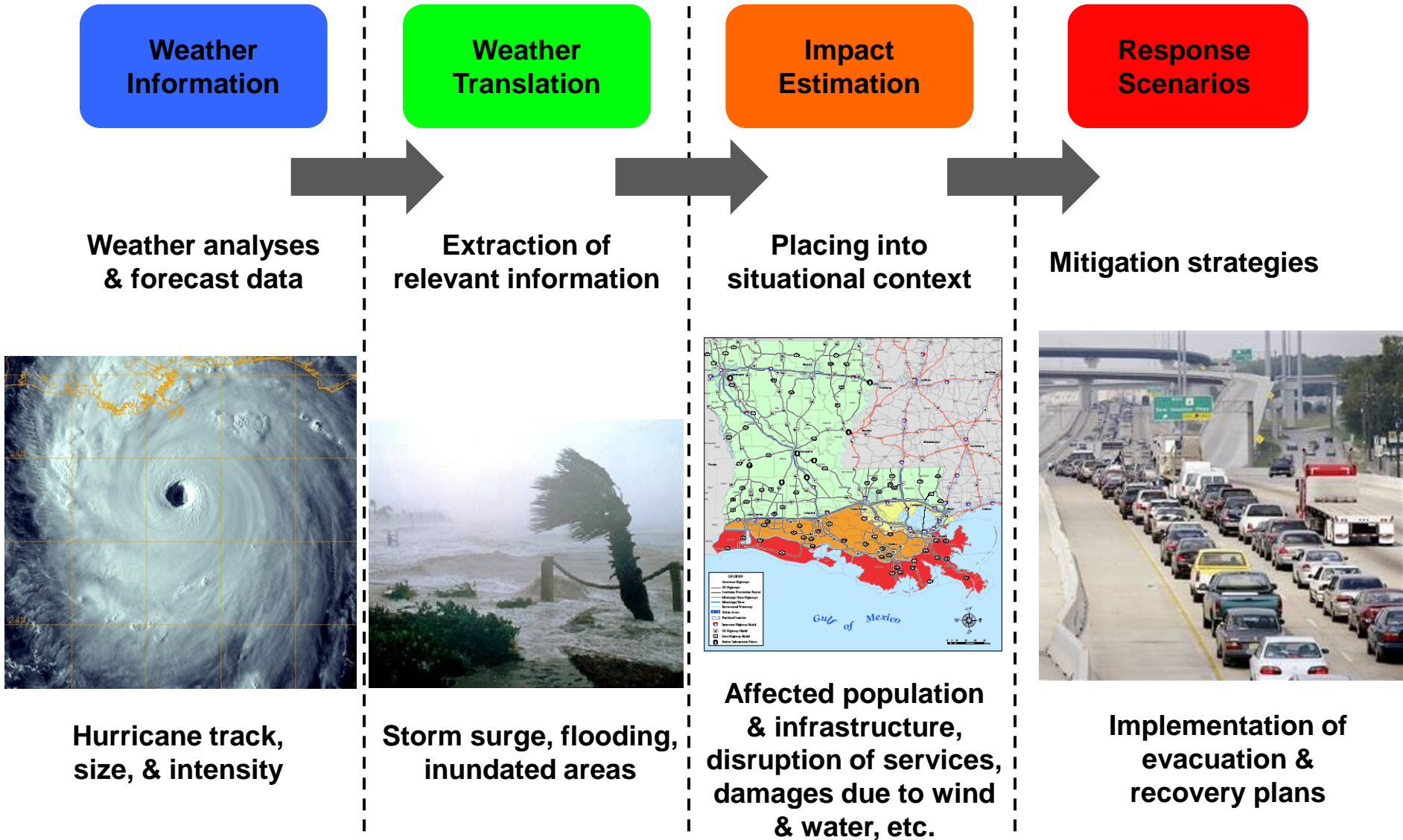


# Science Aspects for TT-IMPACT Plan Development

Kenneth MYLNE

- Impact-based warnings
- Impact forecasting and warnings
- SWFDP and CIFDP
- Uncertainty
- Multi-hazards

# Coping with Hurricanes/Typhoons



# Uncertainty

- Uncertainty is unavoidable
- Ensemble forecasting gives capability – increasing usage
- Translating hazard to impact may increase *or decrease* uncertainty for a decision
  - Most often uncertainty increases with each level of impact
  - Sometimes a small uncertainty in hazard can lead to a huge uncertainty in impact
    - Eg Thames river level 7cm -> 1000+ houses flooded
- Risk matrix

# Impact-based warnings

- HK – rainfall thresholds for landslide warnings depend on past recent rainfall
  - 1-2 years research project to come up with formula for thresholds based on past experiences
  - Cannot be done by NMHS on its own – needs users
  - Need to do that for each impact - *“solutions need to be bespoke”*
  - Needs sufficient cases – keep reviewing and updating
    - Data collection and observations – storage and sharing
- Vulnerability information required – needs partnership
- Mapping – Open Street Map – collect relevant information and makes available to all
  - Geonode example of way to share info
  - Inasafe – pulls Hazards and Exposures together in a GIS environment to be overlaid to give a map and estimates of impacts and actions – allows use of datasets on buildings, populations etc
  - Several others RASOR, CIMA, ADAM (WFP)

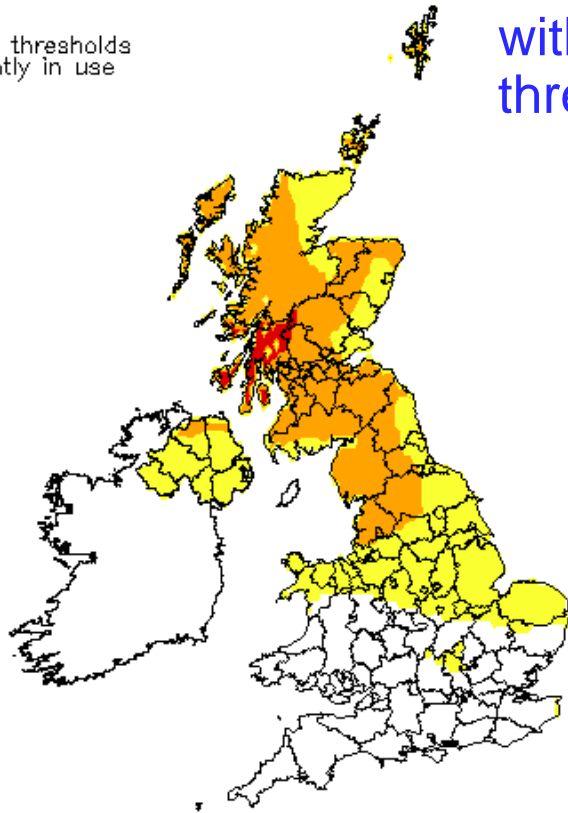
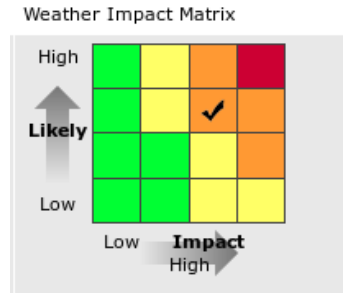


# Strong wind warning

## Thu 5 Dec 2013

Winter thresholds currently in use

Ensemble provides forecaster with First-guess based on impact-based thresholds – vary geographically by vulnerability

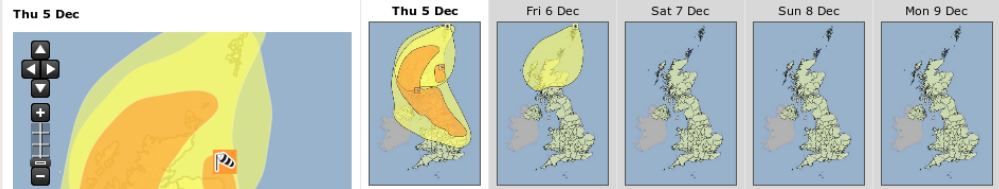


Warning Colour Key



### Warnings overview: United Kingdom

Issued on Thu 5 Dec



Use the small maps above to select the weather warnings over the next five days. Click on your chosen region below for more details of current warnings in force.

United Kingdom		North West England	
Orkney & Shetland		North East England	
Highlands & Eilean Siar		Yorkshire & Humber	
Grampian		West Midlands	
Strathclyde		East Midlands	
Central, Tayside & Fife		East of England	
SW Scotland, Lothian Borders		South West England	
Northern Ireland		London & South East England	
Wales			



The Met Office has responsibility for providing weather warnings for the UK. Coloured regions on the map show where severe weather warnings have been issued. When issued, the public are advised to take extra care. Further information and advice can be found on the: [Severe weather impact links](#) page.

© Crown Copyright 2013. Source: Met Office

Observations showed widespread gusts 80-90mph from N Scotland to Yorkshire

© Crown copyright Met Office

# Impact forecasting and warnings

- Limitations of past cases for extremes
- Physical modelling helps where possible
  - Difficult to test and verify
  - Suitable observations
  - Move towards Environmental Prediction capabilities
- Some early work on modelling specific impacts
- Quality of vulnerability functions is a concern
  - Origin
  - Impact on our reputation – risks for NMHS
  - IP on data may also be an issue

# SWFDP, FFGS and CIFDP

- Less-resourced countries can be supplied with some support data from Global and Regional centres
  - Resource to run ensembles
  - Multi-hazards from different sources
  - Support for vulnerability datasets and expertise from other agencies
  - Training
  - Advice on process to engage user community



# Multi-hazards

- Definitions of hazards (eg heat-wave)
- Translate weather into related hazards
  - Storm surge, landslide, flooding/inundation
  - Volcanic ash transport
  - Higher resolution models improving capability
- Non-weather hazards may have similar impacts - partnerships
  - Tsunami
  - 24/7 capability for dissemination
- Interdependency between different hazards leading to similar or increased impacts