A Multi-model Assessment of the Changing Risks of Extreme Rainfall Events in Bangladesh under 1.5 and 2.0 degrees' warmer worlds


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RUKSANA H. RIMI[1,2](rimi_esc@yahoo.com), Karsten Haustein[1], Emily Barbour[1,3], Sarah Sparrow[4], Sihan Li[1,4], David Wallom[4], and Myles Allen[1]

[1]Environmental Change Institute, School of Geography and the Environment, University of Oxford, Oxford, UK
[2]Environmental Science and Resource Management, Mawlana Bhashani Science and Technology University, Santosh, Tangail, Bangladesh
[3]Commonwealth Scientific and Industrial Research Organisation, Land and Water, Canberra, ACT 2601, Australia.
[4]Oxford e-Research Centre, Department of Engineering Science, University of Oxford, Oxford, OX1 3QG, UK.

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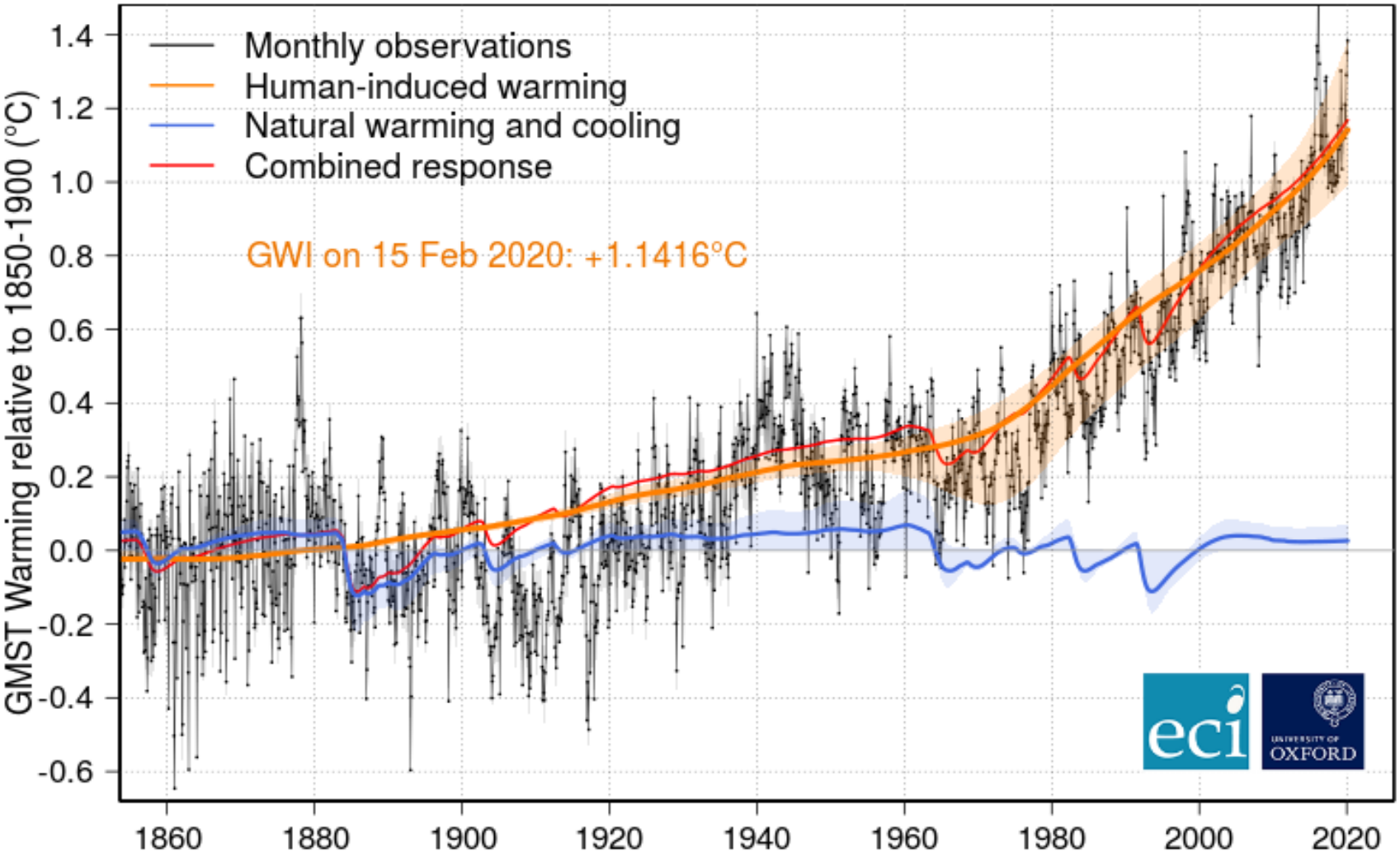
Global Warming Index (aggregate observations) - updated to Feb 2020



globalwarmingindex.org

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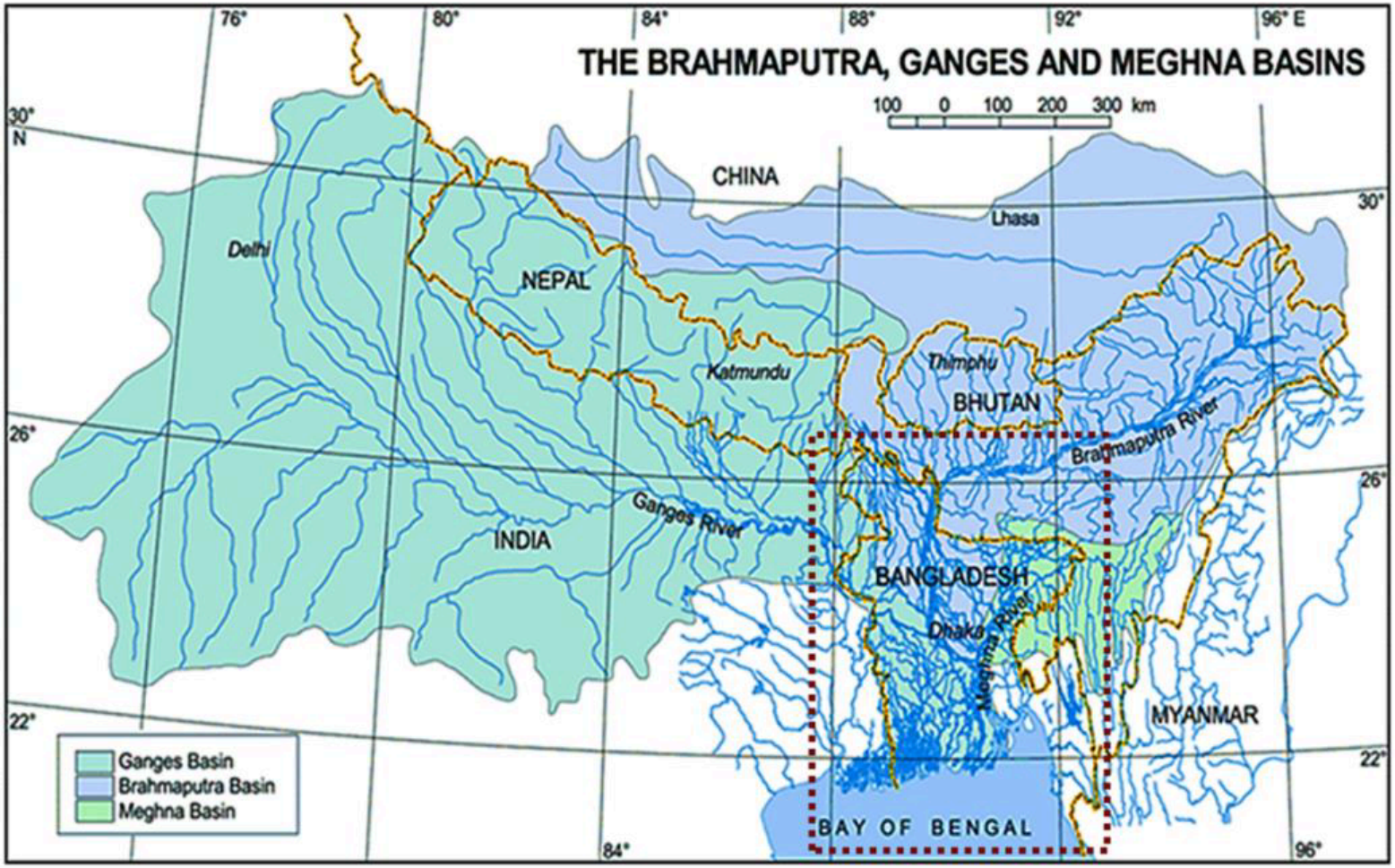

- **Geographical location: downstream country of the GBM basins**
- **Riverine environment: ~700 hundreds of rivers and their tributaries**
- **Physiography: ~ 80% of the land is flat and forms mostly floodplain**

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How would the risks of extreme rainfall events in the pre-monsoon (MAM) and monsoon (JJAS) seasons change across Bangladesh under 1.5 and 2.0 degrees' warmer world conditions?

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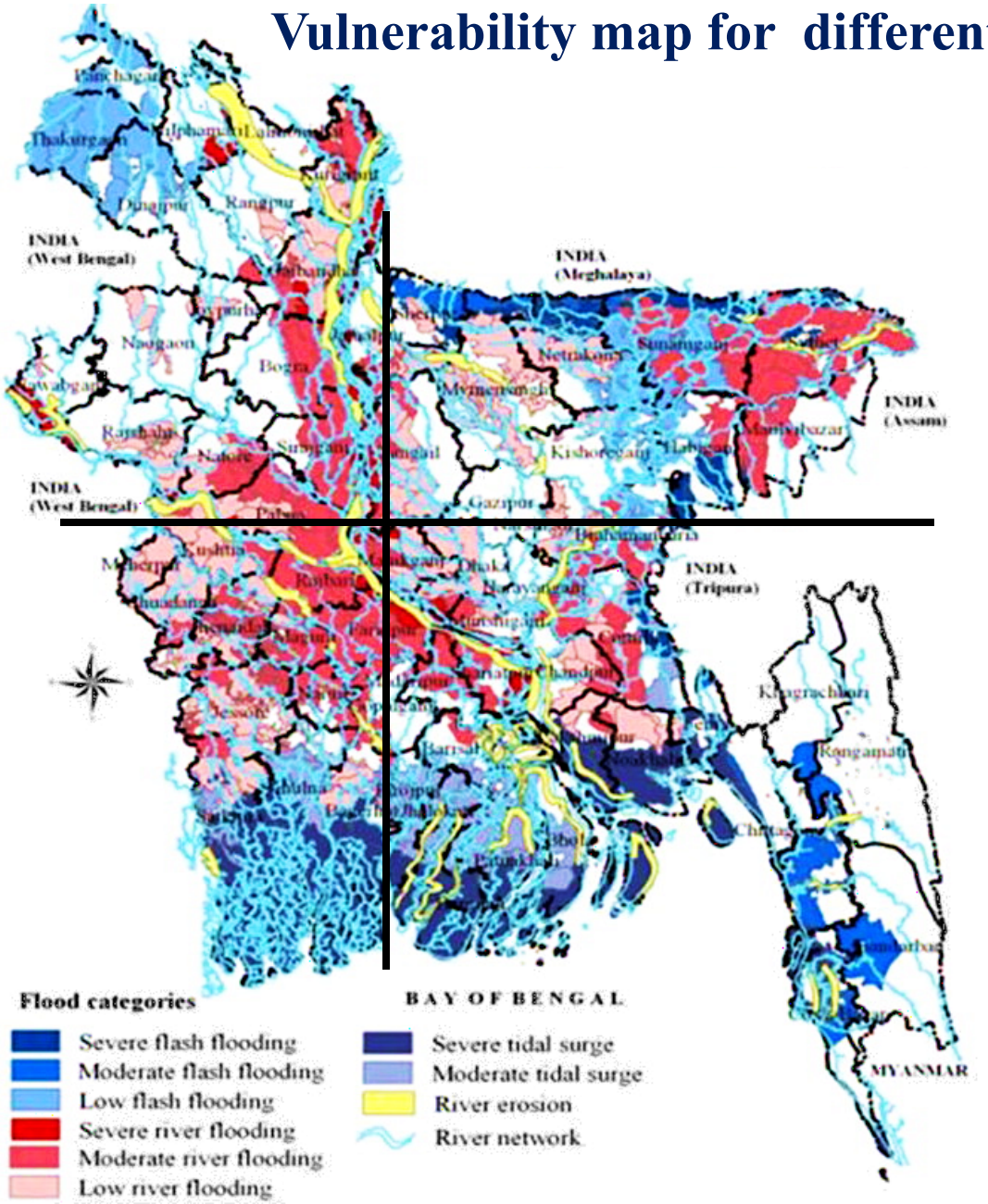
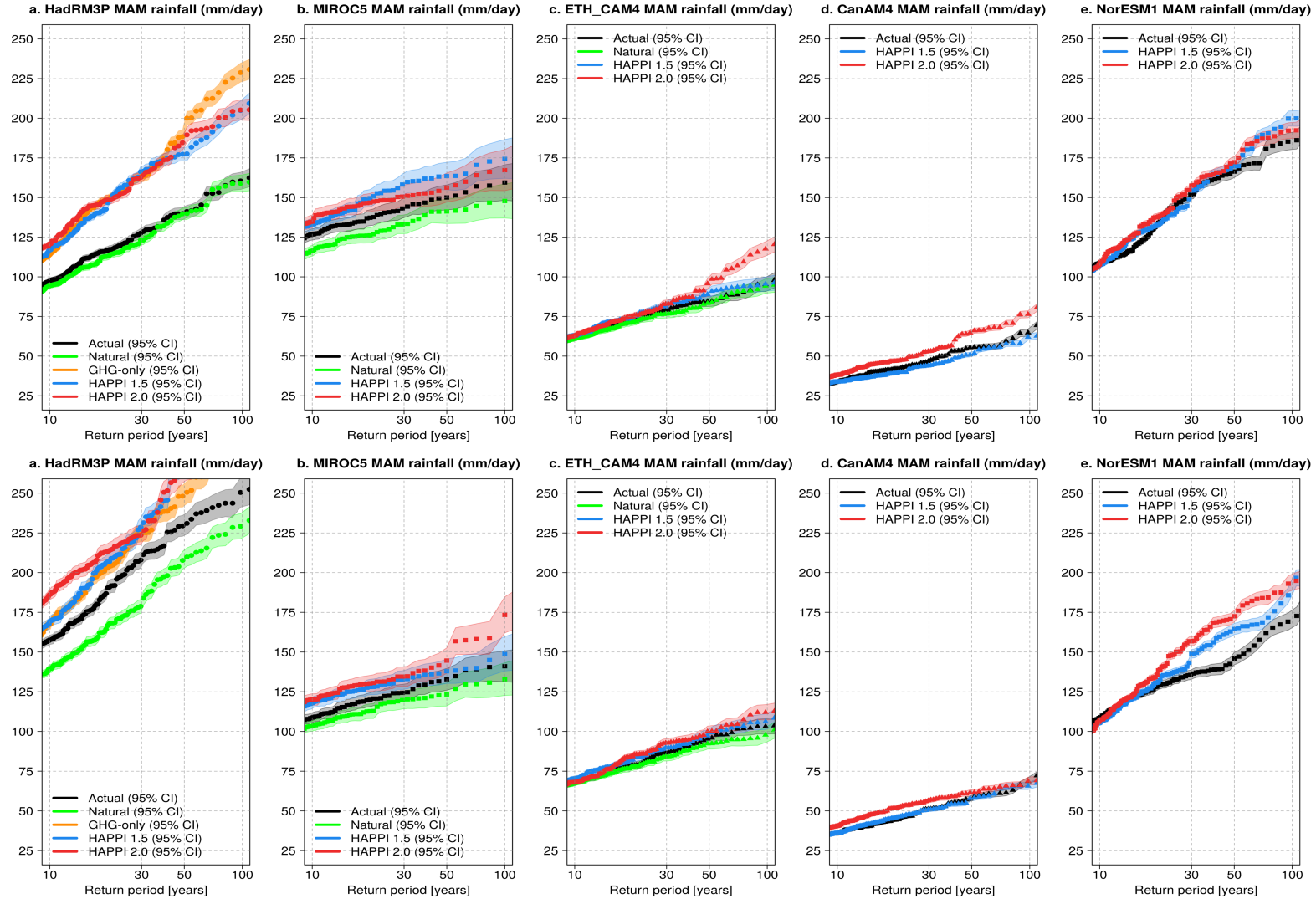
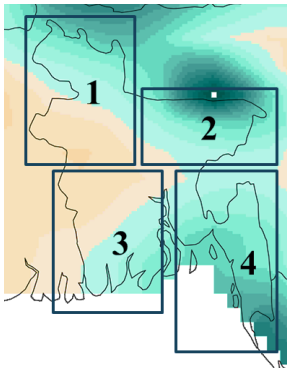
Vulnerability map for different natural hazards (MoEF, 2008)



1. Northwest – Drought or, low flash flood prone
2. Northeast – Severe flash flood or, severe river flood
3. Southwest – Tidal surges or, low to severe river floods
4. Southwest – Moderate flash floods



1. Northwest Bangladesh



2. Northeast Bangladesh

Figure: Comparative return periods of MAM daily rainfall (mm/day) during 1986-2015 as per (a) HadRM3P, (b) MIROC5, (c) ETH_CAM4, (d) CanAM4 and (e) NorESM1 models. ACT, NAT, GHG-only, plus 1.5°C and 2.0°C model ensembles are shown in black, green, orange, blue and red colours respectively (for more see Rimi et al., 2018, HESSD, doi:10.5194/hess-2018-400).

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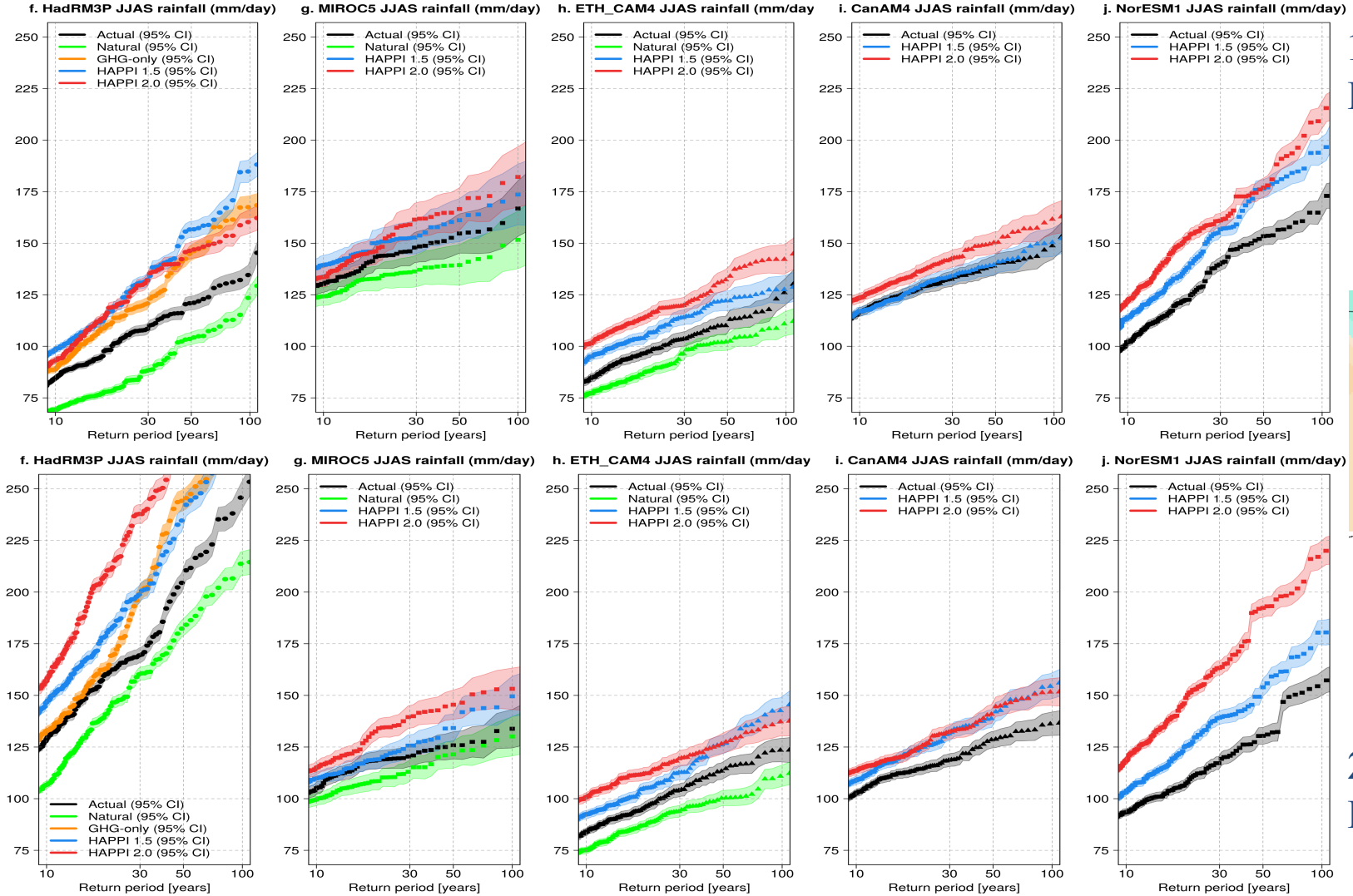
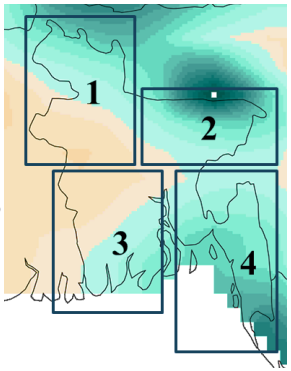


1. Northwest Bangladesh



2. Northeast Bangladesh

Comparative return periods of JJAS daily rainfall (mm/day) during 1986-2015 as per (a) HadRM3P, (b) MIROC5, (c) ETH_CAM4, (d) CanAM4 and (e) NorESM1 models. ACT, NAT, GHG-only, plus 1.5°C and 2.0°C model ensembles are shown in black, green, orange, blue and red colours respectively (for more see Rimi et al., 2018, HESSD, doi:10.5194/hess-2018-400

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Key Messages

- **Human influence on climate is already increasing the risks of extreme rainfall events in Bangladesh**

- **Reaching 1.5 and 2.0 degrees' warmer world would mean experiencing further increase in the risks**

- **Nature and severity of the impacts would depend on both GHGs and anthropogenic aerosols**

- **Policy-makers need to step up to avoid such impacts that would be beyond adaptation capacity**


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