

Past success and future expectations

ETCCDI work planning/review

Paris July 6-8, 2015

ETCCDI

- Jointly sponsored by CCI, WCRP and JCOMM
- Membership:
 - WCRP (CLIVAR, GEWEX), 6 members
 - CCI, 6 members
 - JCOMM currently 3 members
- Contributions:
 - Science, data products, research, IPCC assessments
 - Service: capacity building, workshops, software, indices data

Indices as important basis for research on climate extremes

- Internationally coordinated, software provided
- Simple, straight forward, reliable, and consistent across different regions
- Frequency, amplitude, persistence of extreme events
- For both observations and model simulations
- Used in
 - Trend analysis
 - Detection and attribution
 - Projection

Contribution to Science

ETCCDI indices related work forms the core of knowledge on the changes in climate extremes assessed by the AR5 WGI

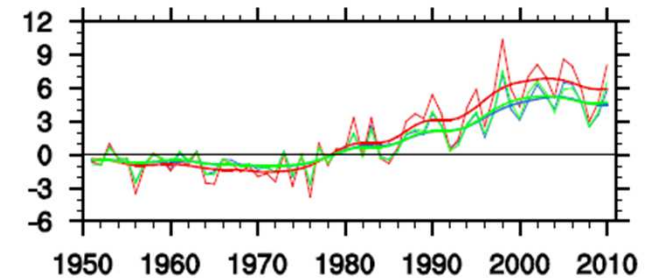
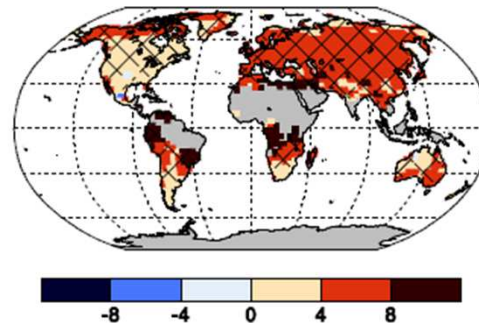
Box 2.4, Table 1 | Definitions of extreme temperature and precipitation indices used in IPCC (after Zhang et al., 2011). The most common units are shown but these may be shown as normalized or relative depending on application in different chapters.

Index	Descriptive name	Definition	Units	Figures/Tables	Section
TXx	Warmest daily Tmax	Seasonal/annual maximum value of daily maximum temperature	°C	Box 2.4, Figure 1, Figures 9.37, 10.17, 12.13	Box 2.4, 9.5.4.1, 10.6.1.1, 12.4.3.3
TNx	Warmest daily Tmin	Seasonal/annual maximum value of daily minimum temperature	°C	Figures 9.37, 10.17	9.5.4.1, 10.6.1.1
TXn	Coldest daily Tmax	Seasonal/annual minimum value of daily maximum temperature	°C	Figures 9.37, 10.17, 12.13	9.5.4.1, 10.6.1.1, 12.4.3.3
TNn	Coldest daily Tmin	Seasonal/annual minimum value of daily minimum temperature	°C	Figures 9.37, 10.17, 12.13	9.5.4.1, 10.6.1.1
TN10p	Cold nights	Days (or fraction of time) when daily minimum temperature <10th percentile	Days (%)	Figures 2.32, 9.37, 10.17 Tables 2.11, 2.12	2.6.1, 9.5.4.1, 10.6.1.1, 11.3.2.5.1
TX10p	Cold days	Days (or fraction of time) when daily maximum temperature <10th percentile	Days (%)	Figures 2.32, 9.37, 10.17, 11.17	2.6.1, 9.5.4.1, 10.6.1.1, 11.3.2.5.1,
TN90p	Warm nights	Days (or fraction of time) when daily minimum temperature >90th percentile	Days (%)	Figures 2.32, 9.37, 10.17 Tables 2.11, 2.12	2.6.1, 9.5.4.1, 10.6.1.1, 11.3.2.5.1
TX90p	Warm days	Days (or fraction of time) when daily maximum temperature >90th percentile	Days (%)	Figures 2.32, 9.37, 10.17, 11.17 Tables 2.11, 2.12	2.6.1, 9.5.4.1, 10.6.1.1, 11.3.2.5.1,
FD	Frost days	Frequency of daily minimum temperature <0°C	Days	Figures 9.37, 12.13 Table 2.12	2.6.1, 9.5.4.1, 10.6.1.1, 12.4.3.3
TR	Tropical nights	Frequency of daily minimum temperature >20°C	Days	Figures 9.37, 12.13	9.5.4.1, 12.4.3.3
RX1day	Wettest day	Maximum 1-day precipitation	mm	Figures 9.37, 10.10 Table 2.12, 12.27	2.6.2.1, 9.5.4.1, 10.6.1.2, 12.4.5.5
RX5day	Wettest consecutive five days	Maximum of consecutive 5-day precipitation	mm	Figures 9.37, 12.26, 14.1	9.5.4.1, 10.6.1.2, 12.4.5.5, 14.2.1
SDII	Simple daily intensity index	Ratio of annual total precipitation to the number of wet days (≥ 1 mm)	mm day ⁻¹	Figures 2.33, 9.37, 14.1	2.6.2.1, 9.5.4.1, 14.2.1
R95p	Precipitation from very wet days	Amount of precipitation from days >95th percentile	mm	Figures 2.33, 9.37, 11.17 Table 2.12	2.6.2.1, 9.5.4.1, 11.3.2.5.1
CDD	Consecutive dry days	Maximum number of consecutive days when precipitation <1 mm	Days	Figures 2.33, 9.37, 12.26, 14.1	2.6.2.3, 9.5.4.1, 12.4.5.5, 14.2.1

Indices Data: Observations

- HadEX2 released
- Better coverage than HadEX
- Workshop data being ingested
- Data paper published
- A separate datasets based on GHCN data offer near real time update for monitoring

(c) warm nights



(d) warm days

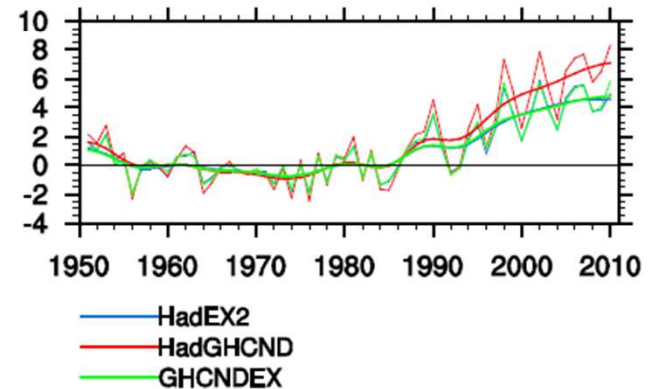
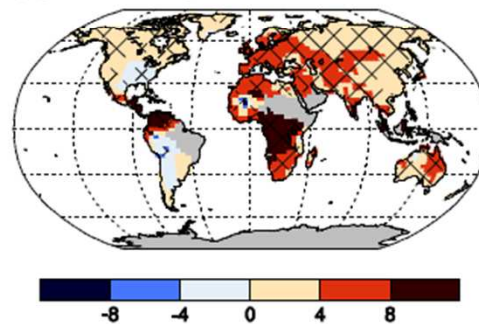
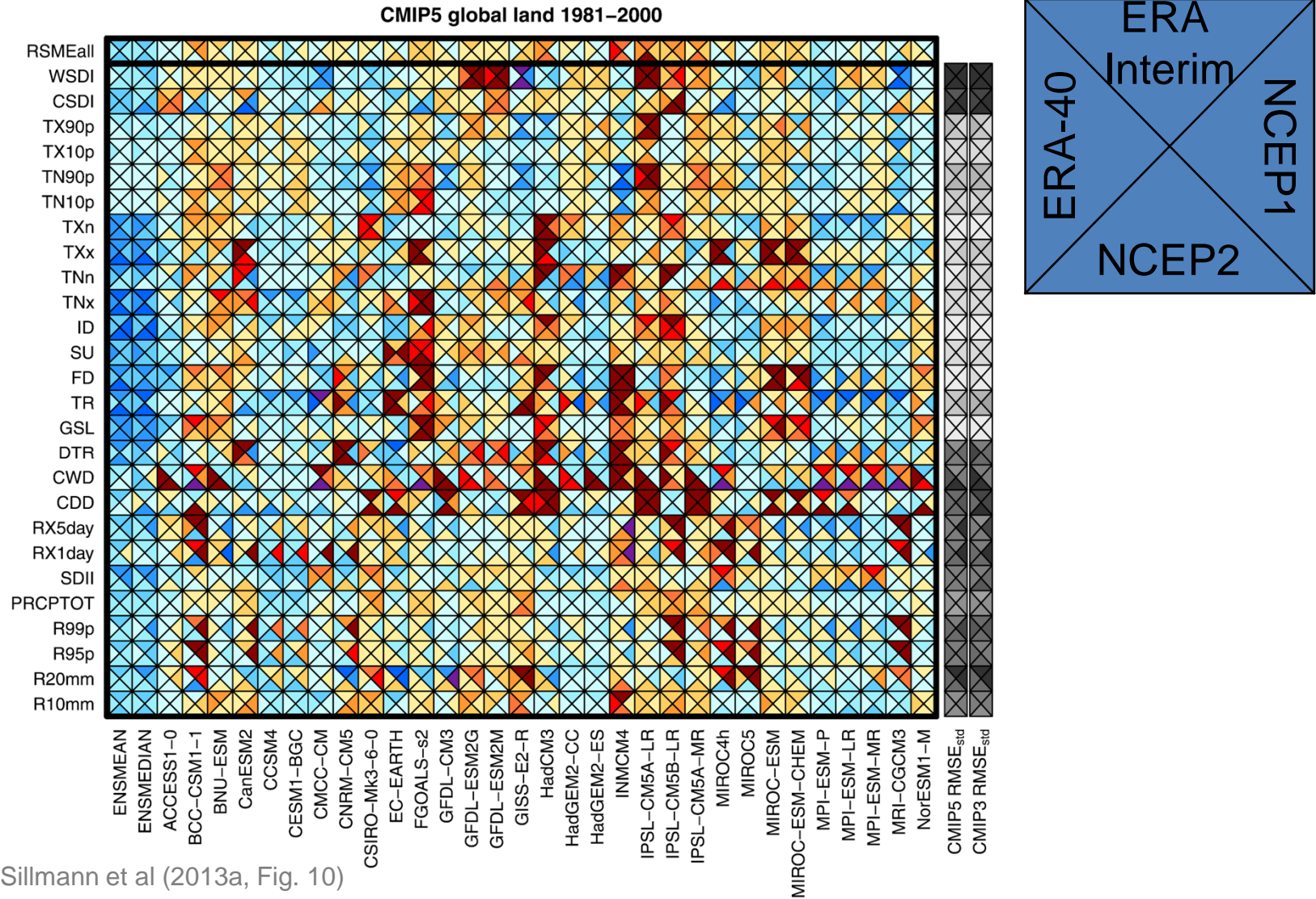


Figure 2.41: Maps show observed trends (days per decade) in the frequency of extreme temperatures, over the period 1951 to 2010, for: (a) cool nights (10th percentile), (b) cool days (10th percentile), (c) warm nights (90th percentile) and (d) warm days (90th percentile). Trends were calculated only for grid boxes that had at least 30 years of data during this

Donat et al. 2013

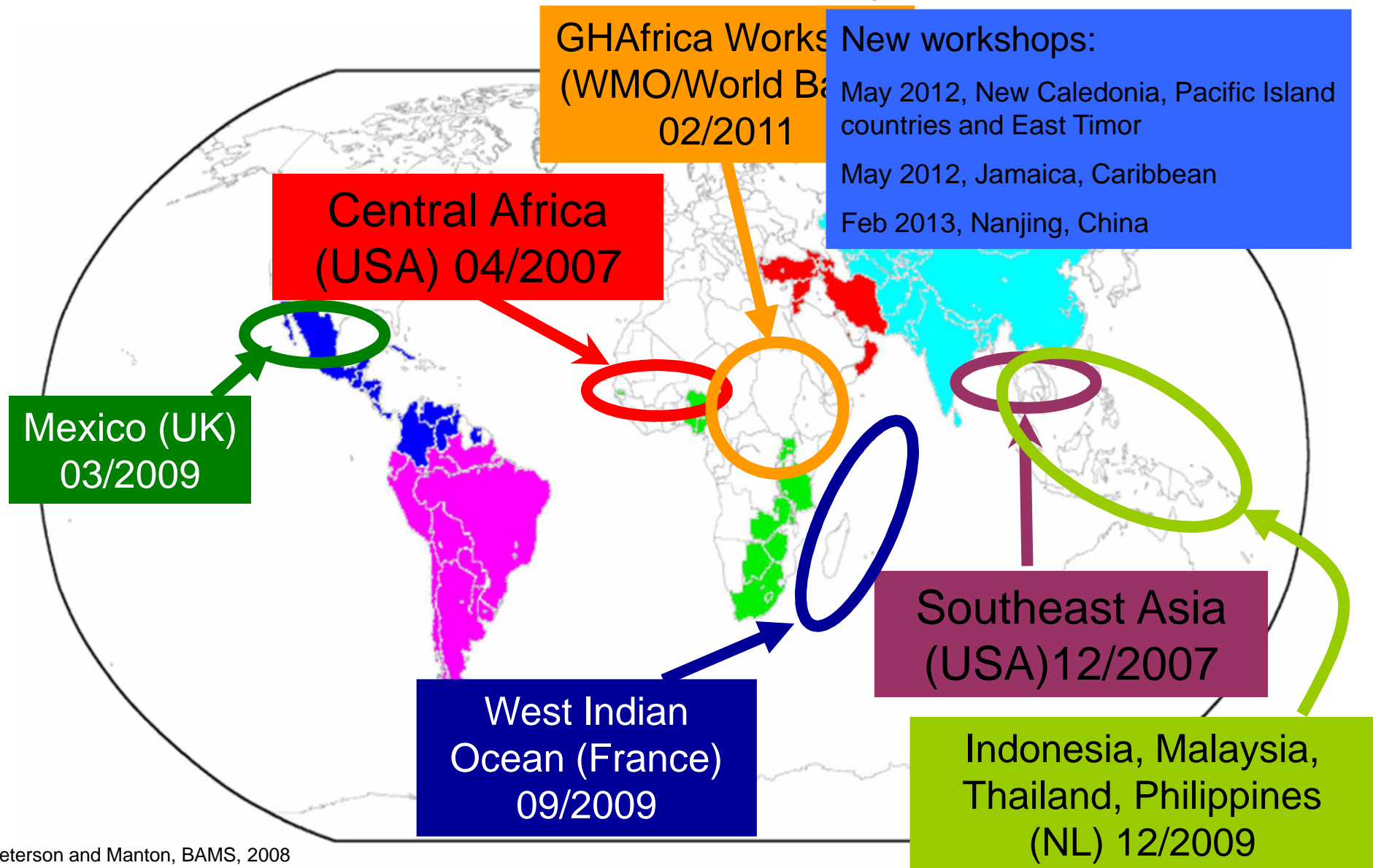
Overall evaluation of indices



Contribution to Service: Capacity building

- Development and provision of software (RClimDex, RHtest)
- Development and provision of indices data (HadEXx, CMIP model data)
- Workshops:
 - Free software + hands-on training + post workshop follow-ups
 - build capacity to analyze observed changes in extremes
 - improve information services on extremes
 - publish peer-reviewed papers from each workshop
 - contribute to worldwide database of derived indices
 - Supported by various funders
 - Workshop papers done in time for TAR, AR4 and SREX, and AR5 as well

WMO ETCCDI Workshops 2002-2013 (complemented by APN)



Connections

- WCRP Grand Challenges (Extremes, sea level, CLIVAR, GEWEX)
 - Leadership role for extreme GC
- CCI Expert Team/task forces on climate monitoring, data rescue, sector specific indices (water resources and agriculture)
- JCOMM: ICOADS, COWCLIP, ETWCH
- IDAG: detection and attribution

Future expectations

- Need to keep old good work
 - Update indices for observations and CMIP6 data
- New ocean-related indices including software
- New runoff related indices
- Use of remotely sensed data
- Leadership and contributions to WCRP GCs