

Weather Forecast Development – Ensuring Local Resilience

Hazel Reeve – Met Office Advisor





My Background

- Joined the Met office 1979 as an observer
- Manchester 'Ringway' Airport
- Various Weather Centres – Public Facing
- Numerous RAF stations – Defence
- Met Office Advisor since 2013





The Met Office

Headquarters in Exeter Devon

Over 1700 staff in 60 locations
around the world.

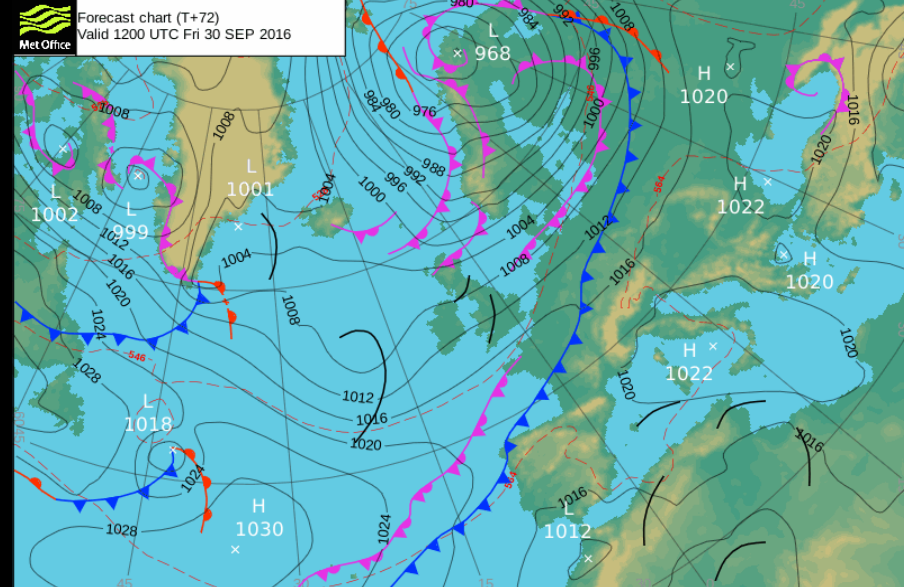
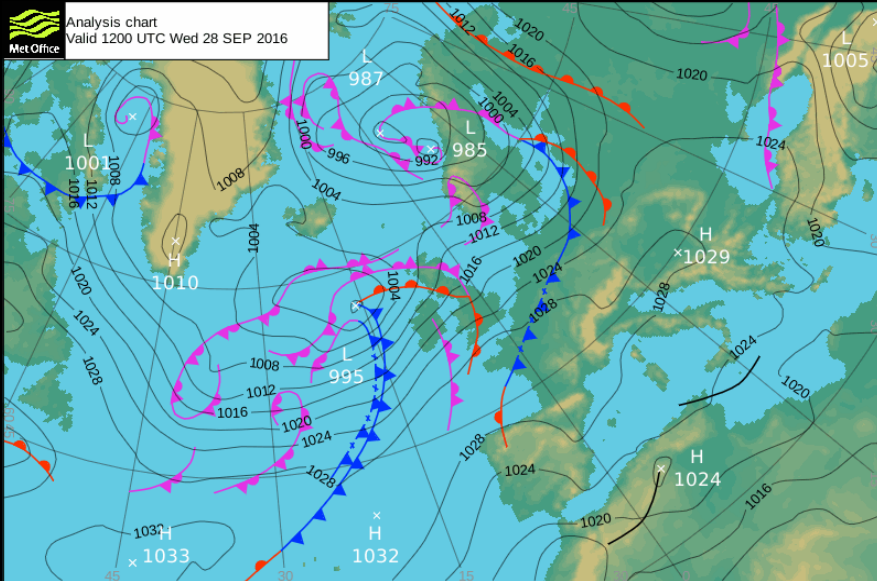
Home of our super computer





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The Forecasting Process



The forecasting process



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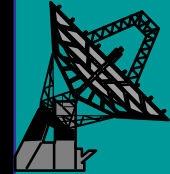
Observations from space



Upper-air observations



Surface observations

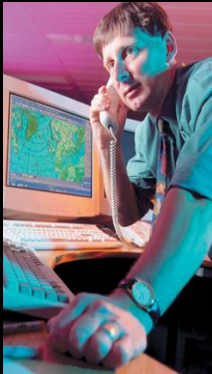


Weather radar

Supercomputer processes and produces information

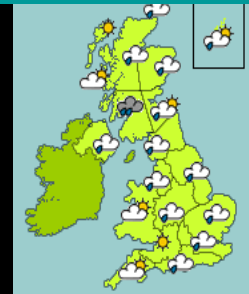


Filter out 'unlikely' data



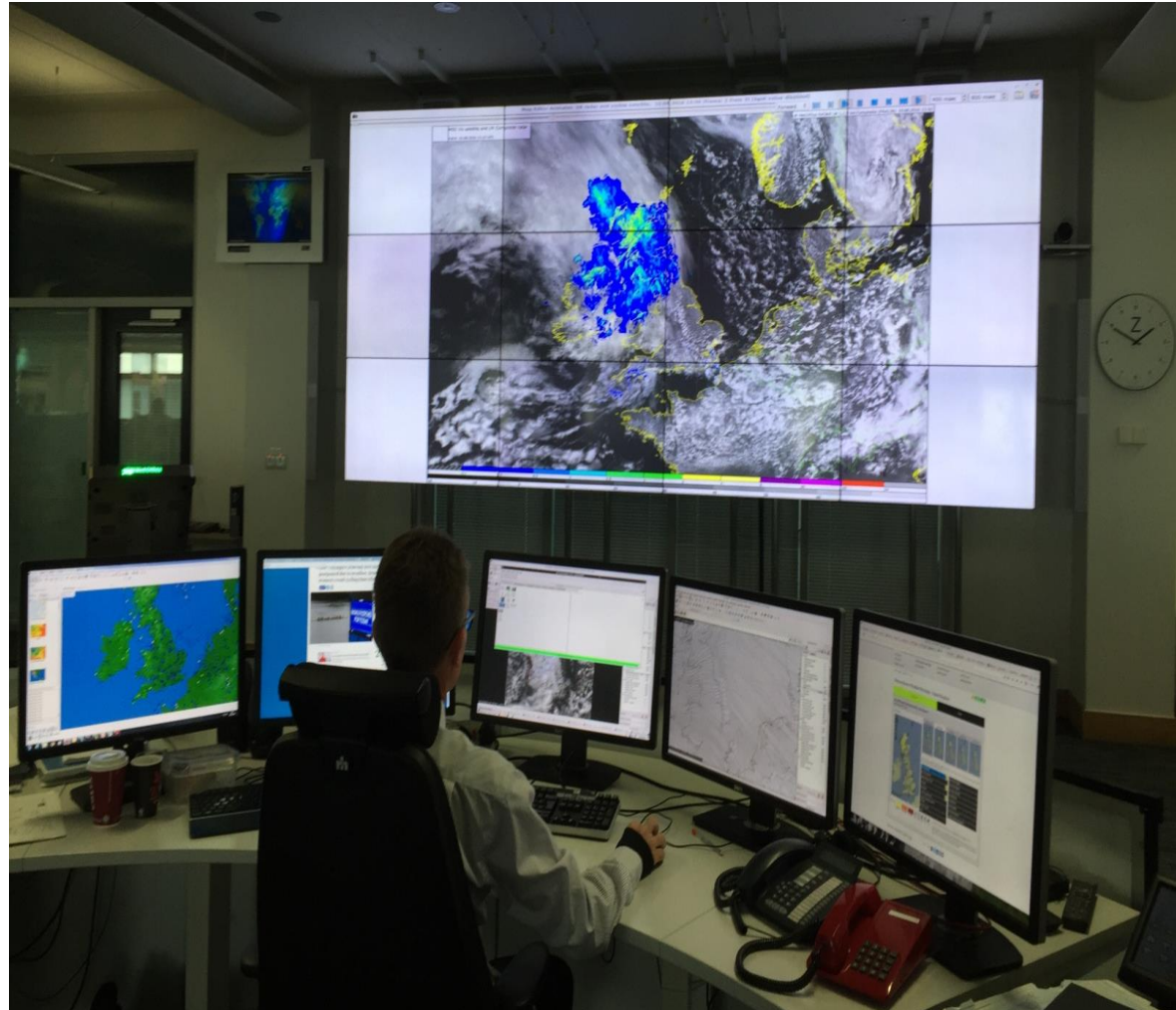
Forecaster uses this information to produce

A weather forecast!



Mon 4 Oct 2004
Daytime weather

Analysing the Weather





Sourcing weather observations



Ground-based Weather instruments





Met Office

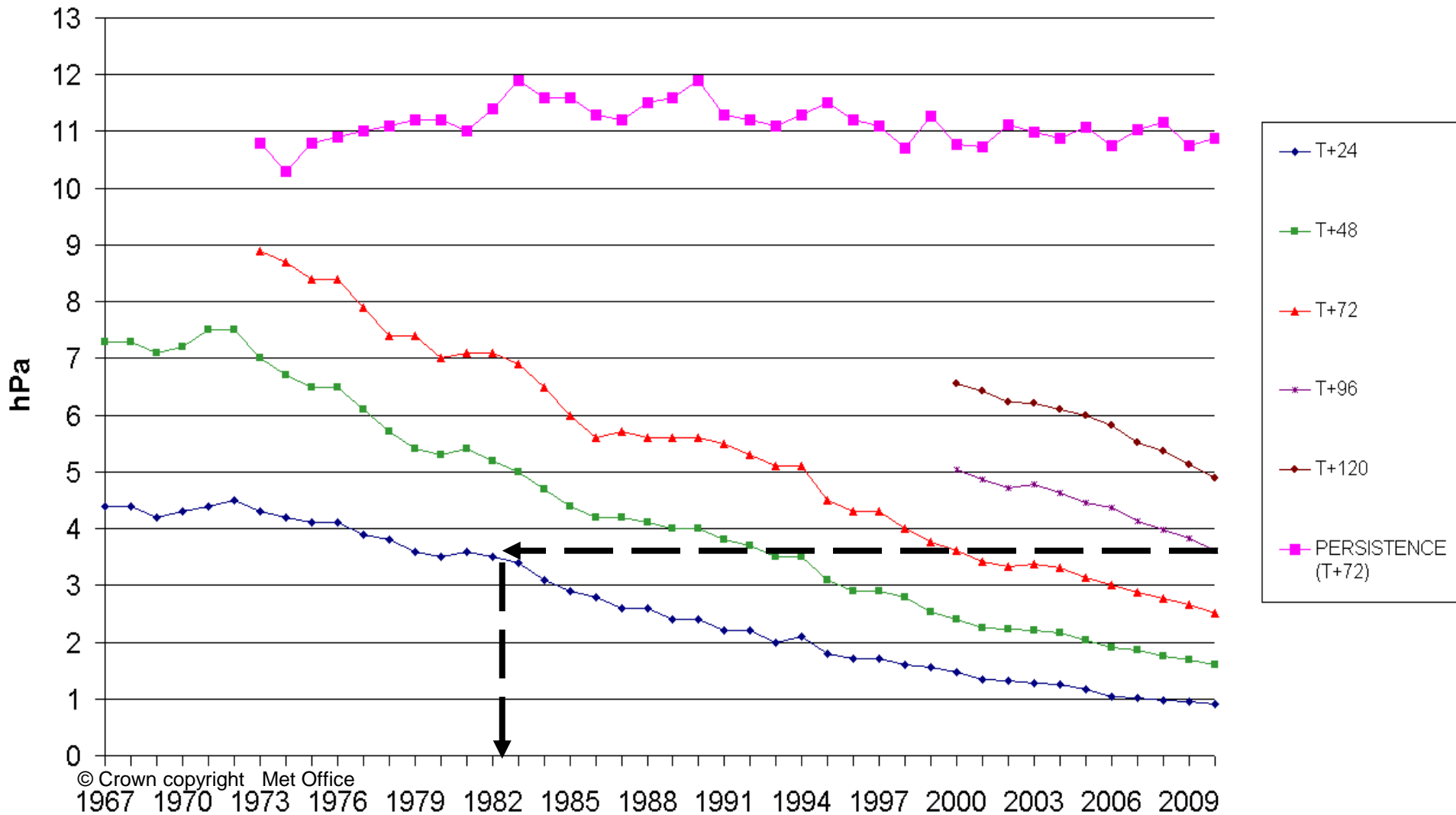
Forecast Accuracy – What Affects It?

- Research – Computation
- Getting the starting conditions correct is critical
- Identify errors in starting conditions
- The Met Office's Global forecast model takes 95 minutes to produce a forecast for the whole world for 6 days
- It is run 4 times a day
- The forecast becomes less reliable into the future



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Improving accuracy





Met Office Numerical Weather Prediction (NWP) Models

Previously
40km
Upgrade 2010

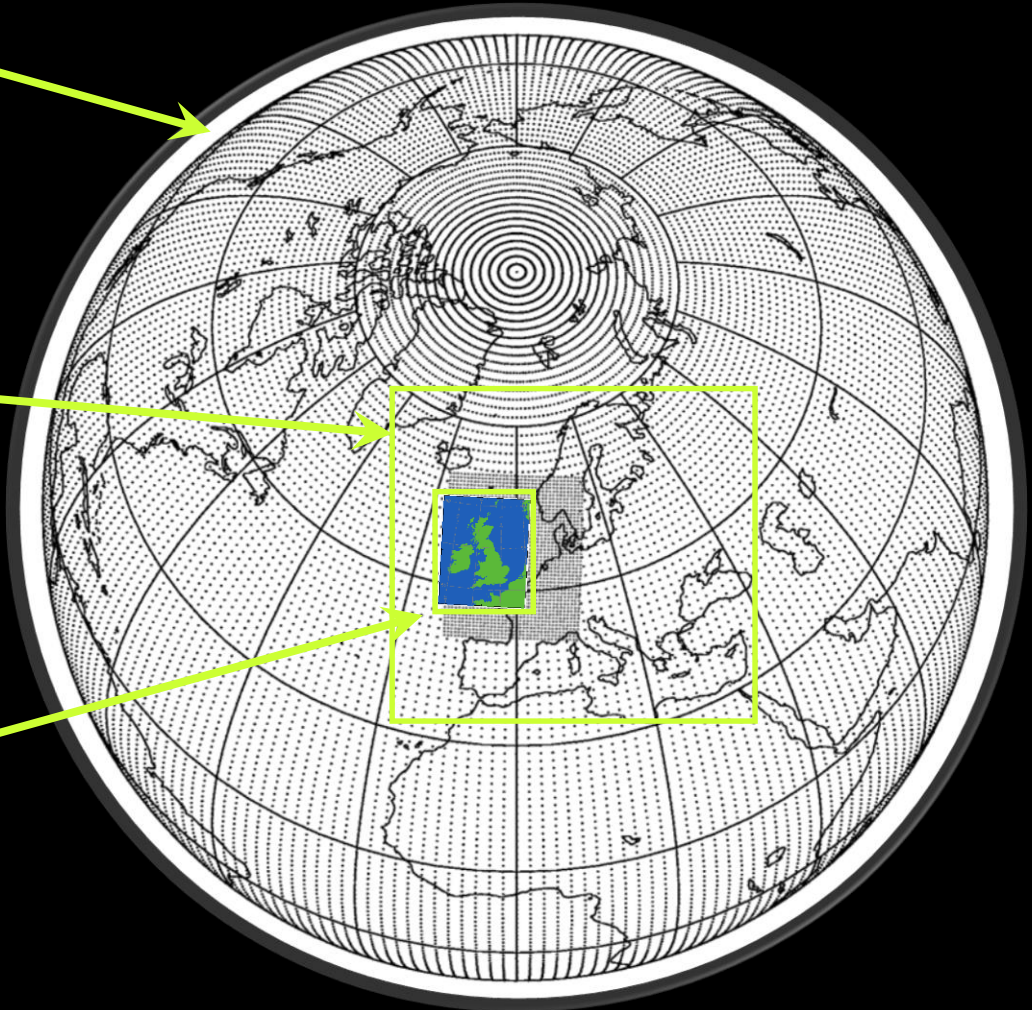
Global
➤25km

Previously
12km
Upgrade 2013

Euro4
➤4.4km

Previously
12km
Upgrade 2006
4 KM
Upgrade 2012

UKV
➤1.5km

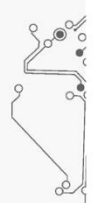


The New Supercomputer



THE NEW SUPERCOMPUTER WILL BE ONE OF THE **FASTEST** IN THE WORLD

AT PEAK PERFORMANCE, IT CAN DO MORE THAN **3 MILLION** CALCULATIONS PER SECOND FOR EVERY MAN, WOMAN AND CHILD ON THE PLANET — THAT'S MORE THAN **23,000 TRILLION** CALCULATIONS PER SECOND




The Latest Public Weather Service Value for Money Review - March 2015

The latest review concludes with high confidence that the benefits of the Public weather Service (PWS) are:

- very likely to exceed £1bn per annum and
- likely to be close to £1.5bn per annum

AT 140 TONNES, THE NEW SYSTEM WILL WEIGH AS MUCH AS

11 DOUBLE DECKER BUSES

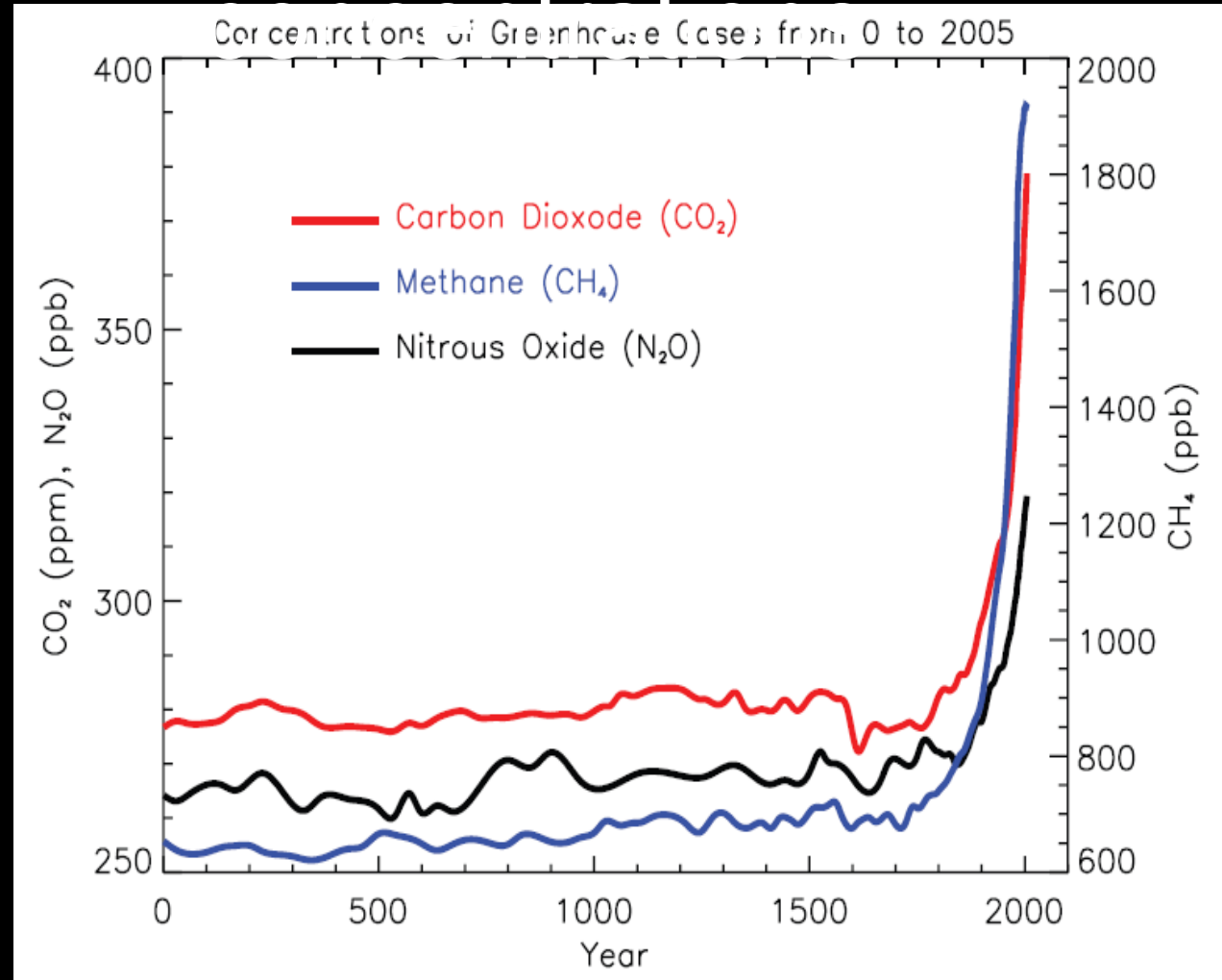


IT WILL HAVE **17 MILLION** GIGABYTES OF STORAGE ENOUGH TO STORE OVER **100 YEARS'** WORTH OF HD MOVIES

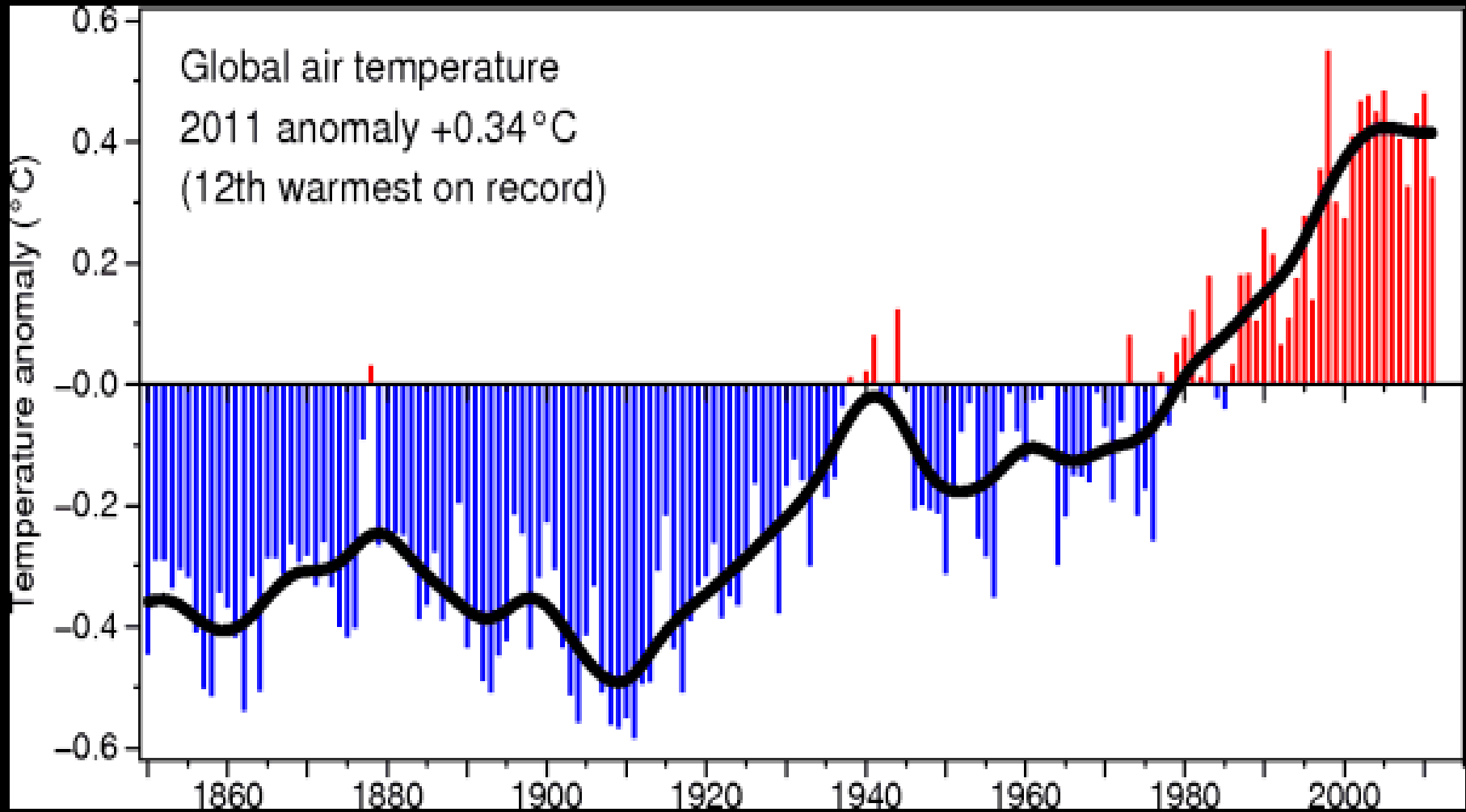


Greenhouse Gas

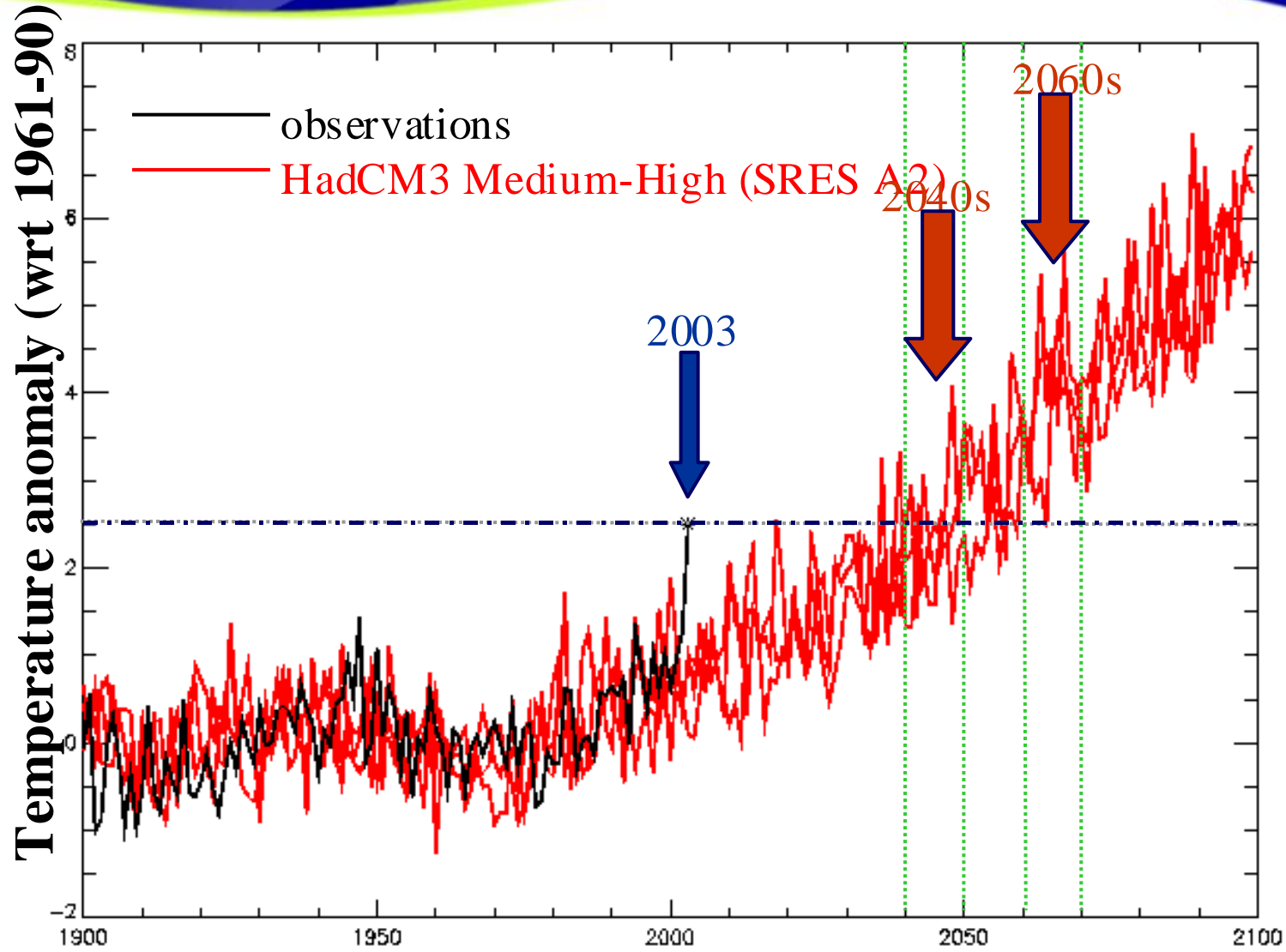
Burning fossil
fuels.
Deforestation.
Farming
practice.
Industry.



Global average surface air temperature change, compared to the end of the 19th century



European 2003 summer temperatures: normal by 2040s, cool by 2060s



“February dispensed with the one-month-old record by a full 0.21C – an extraordinary margin to beat a monthly world temperature record by.”

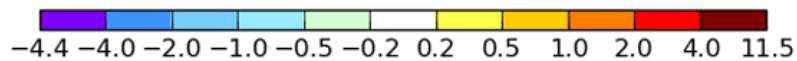
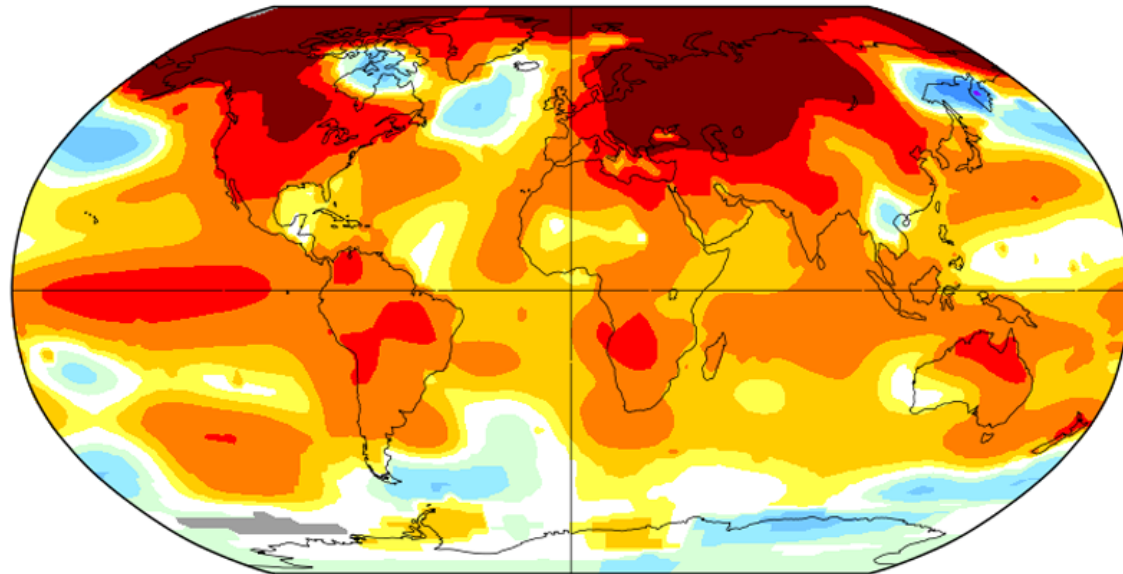
“This result is a true shocker, and yet another reminder of the incessant long-term rise in global temperature resulting from human-produced greenhouse gases,” said Masters and Henson.

“We are now hurtling at a frightening pace toward the globally agreed maximum of 2C warming over pre-industrial levels.”

February 2016

L-OTI(°C) Anomaly vs 1951-1980

1.35

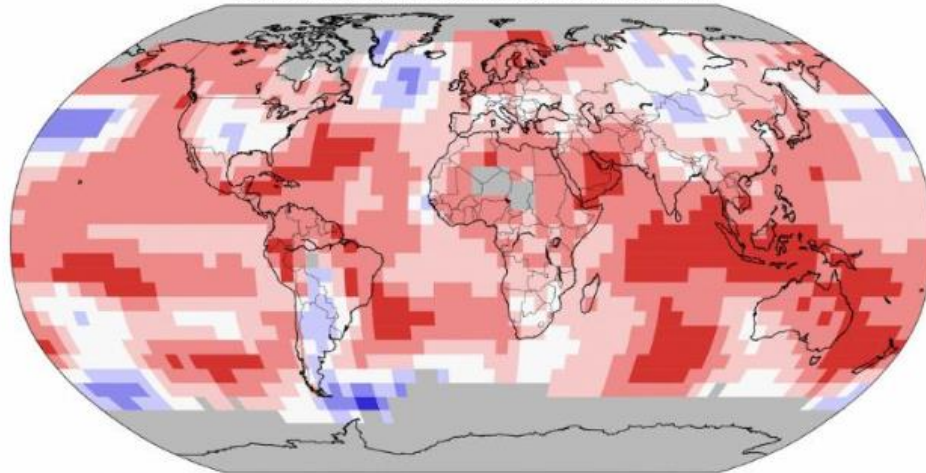


May 2016 Was the 13th Consecutive Warmest Month on Record, NOAA Says

Land & Ocean Temperature Percentiles May 2016

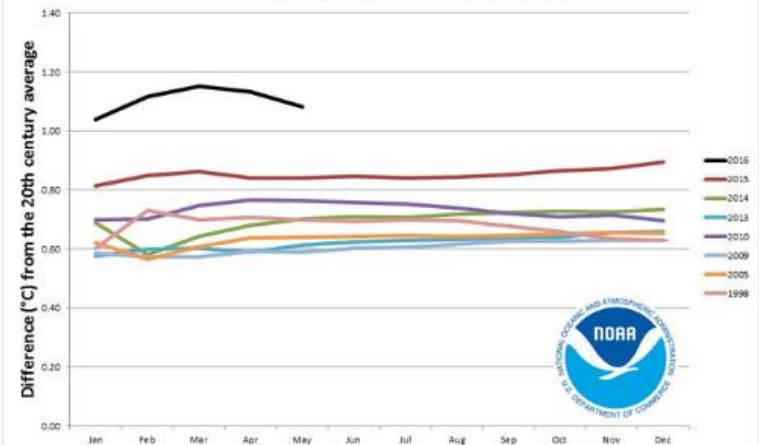
NOAA's National Centers for Environmental Information

Data Source: GHCN-M version 3.3.0 & ERSST version 4.0.0



Year-to-Date Global Temperature

for 2016 and the other seven warmest years on record





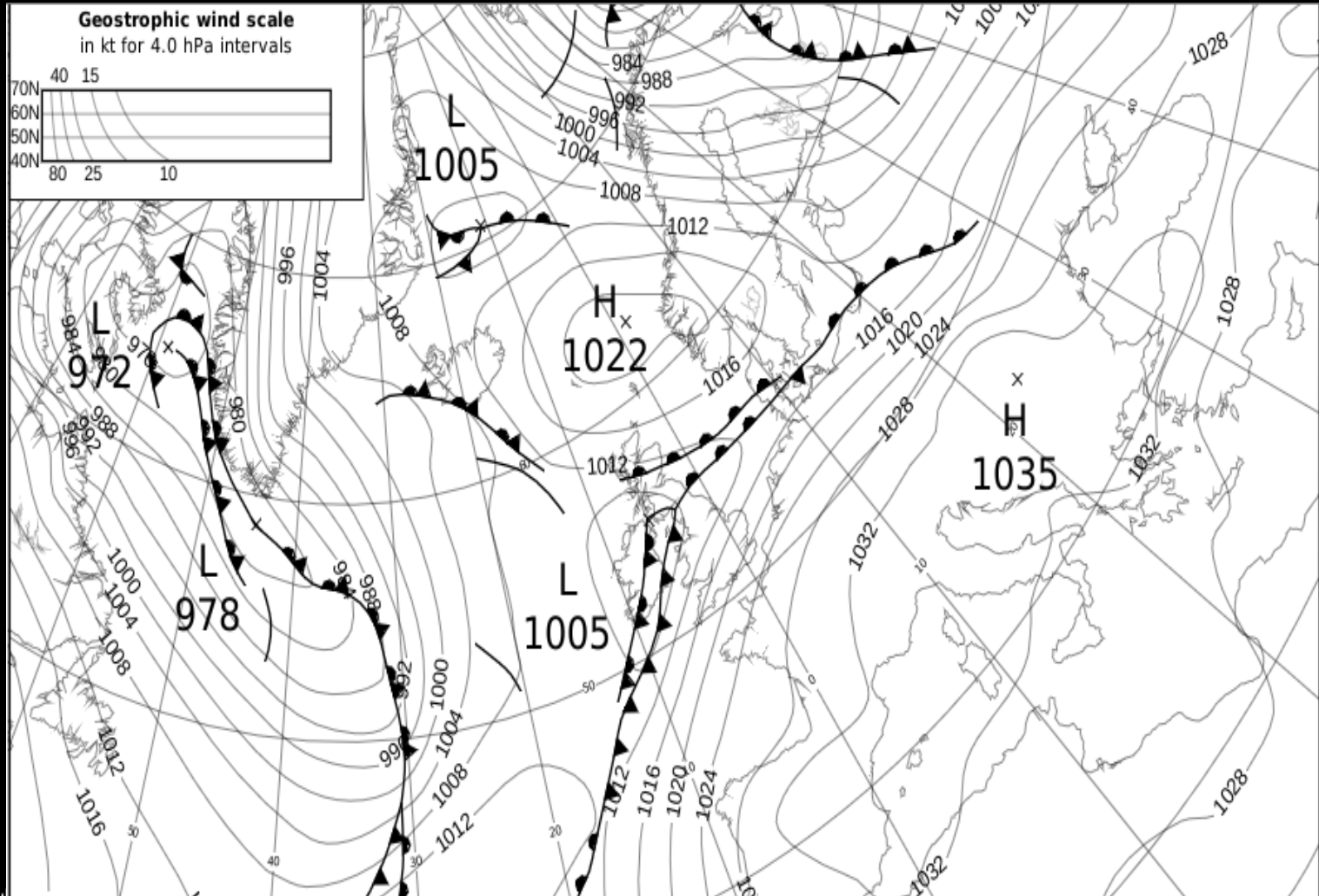
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Climate change - likely resulting changes in our weather

- Warmer, drier summers
- Milder, wetter winters
- Increasing likelihood of summer heatwaves
- Severe thunderstorms (Summer 2016)
- Reduced occurrence of winter frost and snow
- Likely increase in extreme rainfall/wind events
- Longer growing season



Met Office Saturday 26th December 2015



Impacts Across Yorkshire



Hebden Bridge



Flooding in Sowerby Bridge



Flooding in Mytholmroyd



Royal Oak pub in Haworth

Thank You

