CREATING A WINDSTORM EVENT SET FROM PRIMAVERA DATA FOR THE (RE)INSURANCE INDUSTRY

PRIMAVERA GA4, Barcelona, March 28th 2019
Julia Lockwood, Galina Guentchev, Erika Palin (Met Office),
and WP10/11

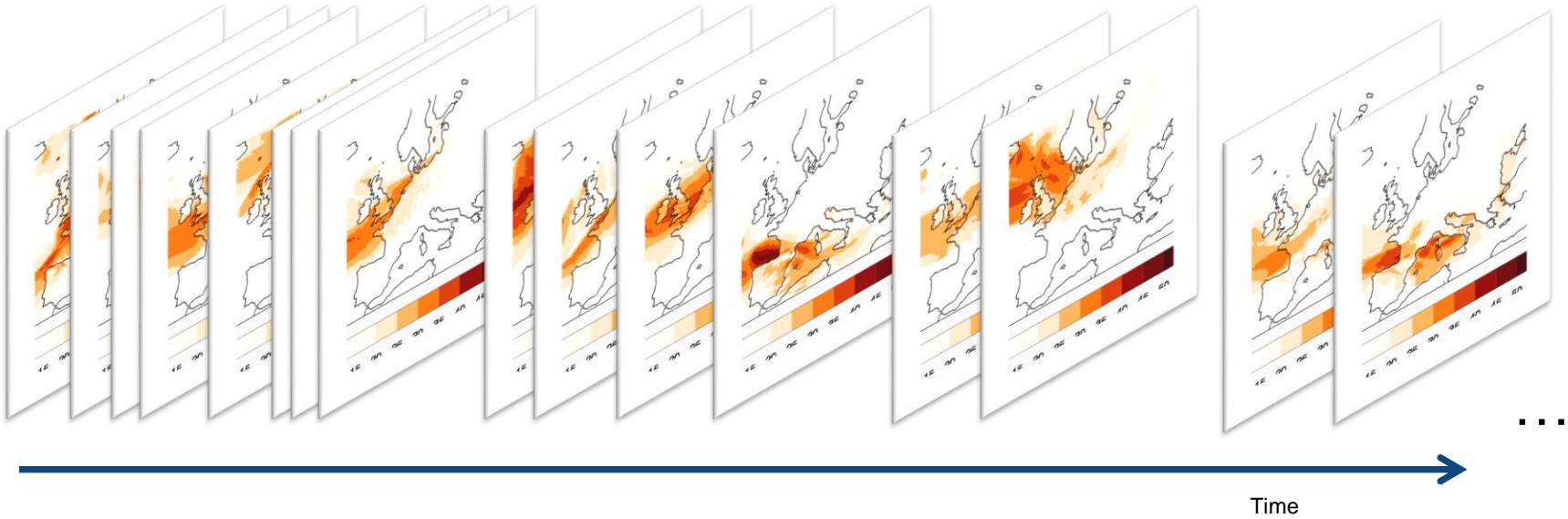# INSURANCE/FINANCE INTERVIEWS

- June 2017 – 8 interviews with insurance/finance companies:
  - Primary insurers
  - Re-insurers
  - Risk management/consultancy companies
  - Regulators
- More info: D11.6, D10.1
- Mostly interested in windstorms and flooding for Europe
- Present day risk, or near-term future (<5-10 yrs)
- Solvency II regulation: Hold enough capital to withstand 1/200 year event.
- Catastrophe modelling

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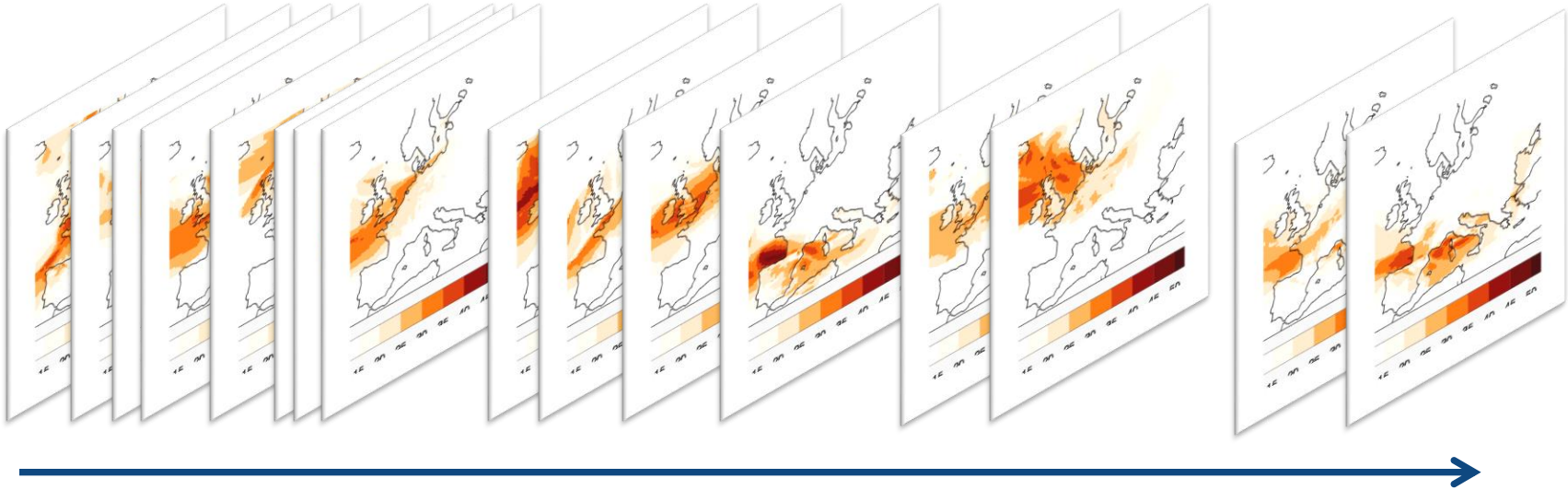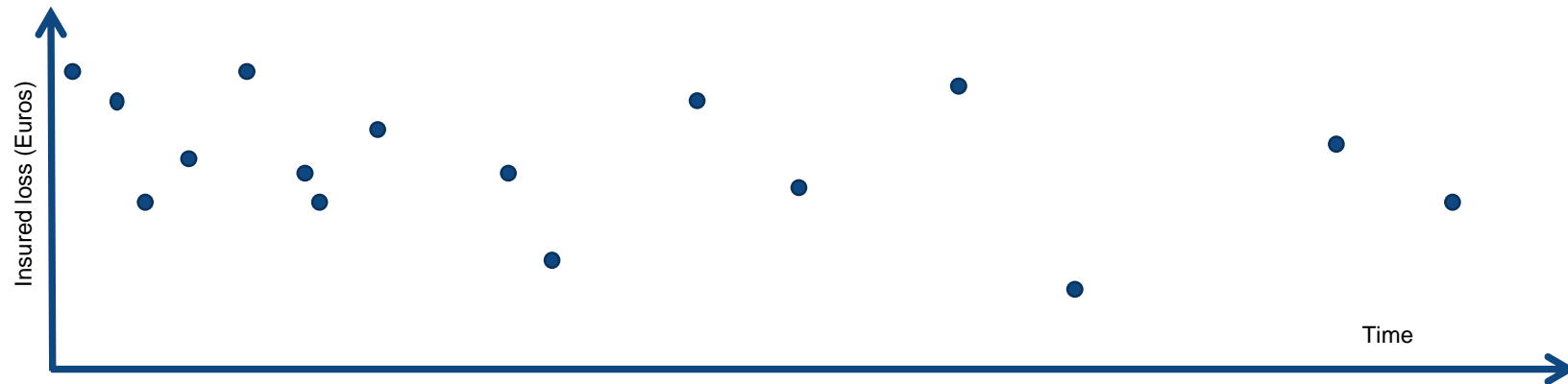# CATASTROPHE MODELLING

▪ Hazard 'footprints' – event set

Time

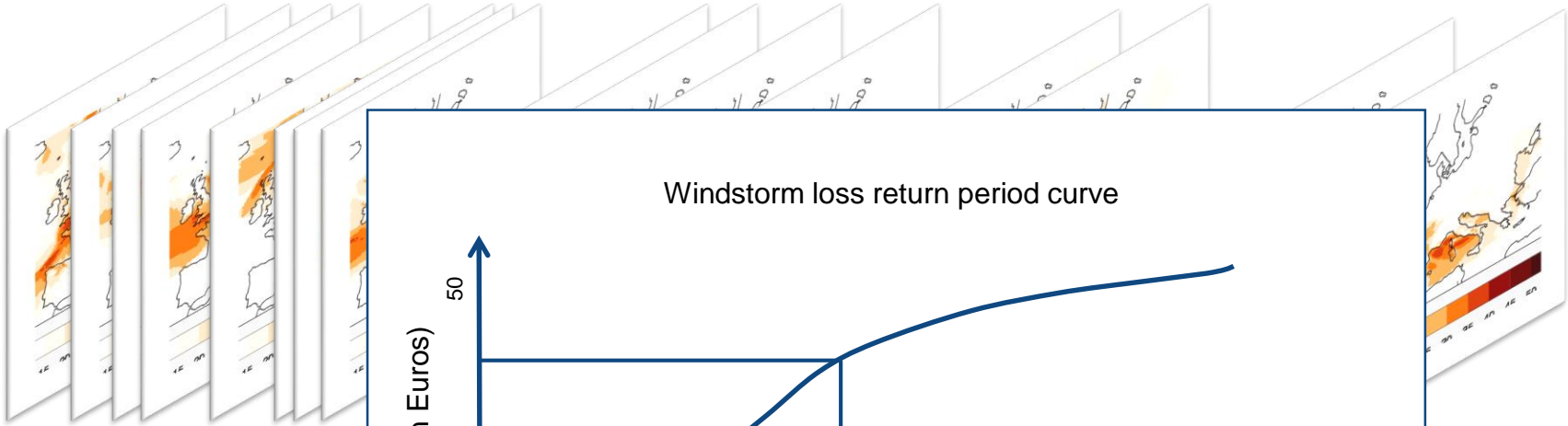PRIMAVERA

CATASTROPHE MODELLING

- Hazard 'footprints' – event set

Time

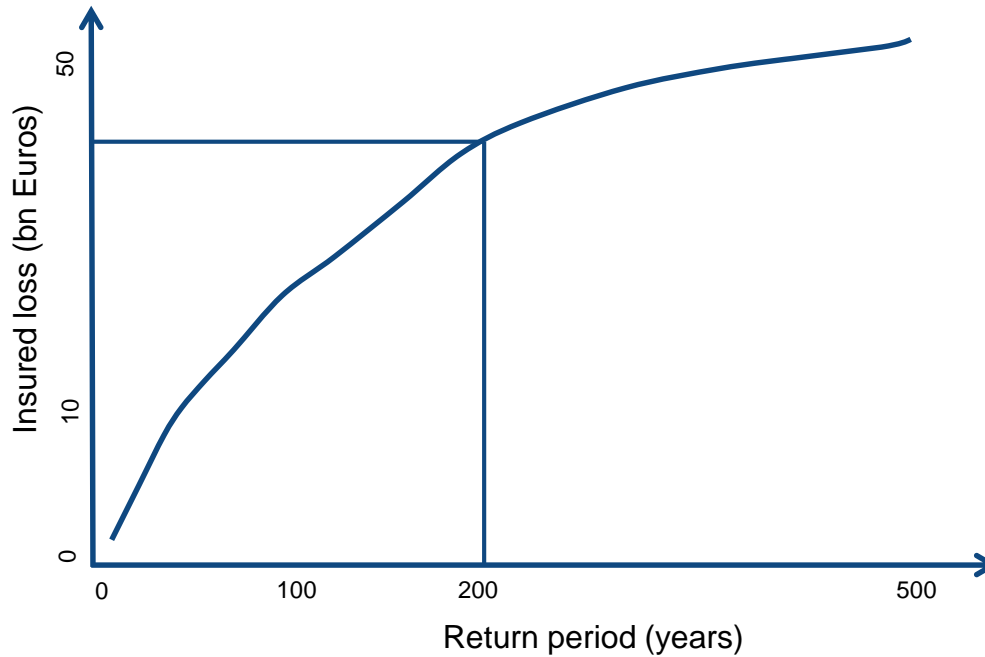- Exposure and vulnerability – calculate loss

Insured loss (Euros)

Time

CATASTROPHE MODELLING

▪ Hazard 'footprints' – event set

▪ Exposure and vulne

Insured loss (Euros)

Windstorm loss return period curve

Insured loss (bn Euros)

50

10

0

0   100   200   500
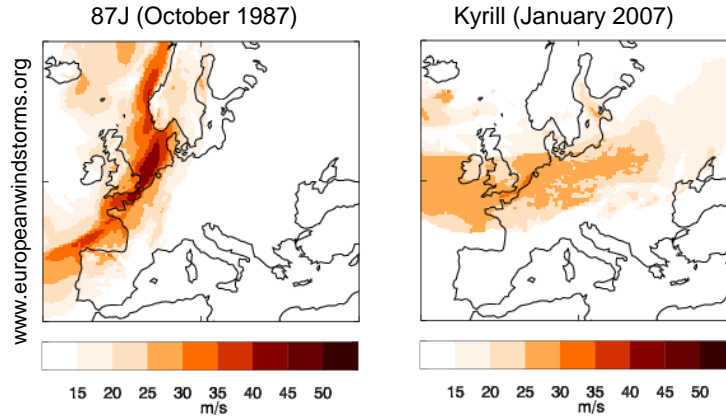
Return period (years)
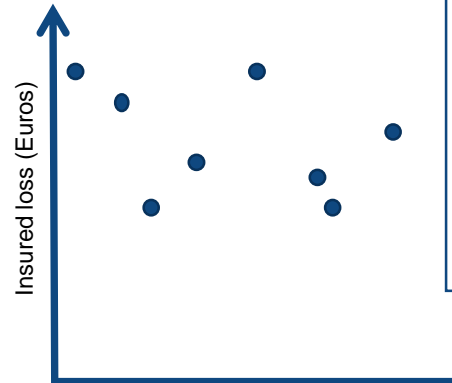
- Observational record too short – need statistical models or climate/dynamical models

- Use PRIMAVERA models to generate hazard footprints

- Atmosphere only, historical runs (1950-2014)

- Method (XWS – www.europeanwindstorms.org; WISC - https://wisc.climate.copernicus.eu/wisc/):
  - Track winter extra-tropical cyclones (Hodges 1995)
  - Find time of max 925hPa wind speed over European land
  - Max gusts/winds over 72 hours

www.europeanwindstorms.org
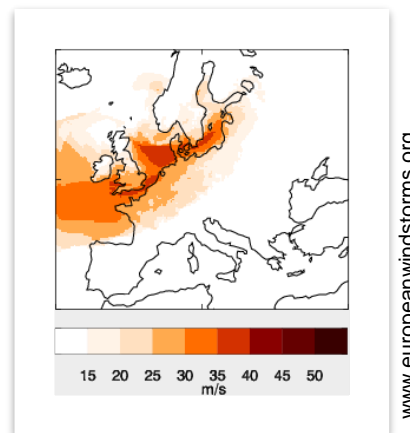
ANALYSIS

- Compare properties of footprints across resolutions and models (area, intensity)

87J (October 1987) Kyrill (January 2007)

www.europeanwindstorms.org

15 20 25 30 35 40 45 50
m/s

15 20 25 30 35 40 45 50
m/s

- Simple catastrophe model (eg. loss ~ $\Sigma_i$population density$_i$*(gust$_i$>25m/s)^3 – how do differences in storm track between models/resolutions translate to losses? (See slides by Galia Guentchev, [Tuesday] and following talk)
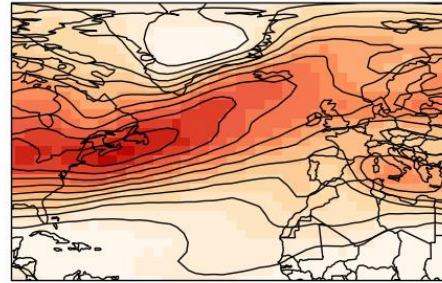
- Any benefits to 25km resolution compared to 60km?

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ANALYSIS

▪ Compare properties of footpri

87J (October 198?

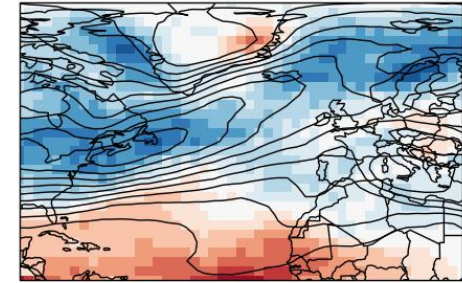www.europeanwindstorms.org

15 20 25 30 35 40
m/s
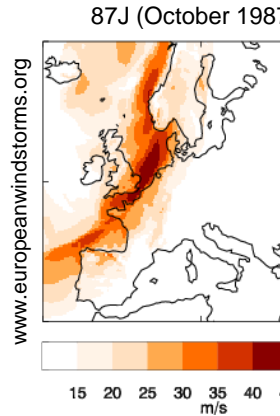
▪ Simple catastrophe model (eg
in storm track between model
[Tuesday] and following talk)

Met Office, atm only
Track density bias

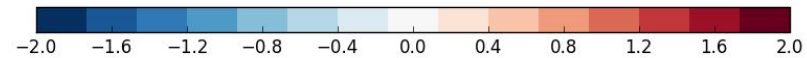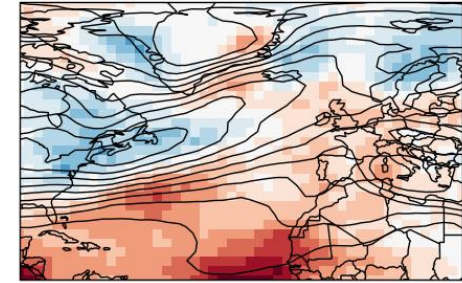ERA   N96 (130km)

N216 (60km)   N512 (25km)

−2.0 −1.6 −1.2 −0.8 −0.4 0.0 0.4 0.8 1.2 1.6 2.0
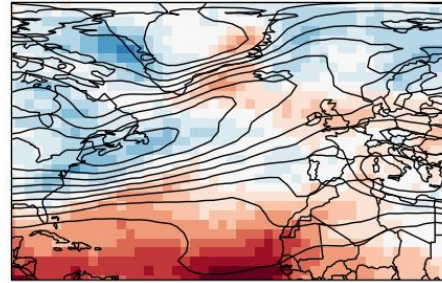
▪ Any benefits to 25km resolution compared to 60km?

WEBINAR

- Presented plans to industry in webinar (19th March)

- Positive response!

- Also interest in footprints from future climate runs, flooding, climate change v natural variability

- Some issues:
  - Need at least daily max winds (no data from ECMWF?); Prefer maximum gusts (only two models – Met Office and EC-Earth)
  - Storms only tracked in 3 month seasons (SON, DJF, MAM, JJA), but want October-March storms.
  - How to share data?

ANY QUESTIONS?

primavera_inquiries@bsc.es

@PRIMAVERA_H2020

julia.lockwood@metoffice.gov.uk

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