Weather Forecast Improvements at the UK Met Office:
Responding to the Big Data Challenge

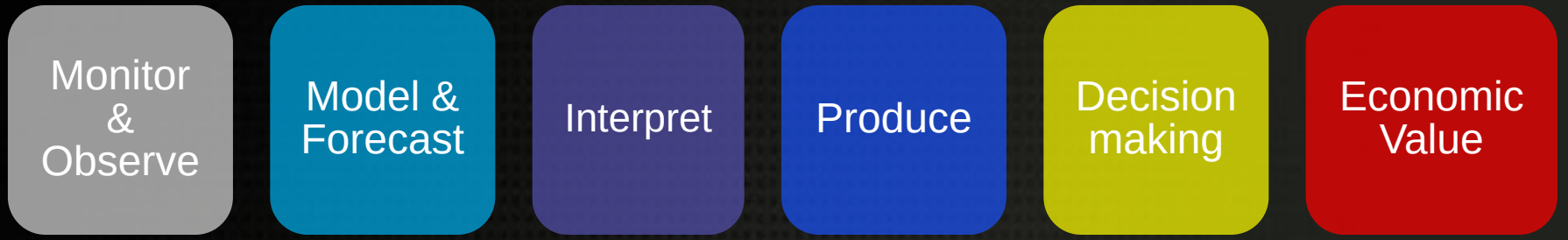
Vicky Pope

Input from Rich Carne, Alex Longden, Derrick Ryall

January 2017

© Crown copyright

Weather Information Value Chain



© Crown copyright

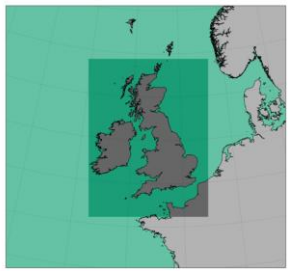
Met Office

Monitor & Observe

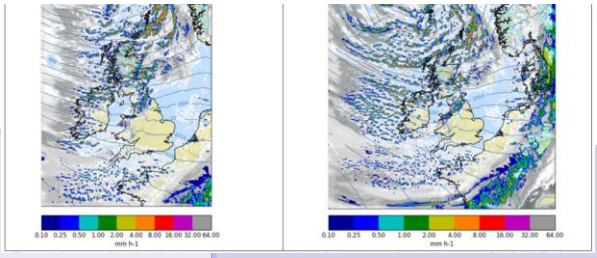
Model & Forecast

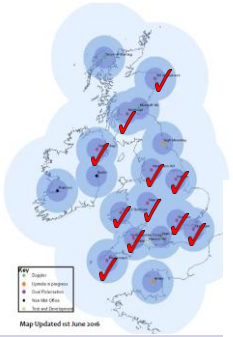
Model and observations improvements

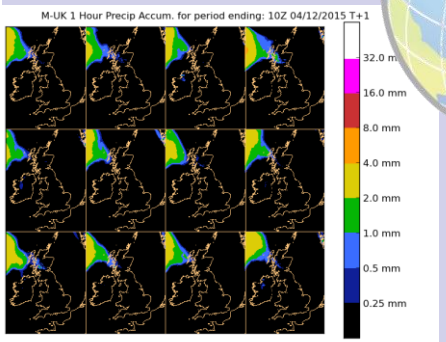
March 2016	November 2016	Spring 2017	2017	Autumn 2017	2018-19
Better use of observations Biggest improvement in a decade	Bigger UK domain Extend runs to 5 days Improved forecasts of showers	Global model resolution increase to 10km New UK hourly nowcasts	New radar network Precipitation type Doppler winds Increased resolution	Run UK ensembles to 5 days	Increased vertical resolution Couple atmosphere and ocean Better convection

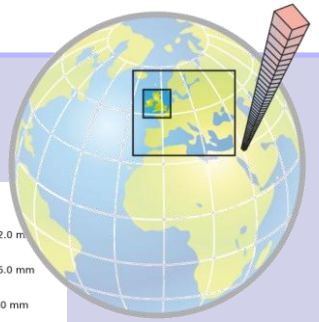


Improved showers









1.2 Pflops

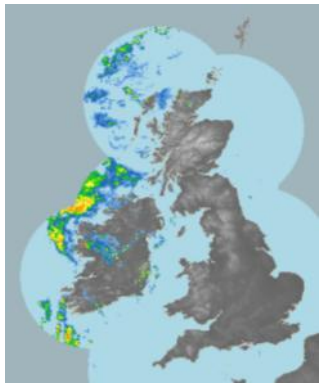
8 Pflops

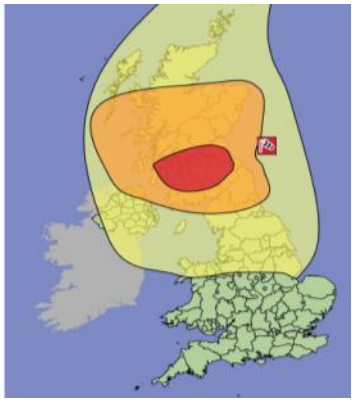
16 Pflops

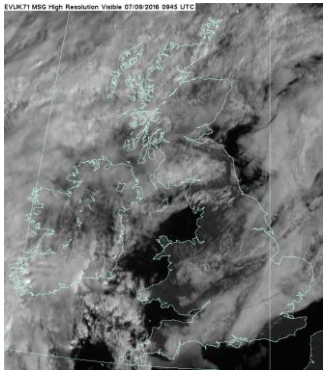
Interpret

Content and services

- Data
  - Gridded forecast data
  - Spot data
  - Observations
- Warnings and Guidance
  - National Severe Weather Warnings
  - Guidance
  - Scripts
- Forecaster/Meteorologist briefings
  - Verbal and web







24/7 support

© Crown copyright Met Office

Met Office

Produce

Services for the Information Economy - INSPIRE

Discovery	Catalogue
View	Visualisations
Download	Data downloaded as is
Transform	Reuse for interoperability
Invoke	Remote compute

© Crown copyright Met Office

Met Office

Produce

New ways of working

Met Office Informatics Lab

Analyst friendly
interactive notebooks

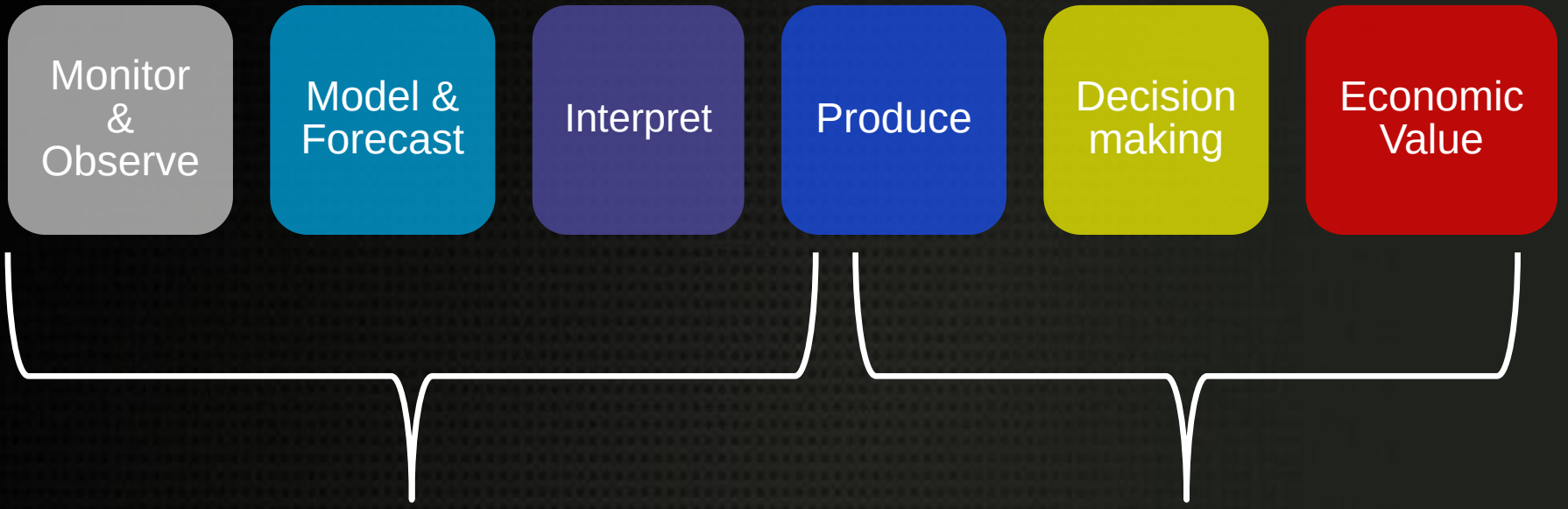
Massively scaleable
cloud infrastructure

Reproducible, transportable
work environments

Massively parallel data

© Crown copyright Met Office

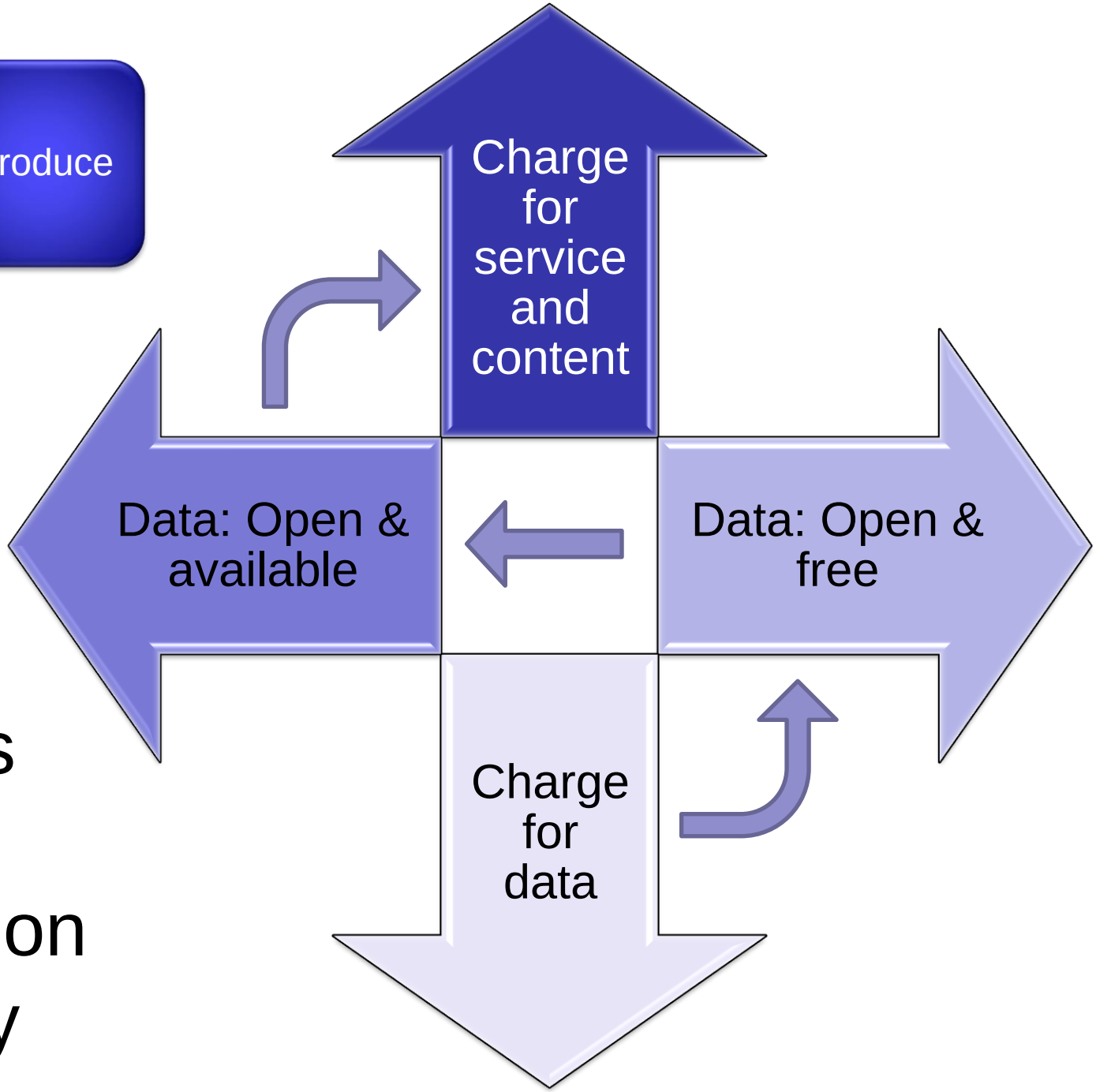
Weather Information Value Chain



© Crown copyright

Met Office

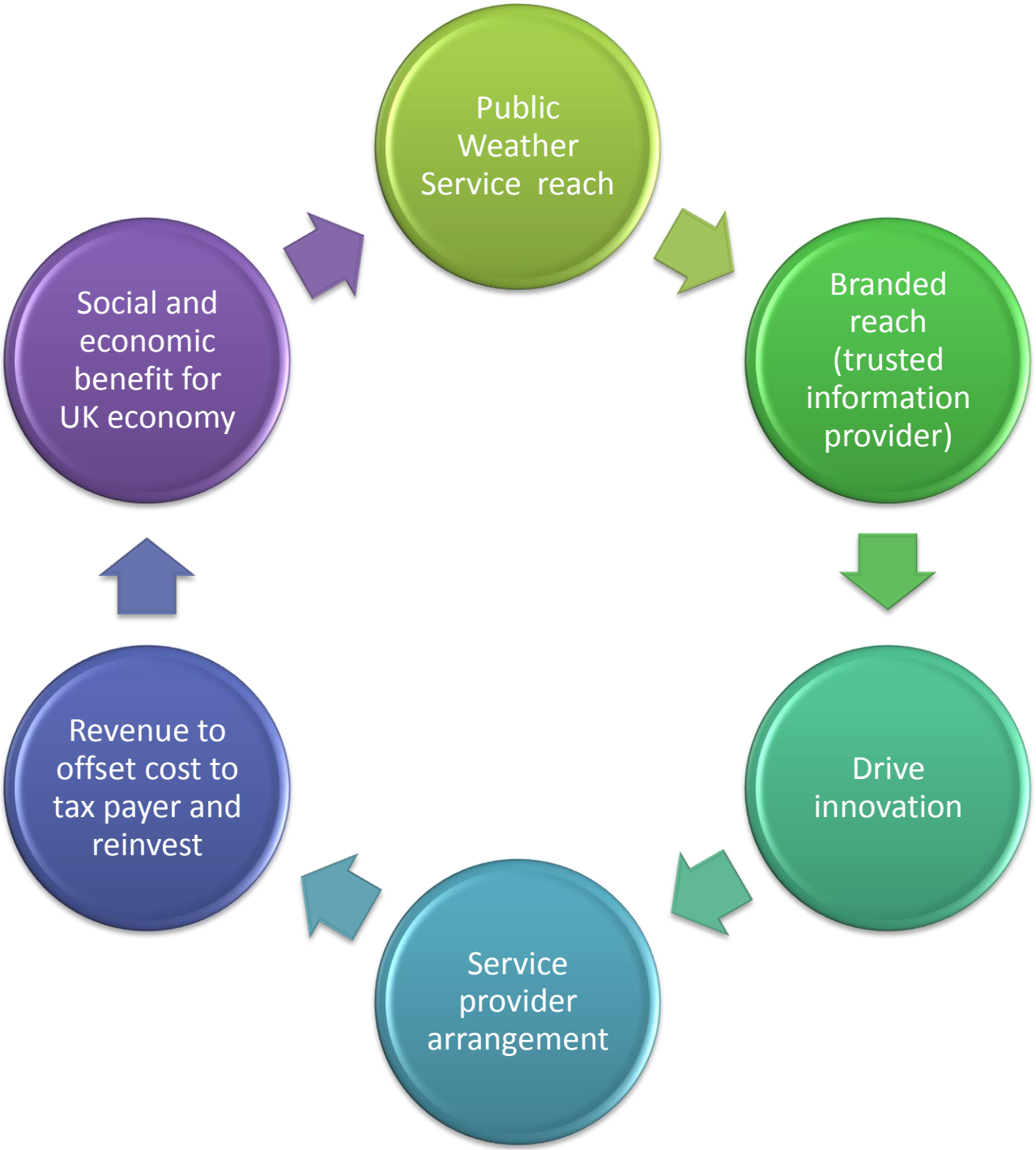
Produce



Changes in the information economy

© Crown copyright Met Office

Met Office drivers



© Crown copyright Met Office

Inconsistency

Public

Weather Forecast Services

Authoritative Warnings

Google

Yahoo

Amazon

BA

MeteoGroup

The Weather Channel

AccuWeather
SUPERIOR ACCURACY™

Met Office

DWD

Meteo F

NWS

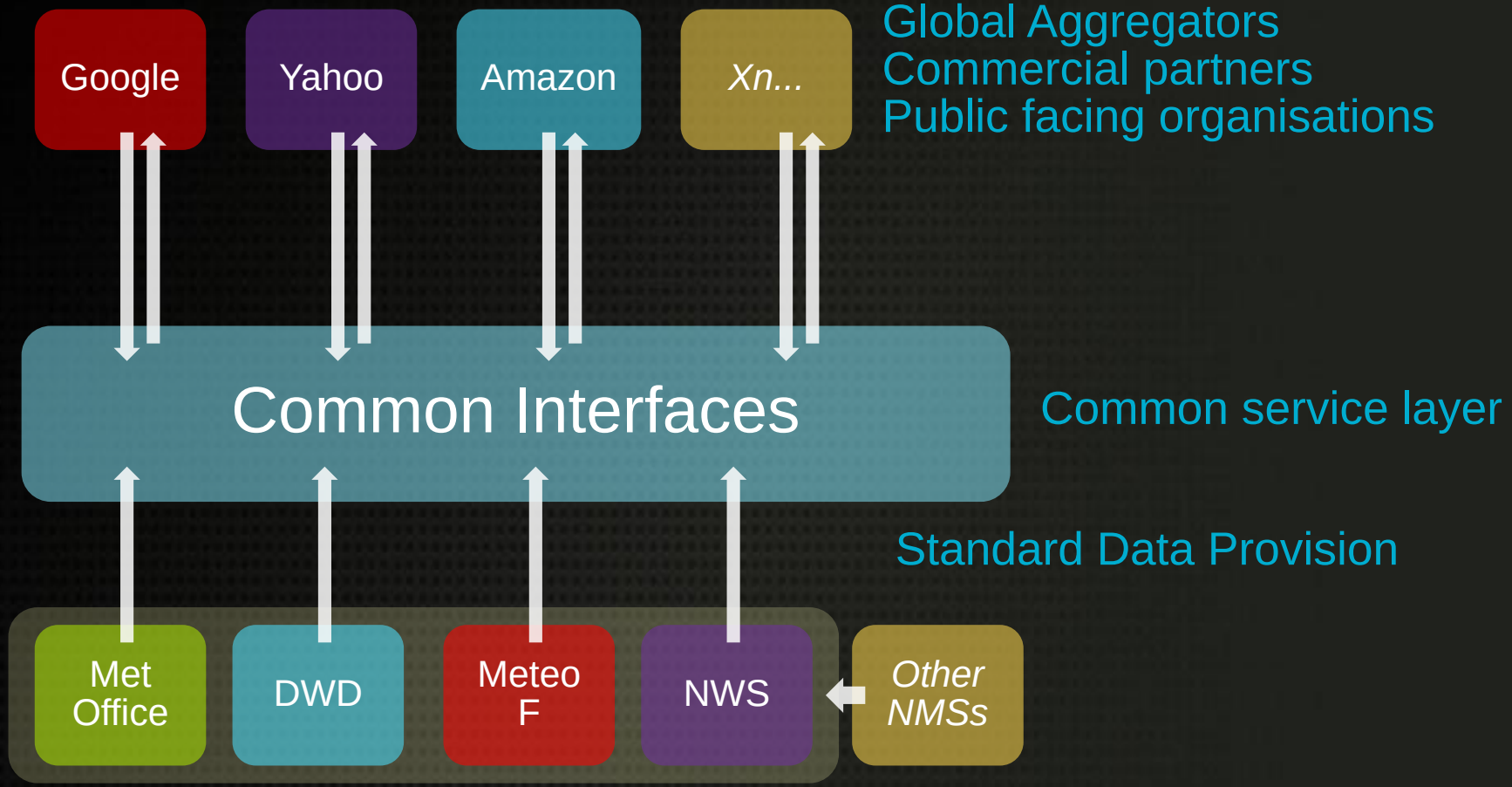
© Crown copyright

Open Weather - Purpose

- Maintaining the authoritative voice of NMSs
- Ensuring consistency between Warnings and forecast
- Supporting the global weather market
- Allowing seamless access to global weather from multiple NMS providers

© Crown copyright

Contextual Diagram



© Crown copyright

Weather Forecast Improvements at the UK Met Office:
Responding to the Big Data Challenge

Vicky Pope

January 2017

www.metoffice.gov.uk

© Crown copyright