Monitoring Climatic Extremes over Global Land Areas with GHCNDEX

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NOAA's National Climatic Data Center

What is GHCNDEX?

- An operationally updated dataset of climate extremes over global land areas
- Derived from NCDC's Global Historical Climatology Network – Daily database
- The result of collaboration between NCDC and the University of New South Wales
- Includes:
  - Suite of 26 climate indices, each calculated for GHCN-Daily stations with sufficient data
  - Gridded fields of these indices for 1951-present

Indices

- Recommended by WMO Expert Team on Climate Change Detection and Indices
- 16 temperature and 10 precipitation indices
- Some annual, others monthly and annual
- Varying data requirements

Example Temperature Indices

- **Intensity**
  - TXx = highest daily maximum temperature of the month/year
  - TNn = lowest daily minimum temperature of the month/year
- **Frequency**
  - TX90p = percentage of "warm" days in the month/year
- **Duration**
  - WSDI = warm spell duration indicator

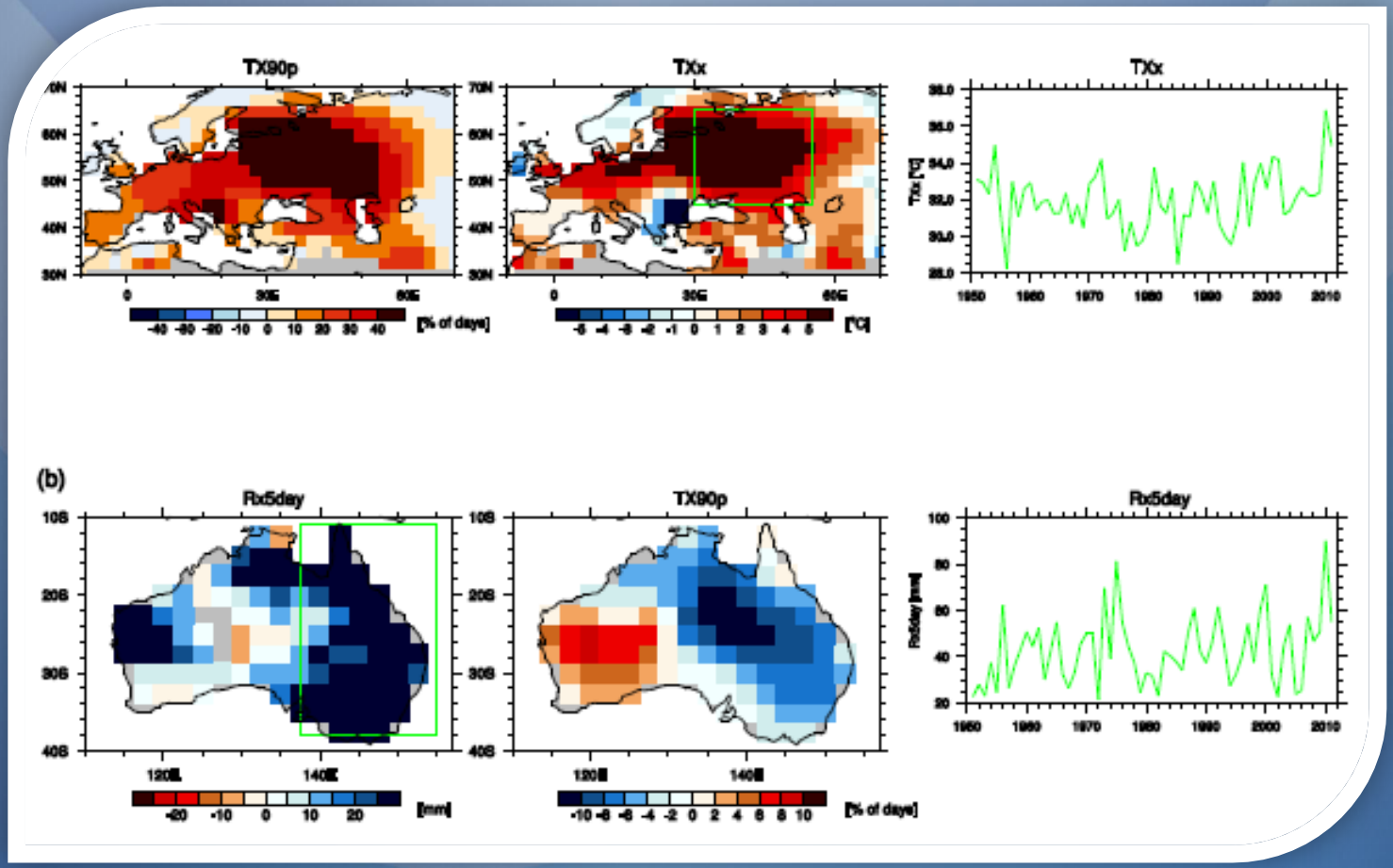
Example Precipitation Indices

- Intensity
  - Rx1day = maximum 1-day total for the month/year
  - R95p = contribution from very wet days to annual total
- Frequency
  - R10mm = heavy precipitation days
- Duration
  - CDD = consecutive dry days

Gridding

- 2.5° by 2.5° latitude/longitude grid over global land areas
- Based on stations with ≥40 years of data since 1951
- Created using a modified version of Shepard's angular distance weighting algorithm
- Takes into account the decorrelation length scale of each index

Recent Climatic Events



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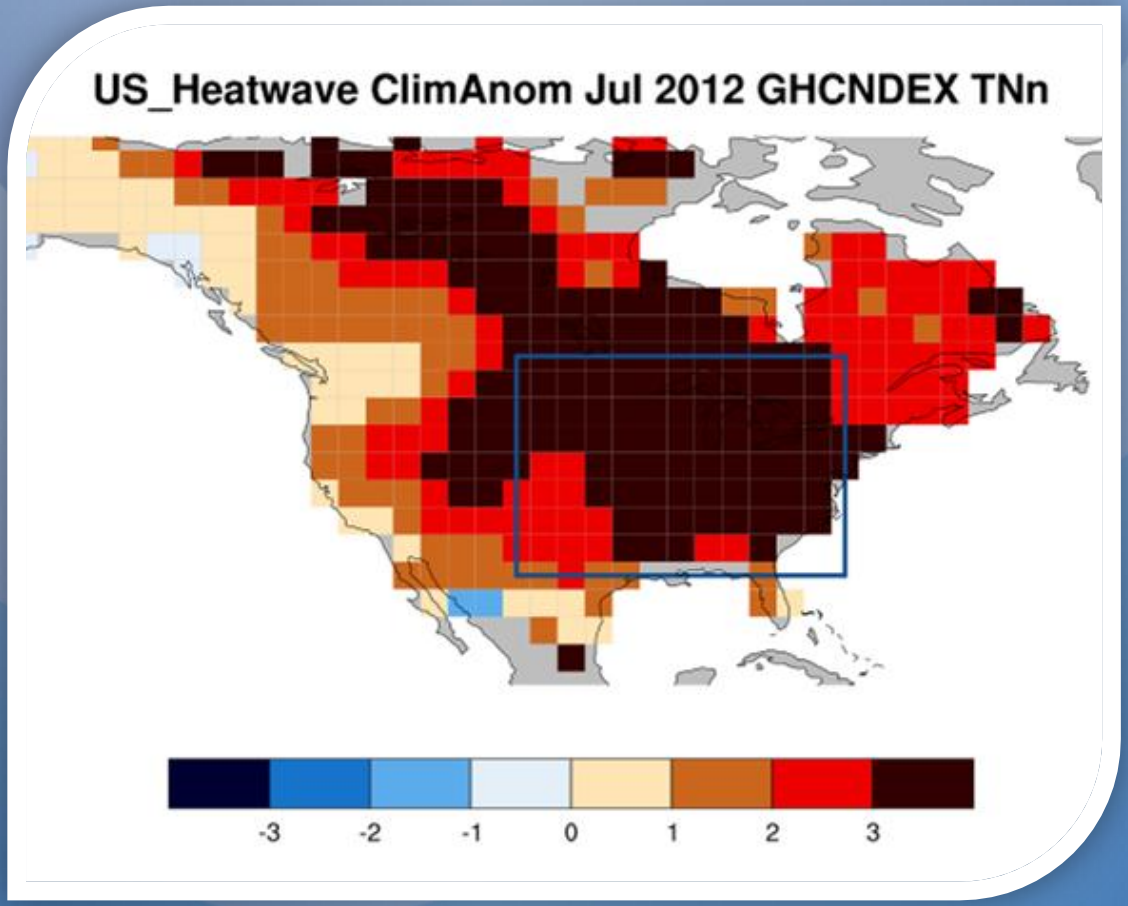

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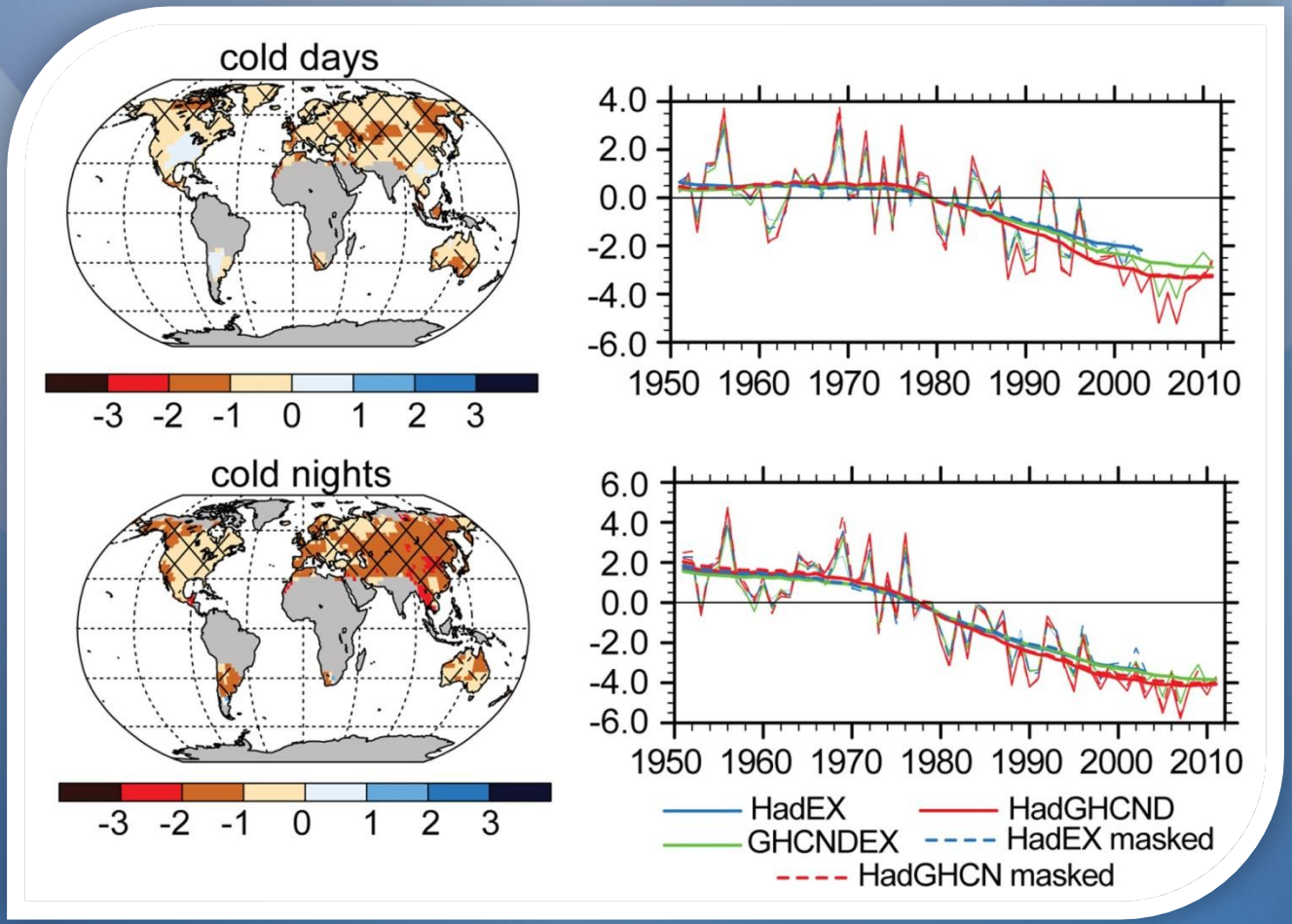
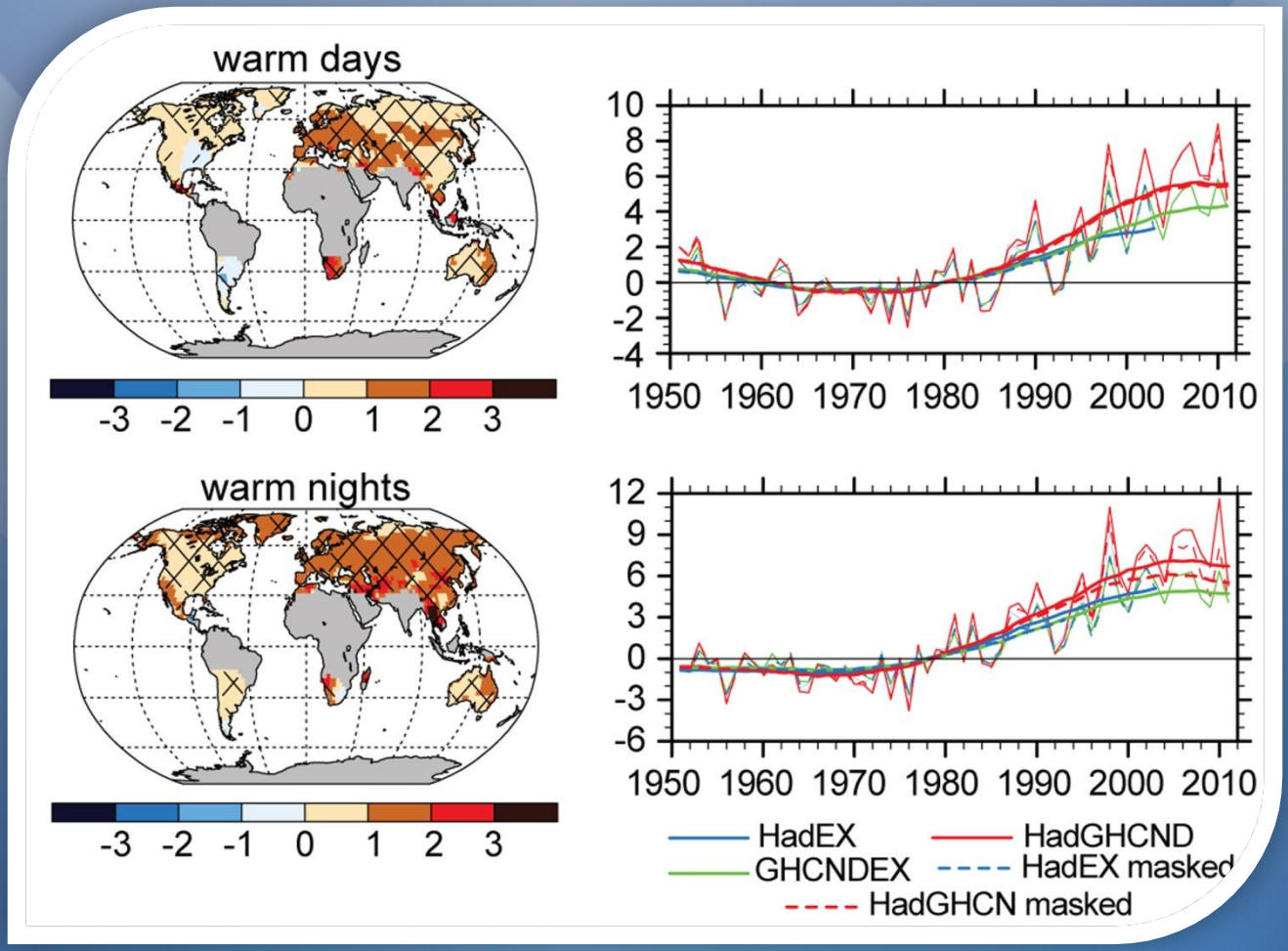
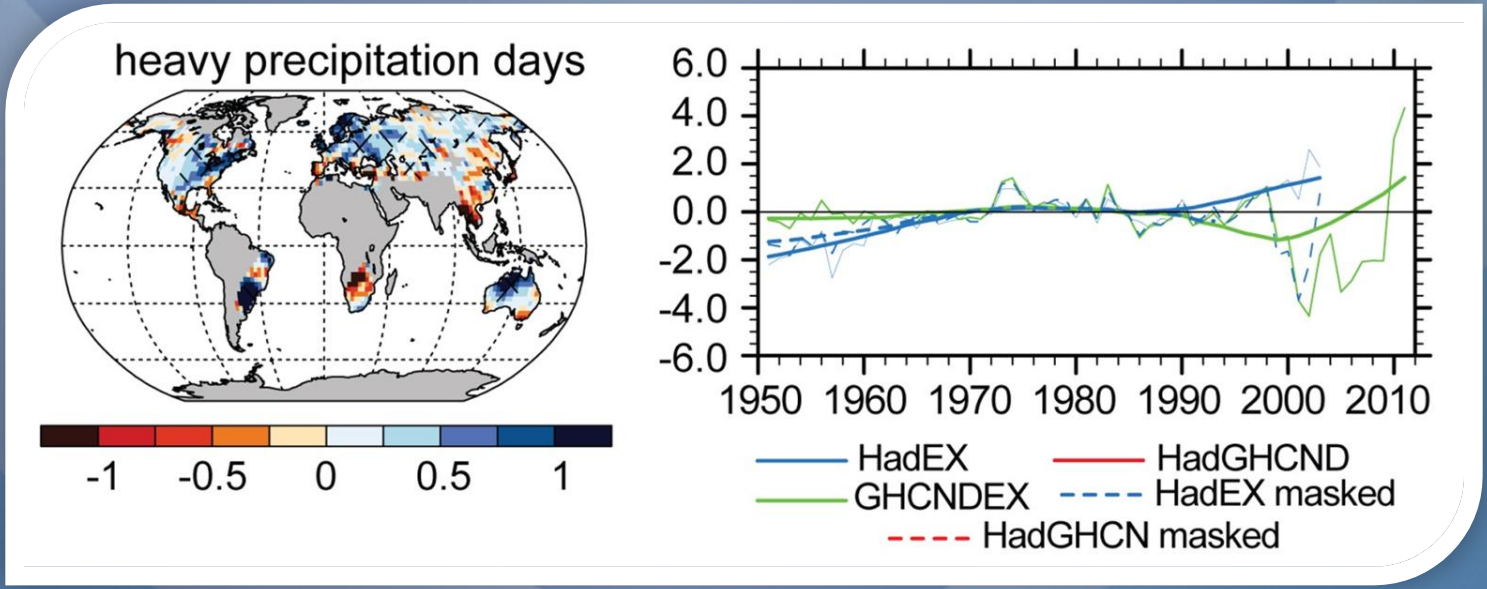
Trends in Cold Events



Trends in Warm Events



Trends in Heavy Precip.



For More Information

- http://www.climdex.org
- Contact:
  - Imke.Durre@noaa.gov
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- Manuscript under review
  - Donat, M.G., et al., 2012: Global land-based datasets for monitoring climatic extremes. (Submitted to BAMS)


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