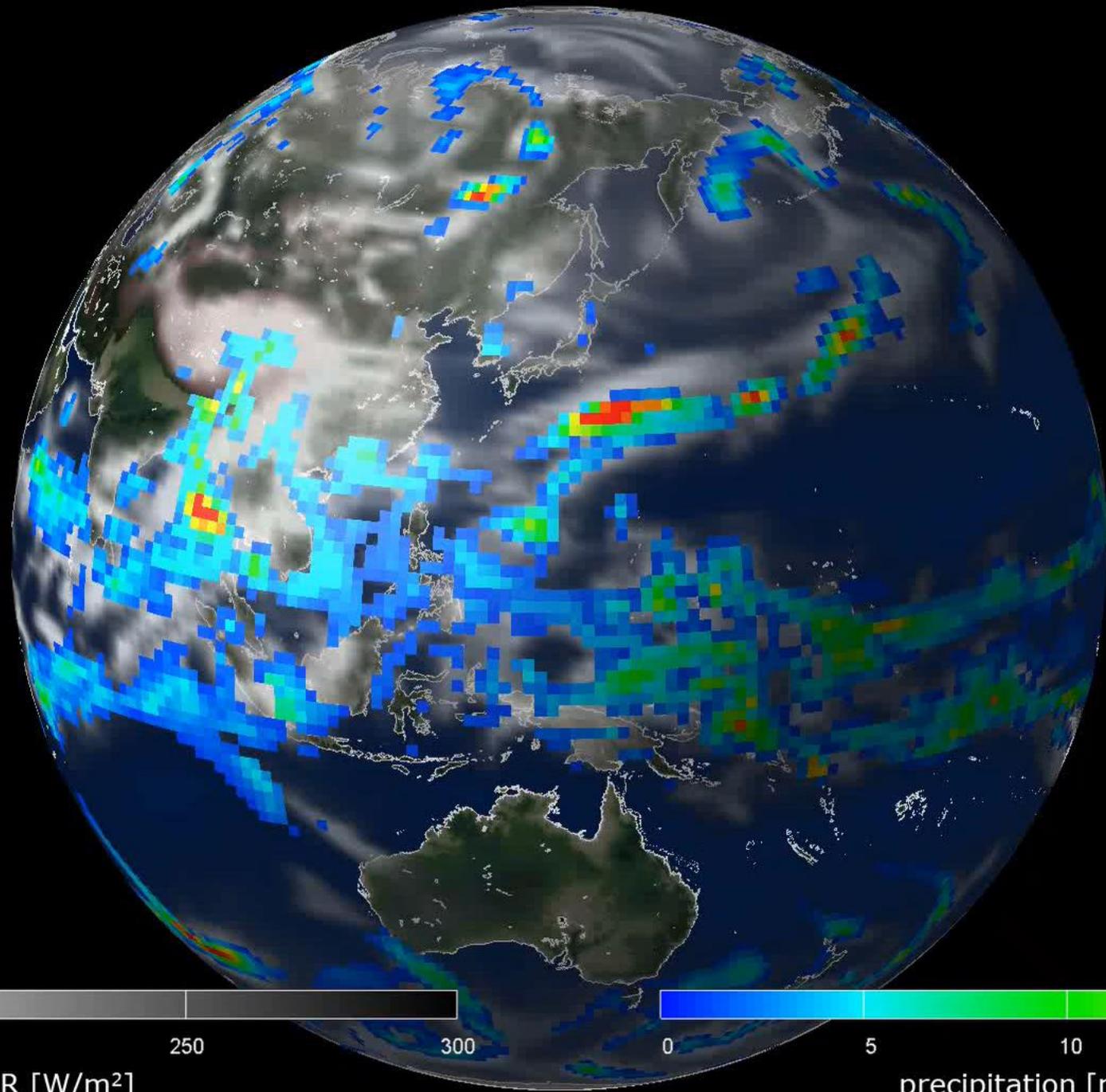
- One ensemble
 - 60yrs
- Initial perturbation
 - 100 for historical/Nat.
 - 15 for future
- Future climate
 - **Global mean temp. +2K, +4K**
- SST/Sea ice
 - Historical
 - COBE2-SST
 - Future
 - **SSTs from CMIP5**



Ishii and Mori (2020) PEPS

d4PDF example

06/10 02:00

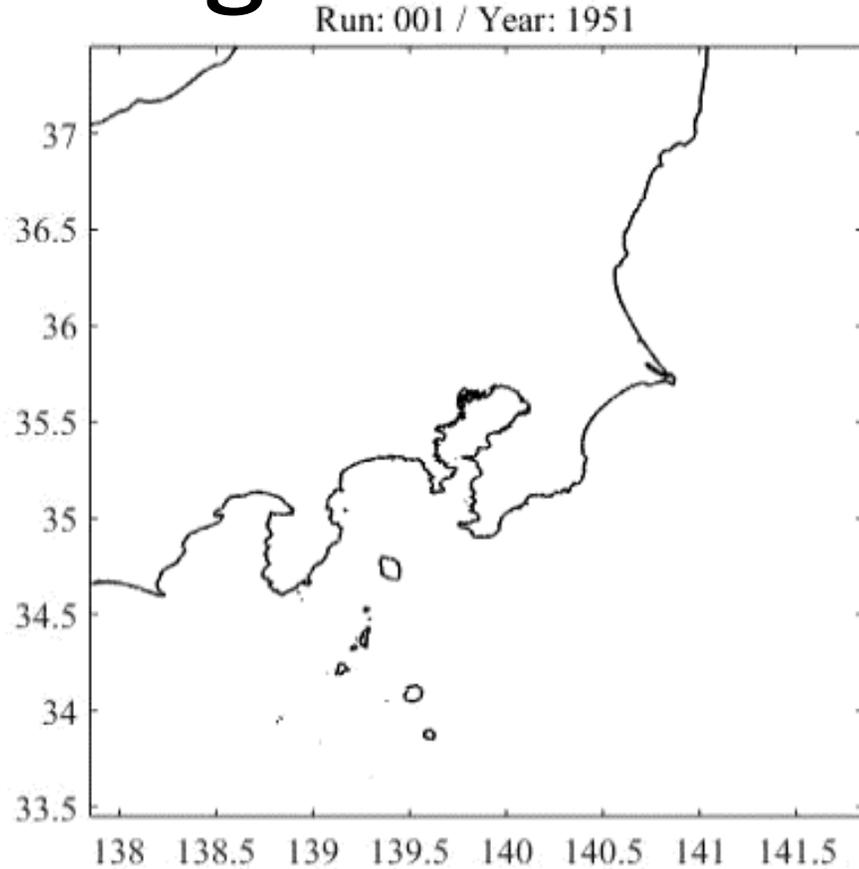


OLR [W/m²]



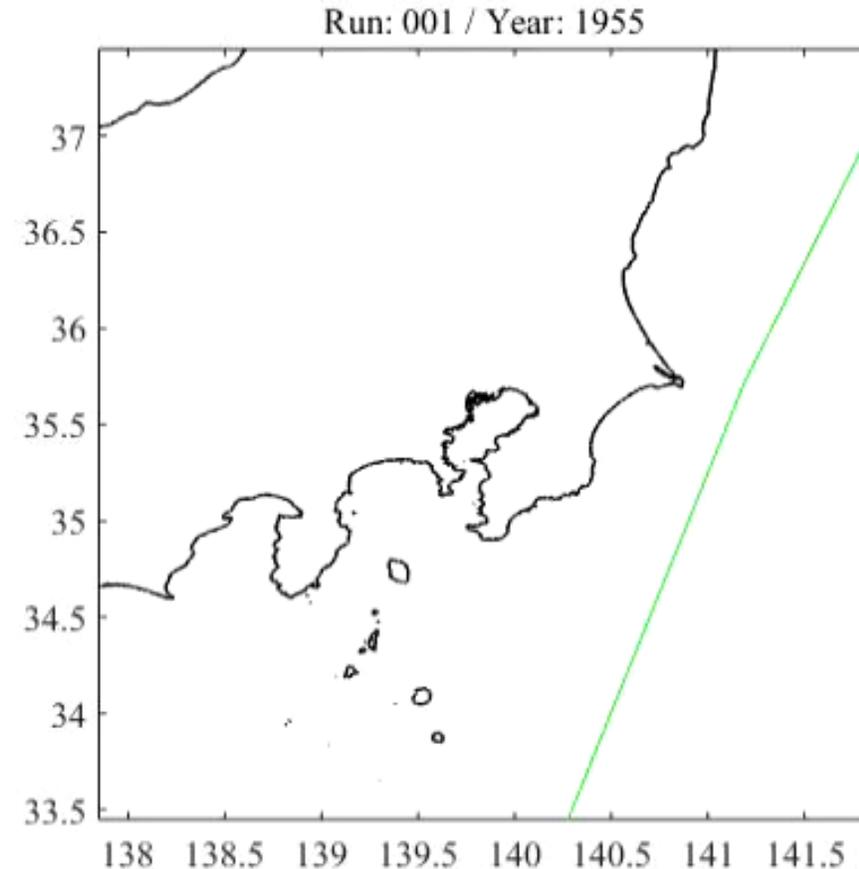
precipitation [mm/6hr]

How large ensemble d4PDF can increase TC?



1 ensemble run
= 60 years

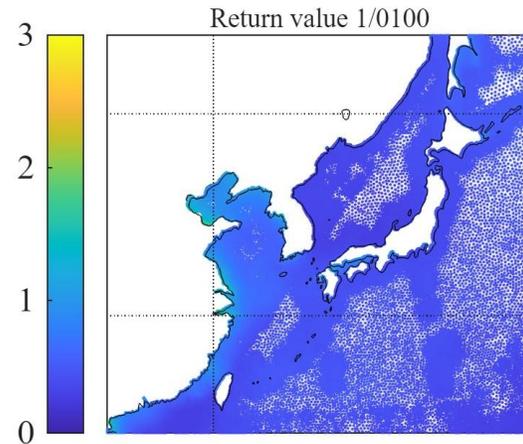
60 years climate run



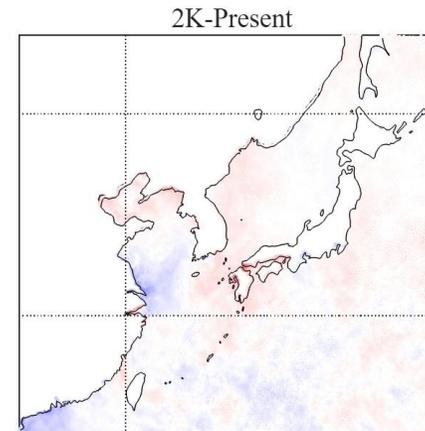
100 ensemble run
= 6000 years

d4PDF (6000 years)

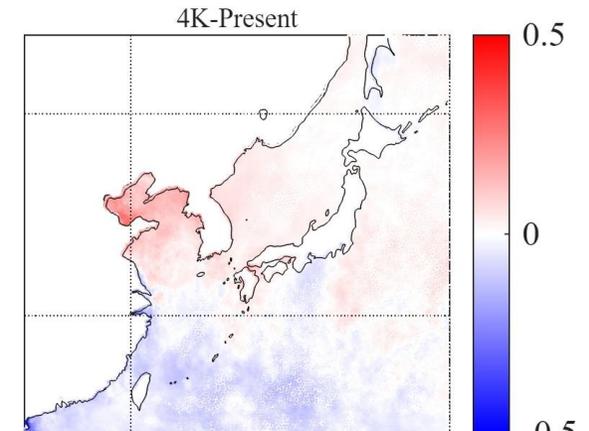
Δ Surge height in +2K/4K: 1/100 years



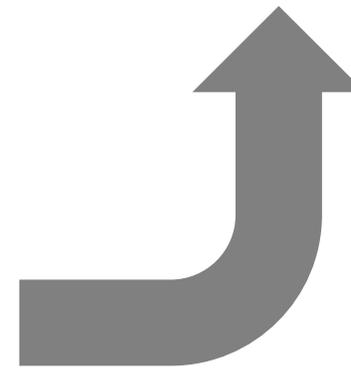
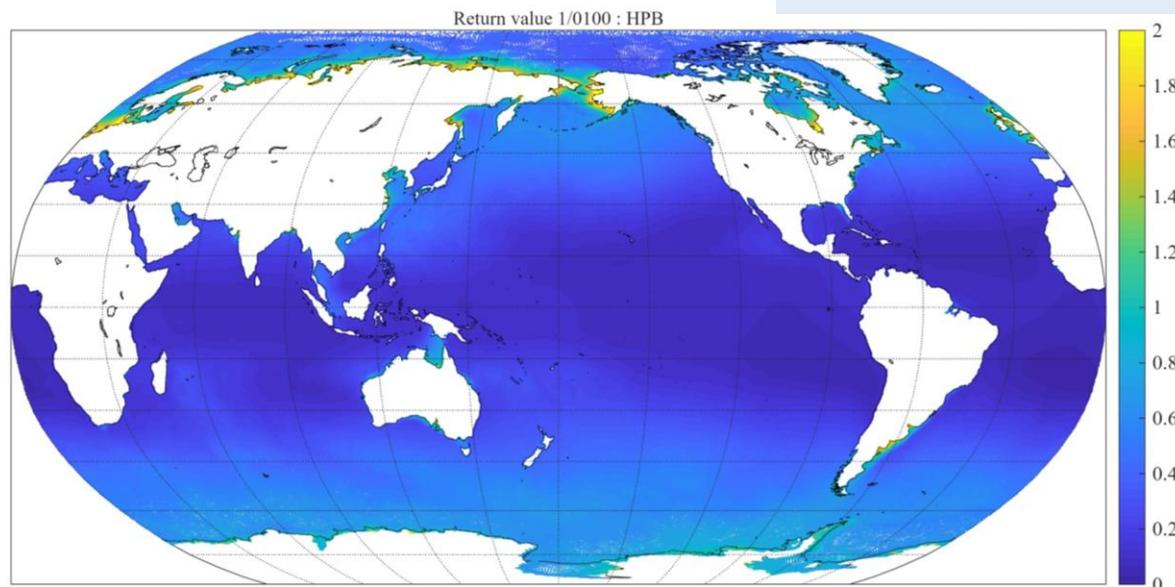
Present climate

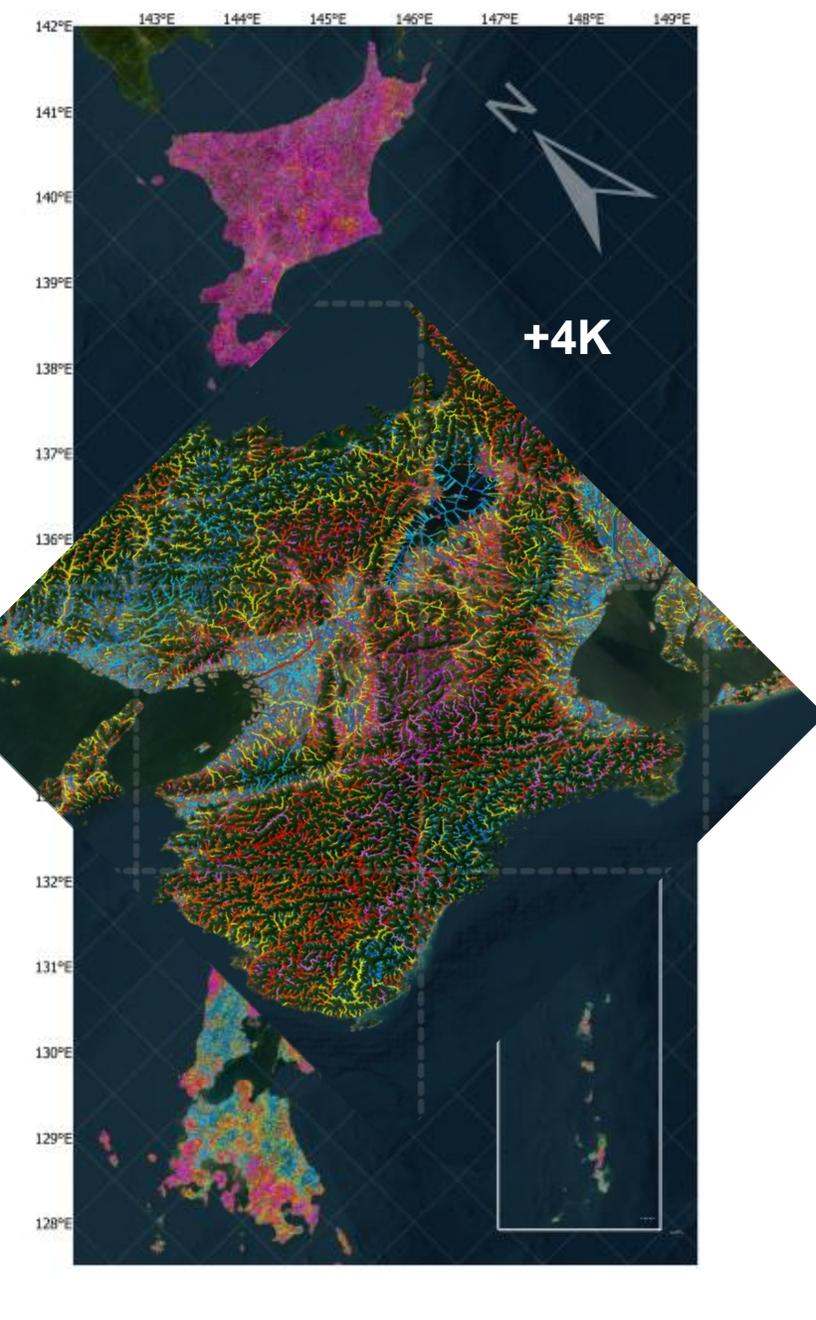
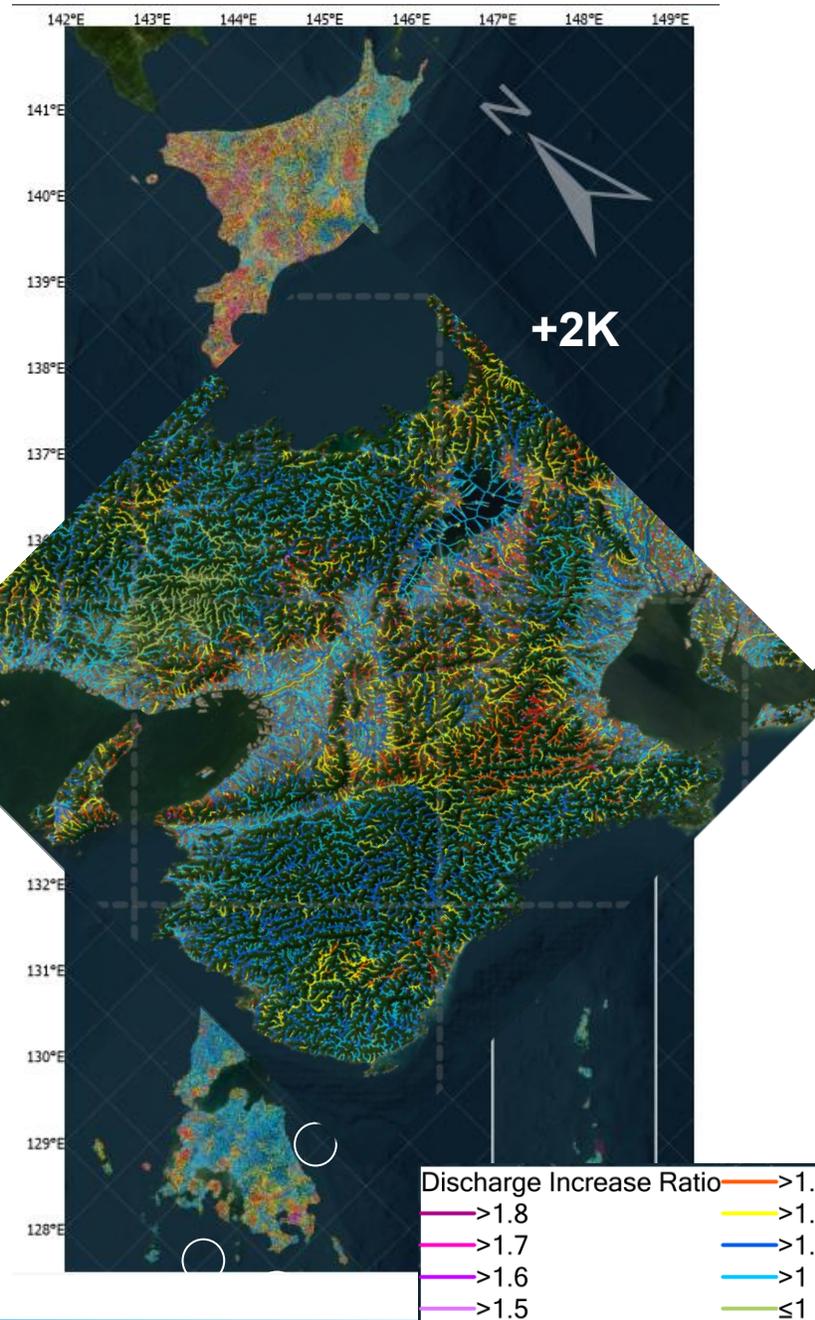
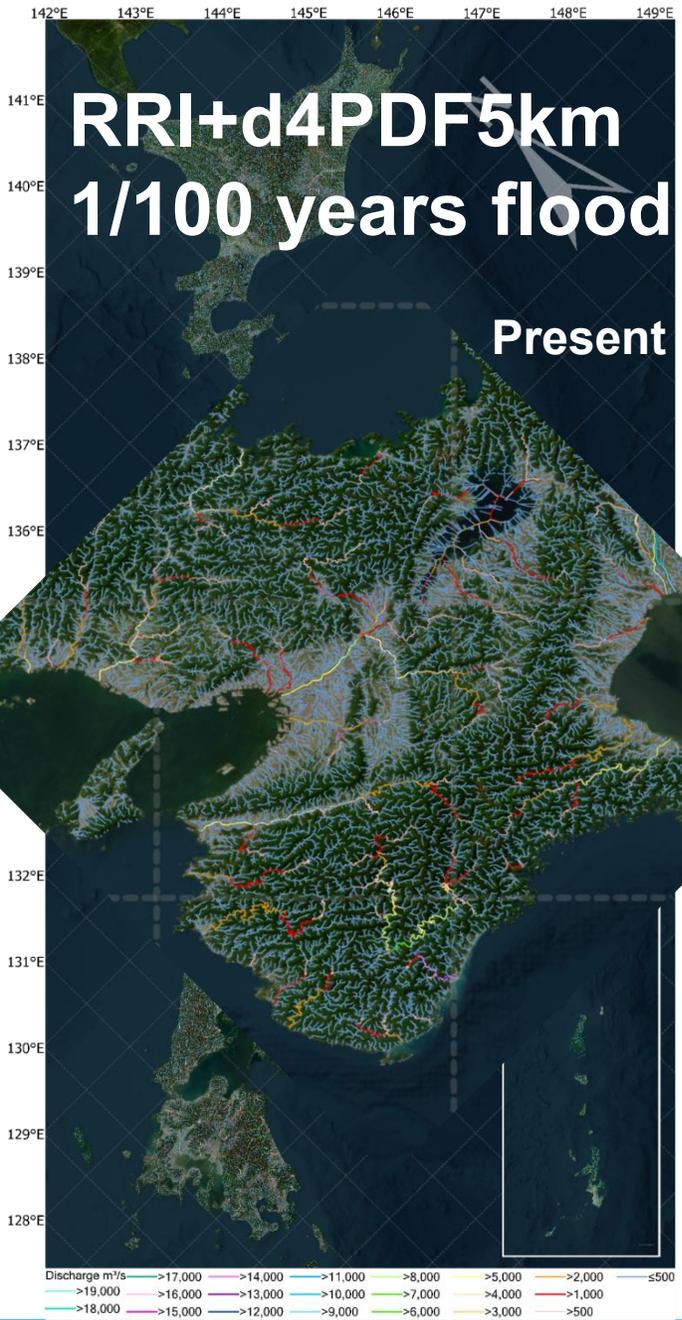


+2K-Present

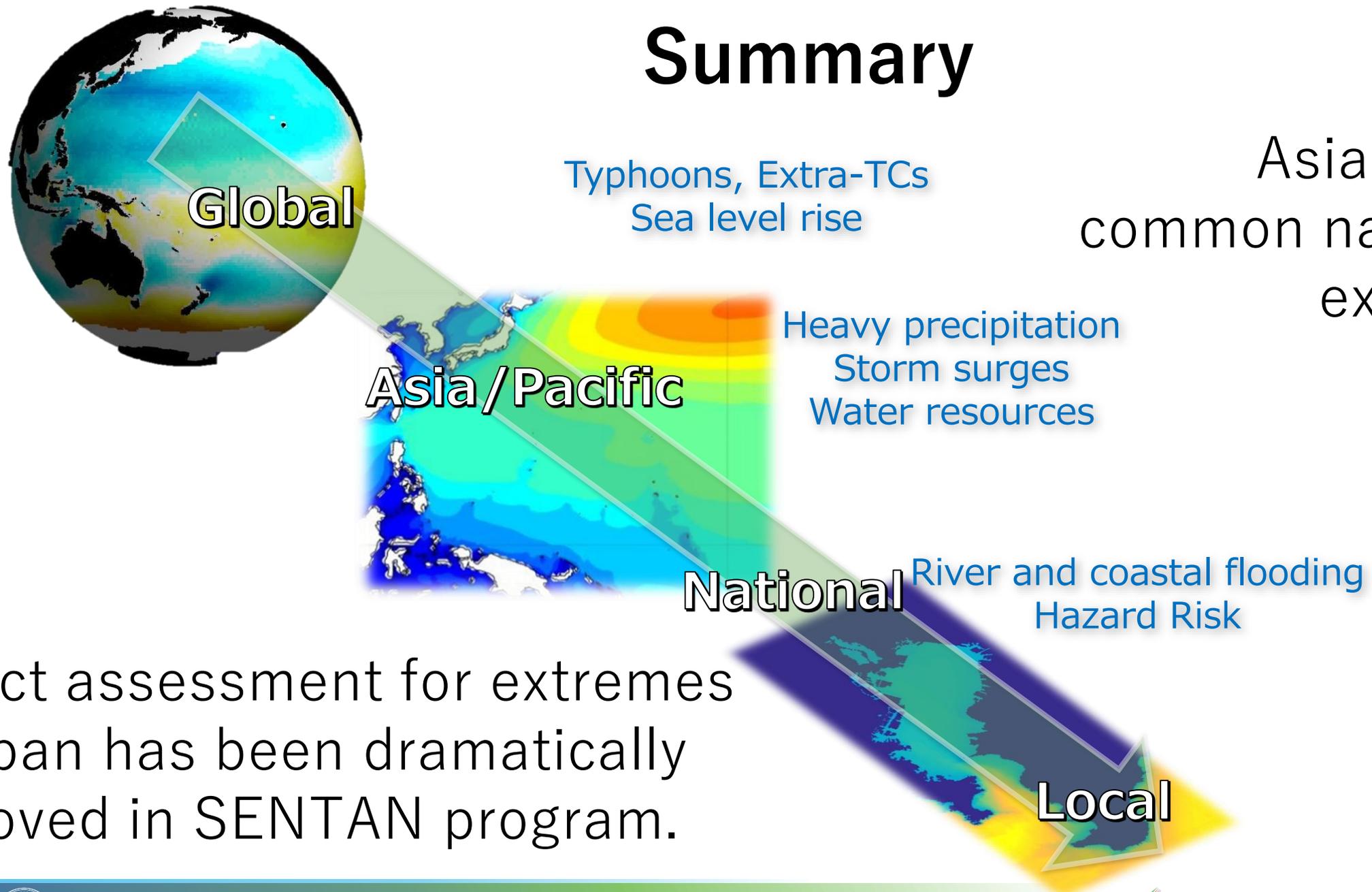


+4K-Present





Summary



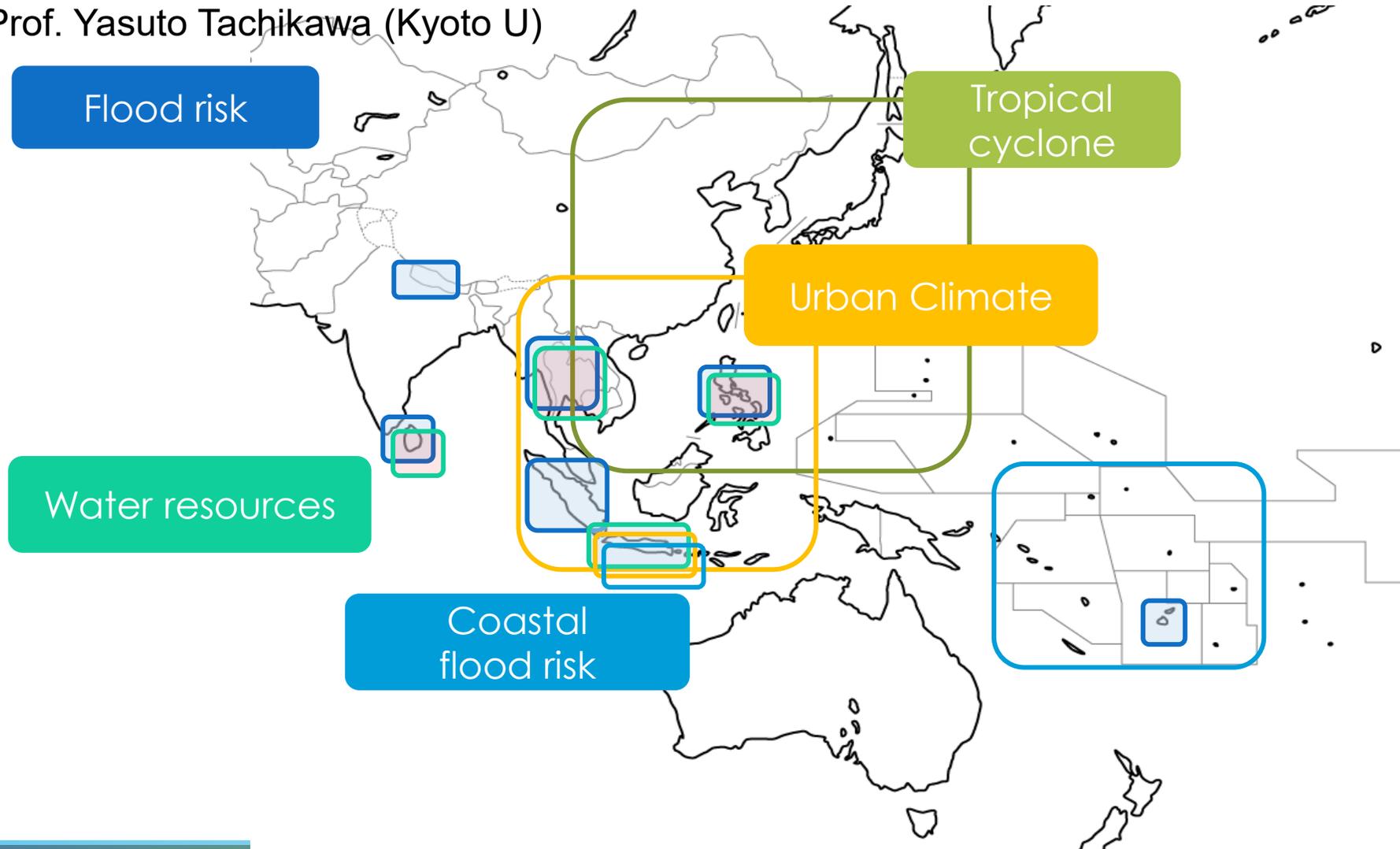
Asia shares common nature of extremes

Impact assessment for extremes in Japan has been dramatically improved in SENTAN program.

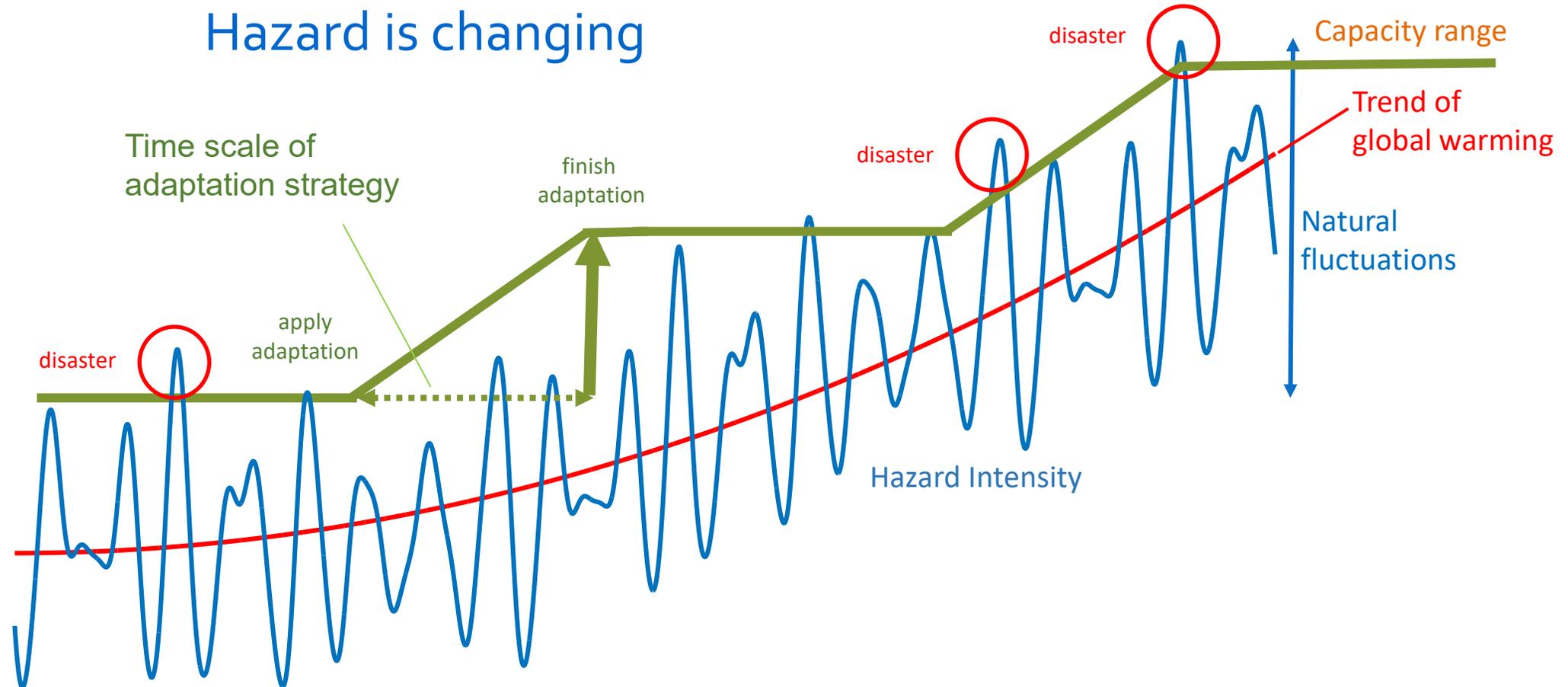
**We are willing to collaborate
any level of research**

Sub-theme iv : International cooperation for hazard and risk assessments in the Asia-Pacific region

Leader: Prof. Yasuto Tachikawa (Kyoto U)



No-regret adaptation strategy for climate change



Mori and Shimura (2023) Cambridge Prisms