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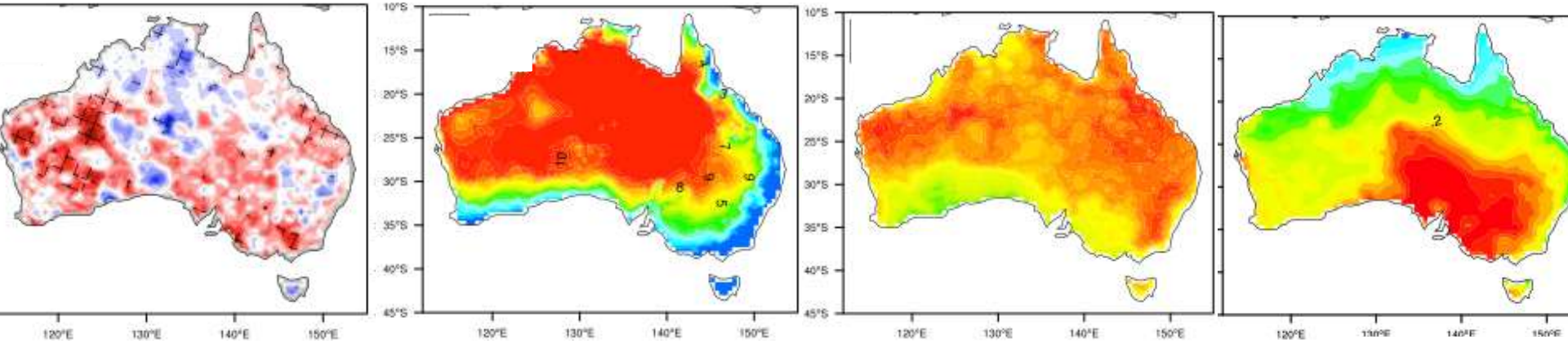

Global heatwaves and data issues

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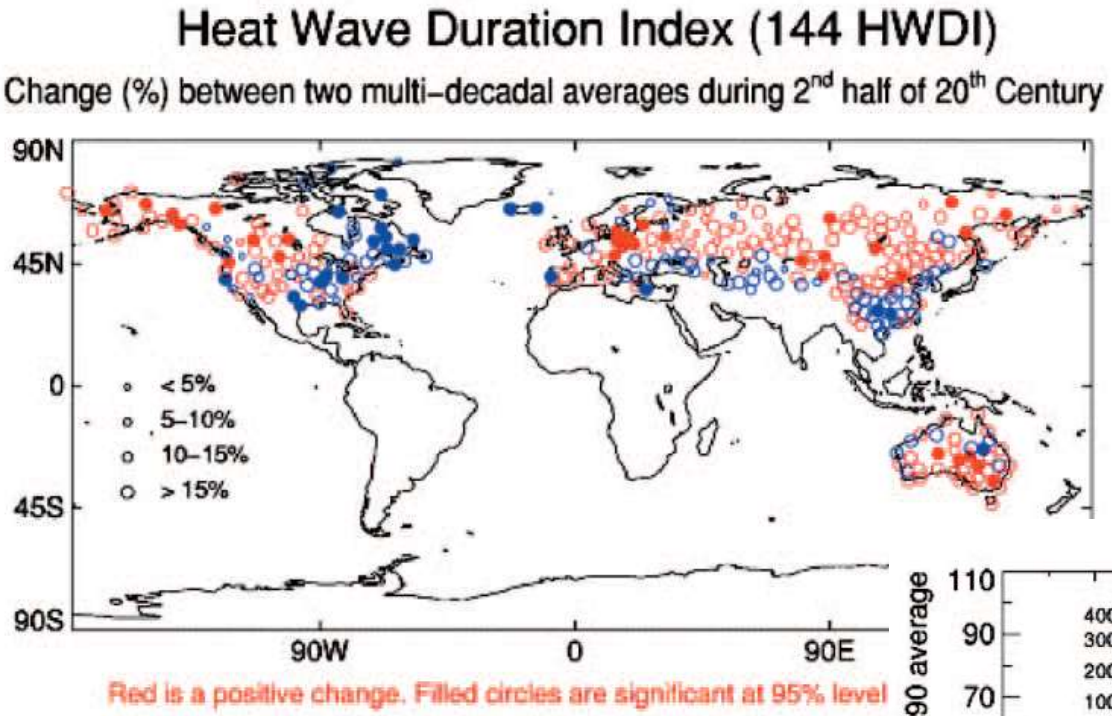
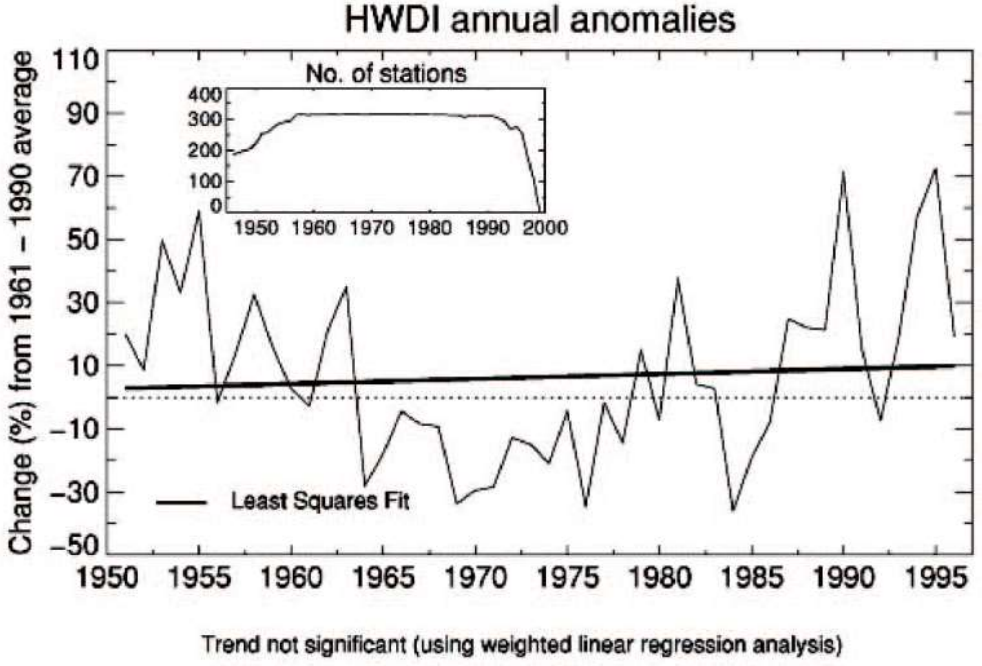
Overview

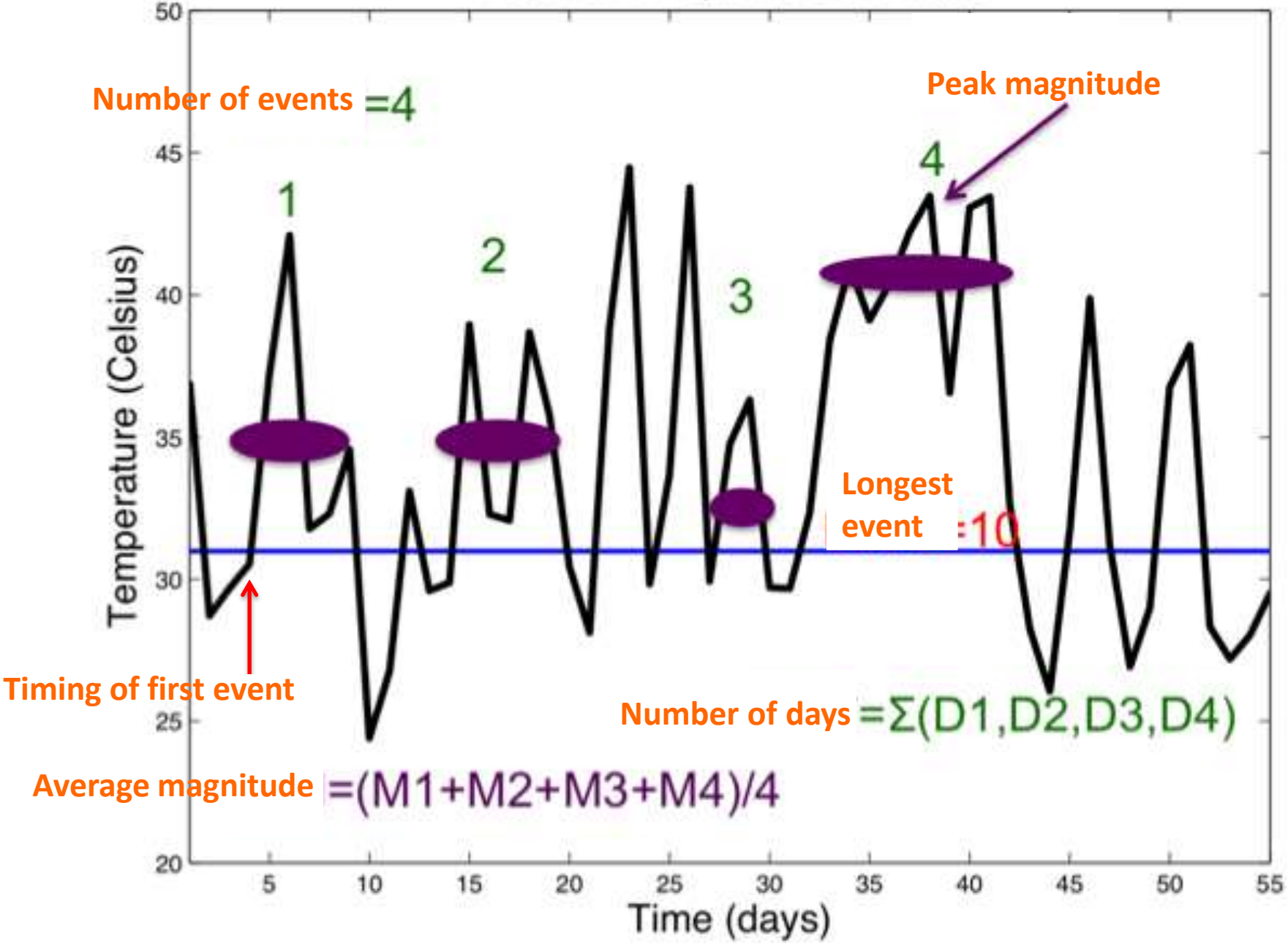
- What do we know about changes in heatwaves?
- What is hampering further assessment?
- Short-term goals and improvements
- In an ideal world……
- Measuring marine heatwaves

Our understanding a decade ago…

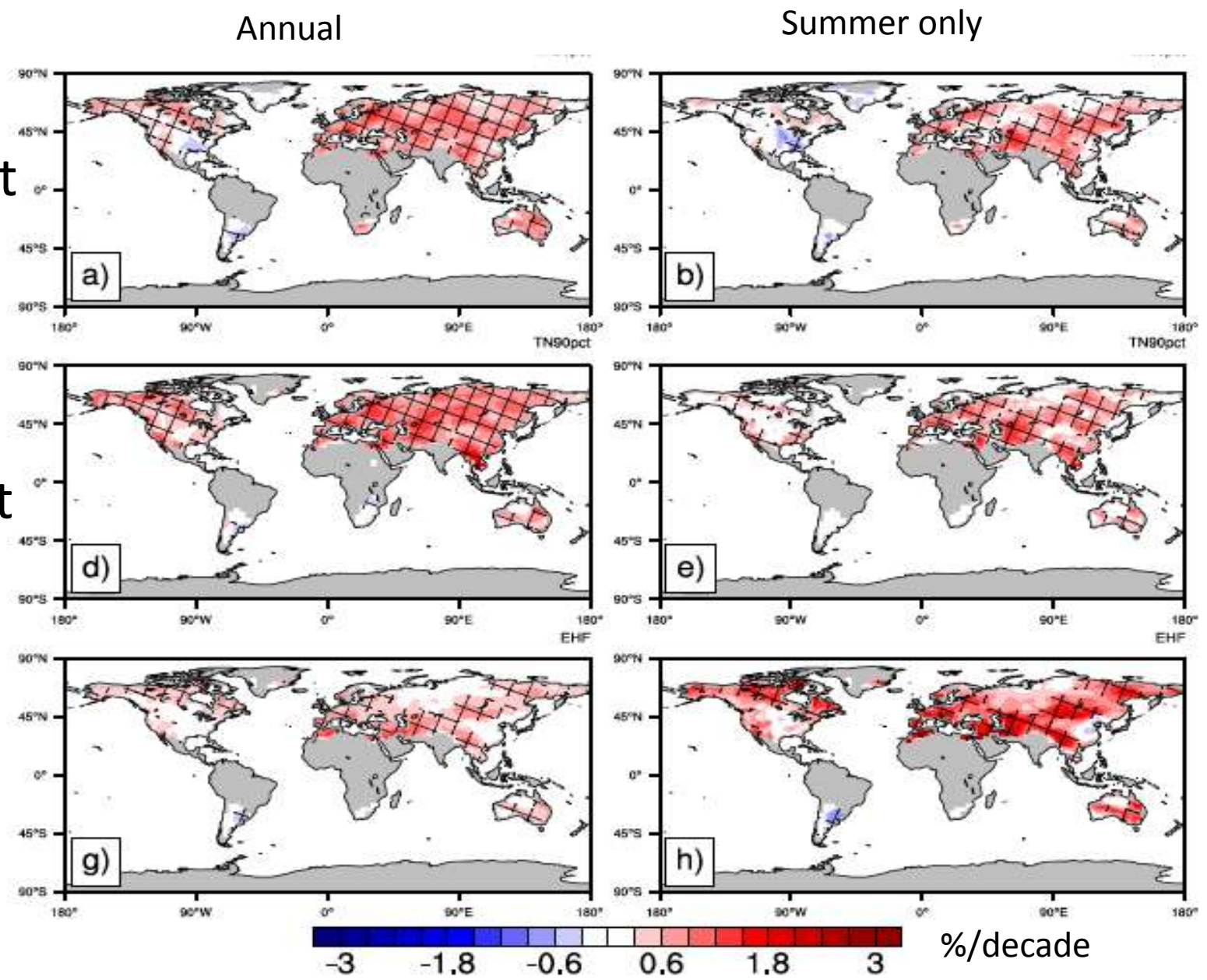




Heatwave Characteristics schematic



HWF (number of heatwave days)

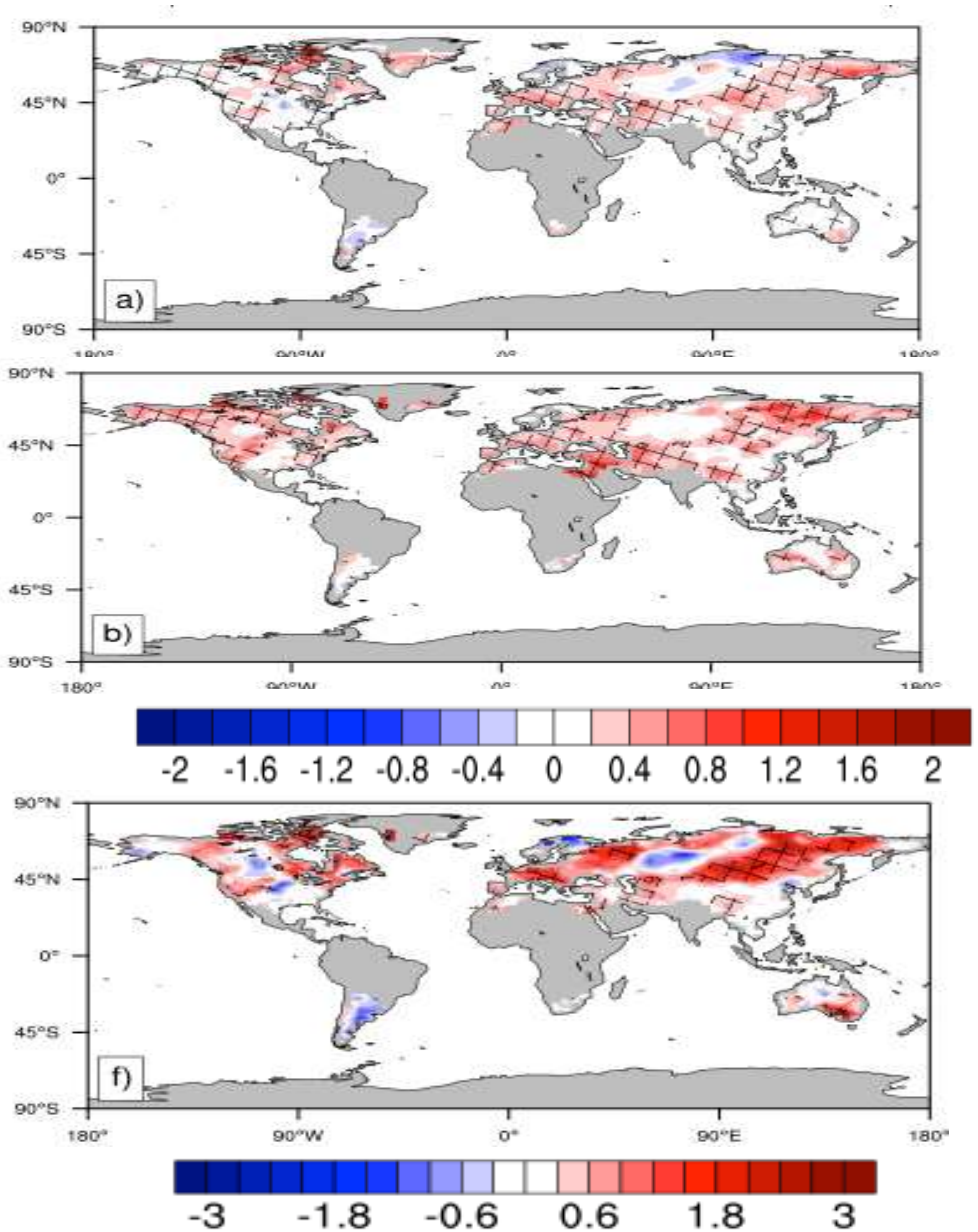


HWA (hottest day)

CTX90pct

CTN90pct

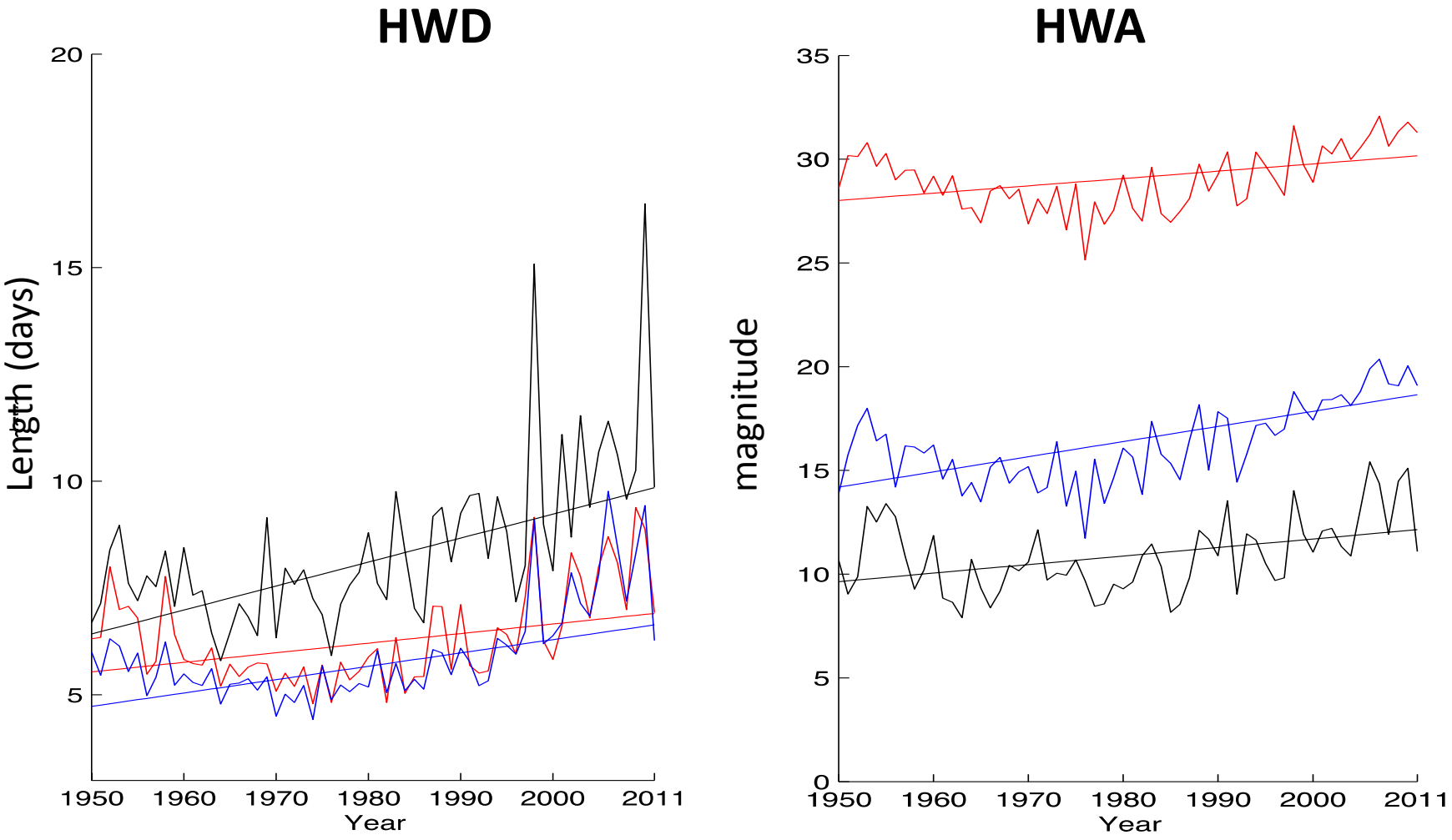
EHF



Deg C/decade

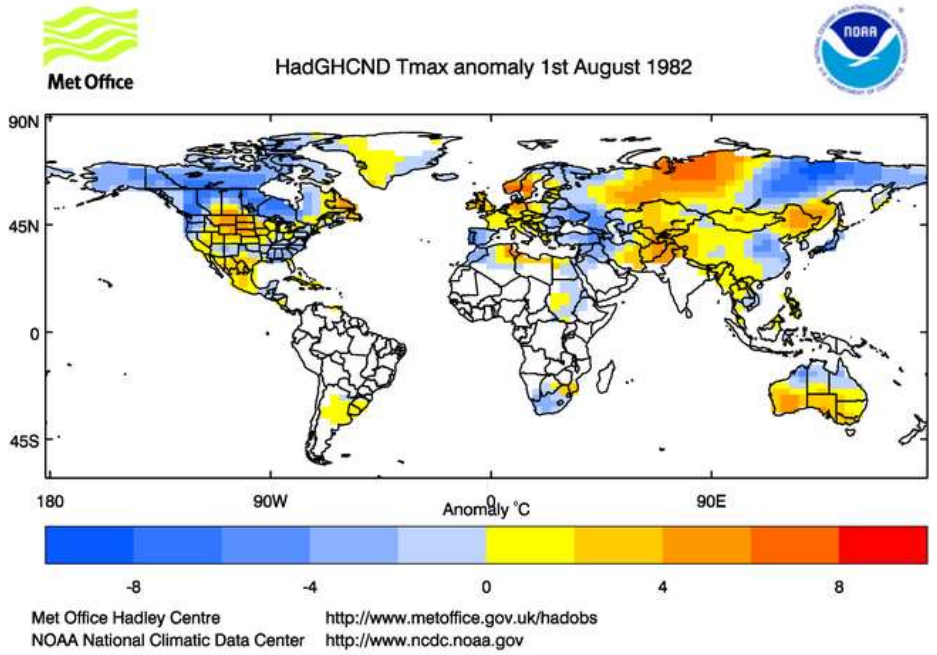
Deg C^2/decade

Global averages across different definitions

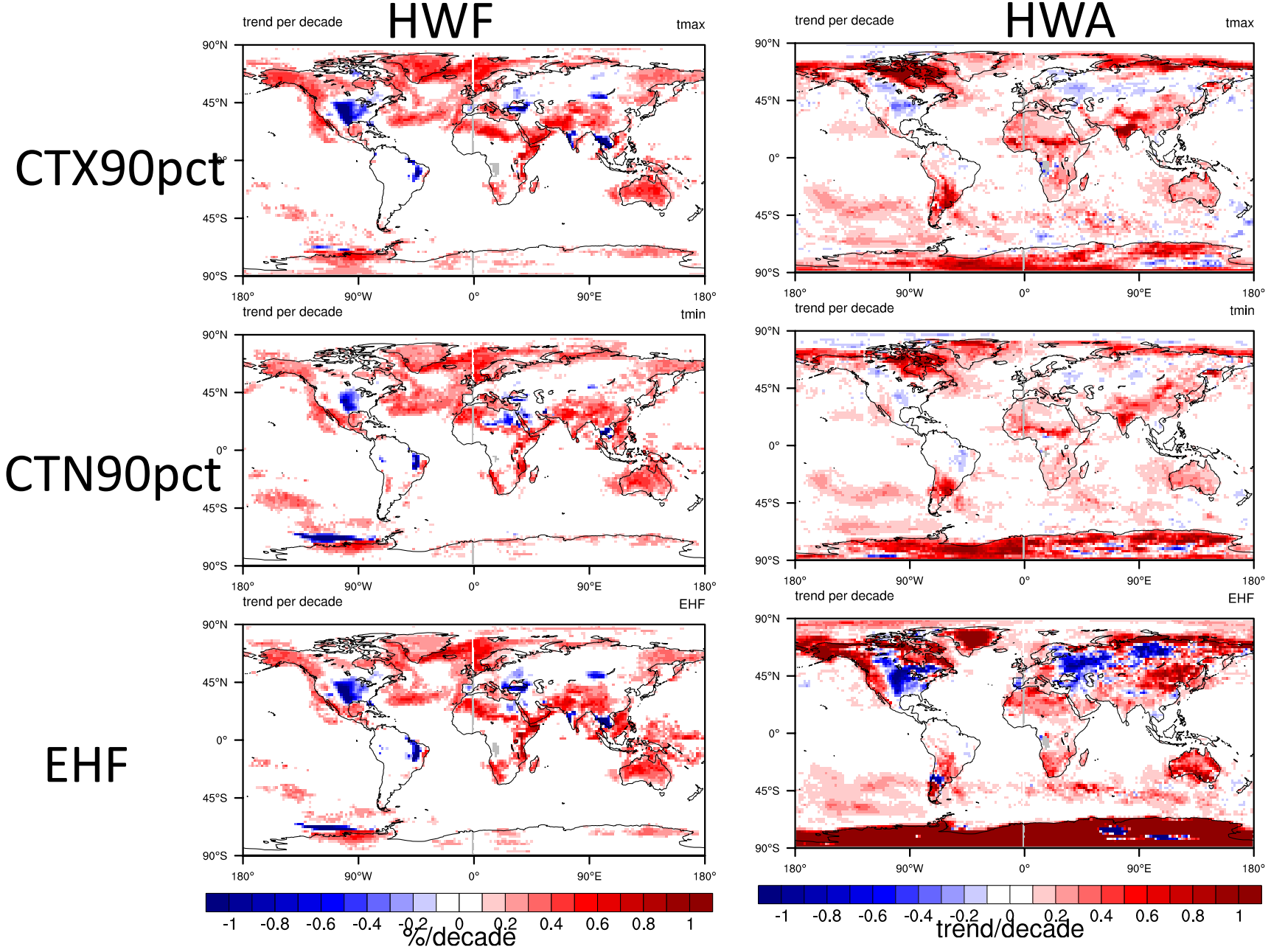


Current data limitations

- I can think of only one dataset I would use…
- spatial coverage!
- Regular updating
- Quality control
- Lack of continuous coverage
- Resolution
- Product uncertainty



Solutions – reanalysis products?



Solutions – data workshops/existing structures

- Plausible to obtain data from missing countries?
- Some of this already has been achieved – e.g. HadEX2/HadGHCNDEX.
- Include some heatwave indices in these frameworks?
- Stored with these datasets, or in a separate repository? – be freely available for download
- Put heatwave indices on list for upcoming/future workshops?
  - Regularly updated 
  - Greater spatial coverage 
  - Better resolution 
  - Longer record 

Solutions – future improvements

- Indices so far have been solely based on temperature
- Can we do better than this? Will help with impacts perspectives/ index development in relation to physical processes
- Humidity for apparent temperature related indices
- Rainfall for soil moisture proxies
- Sub daily data?

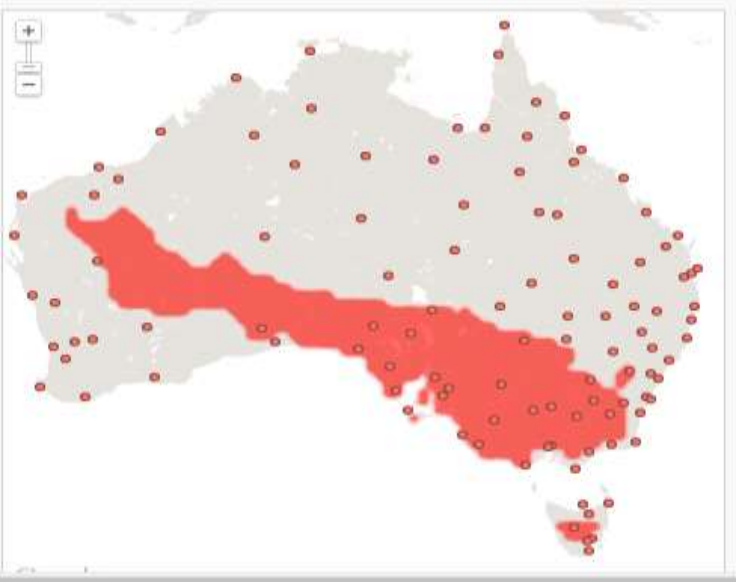
In an ideal world….

- At LEAST daily coverage across all continents
- Regular updates of data – can pull out recent interesting events quickly, compare to others in the climate record.
- Indices are calculated as data is available – automated
- Freely and easily accessible
- Consistent temporal coverage
- Other data made available to explain context and impact of events quickly
- More than one dataset? Gridded as well as stations?
- Code made available for people to fit to own data
- Higher resolution!
  - Intensity/severity/duration of heatwaves can vary over a couple hundred kilometres
  - Most climate models are higher resolution these days
  - Greatly increase the usability of the indices outside the climate community.

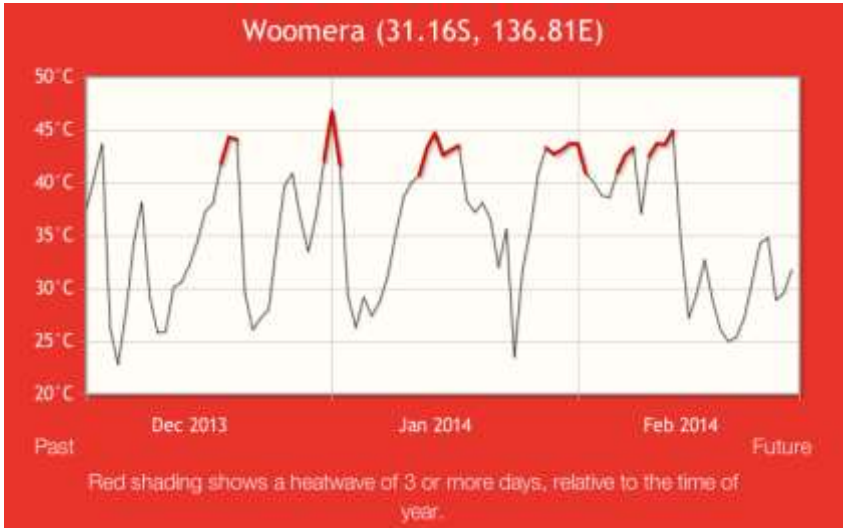
Data issue is not going to be improved until the definitions of a heatwave are agreed upon and updated!!

Measuring marine heatwaves

- Learning from our mistakes ☺
- There has been a few extreme recent events – research effort to devise a framework now rather than retrospectively
- Qualitative and quantitative framework, all rolled in to one
- 3-tier system – onus on user to decide how complex calculations get
- Also some freedom to include what is important for a specific impacts purpose
- Applicable to all data sources and regions
- NOT pre-calculated – positives and negatives to this



Thanks for your time!
Questions?



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