



GLOBAL UNIFIED MODEL PARTNERSHIP

BIG DATA – BIG SCIENCE – A GRAND CHALLENGE

The global Unified Model Partnership brings together institutes from nine countries that use and develop the Unified Model – a world-leading seamless modelling system. The system underpins weather and climate science and services to reduce the risk from weather and climate.

Developing a “seamless” weather and climate modelling system requires the partnership to:

- Carry out world leading weather and climate science and translate this into a prediction system;
- Deliver technological developments that allow the effective and efficient use of rapidly evolving high-performance computers;
- Effectively use and manage the huge amounts of data becoming available from a rapidly changing and growing global observing network;
- Carry out valuable analysis of increasing amounts of data from the system.

Developing a “seamless” weather and climate modelling system is a key example of big data and big science and this needs to be tackled by an effective partnership.

What is the Unified Model

The Unified Model (UM) system is a suite of software and tools used for weather forecasting and climate projections at the global and regional scale. In its global form it can provide information on weather systems around the world and the links between them. In its regional form it can focus down and provide information on detailed weather and climate impacts at the kilometre scale.

The history of the partnership

The global UM Partnership provides a platform for scientific and technical collaboration on a shared modelling system for weather and climate projections. It leverages science and technical effort far beyond that possible from a single organisation. It formally began in 2014, building on a collaboration of UM users that dates back to 2007.

The technical programme

A key priority at its inception was to develop a common technical infrastructure, allowing scientists and software engineers to use common development tools. One such tool built to run and monitor complex modelling suites is Cylc, originally developed at NIWA, now an Open Source collaboration used beyond the partnership.



The science programme

The focus of the Joint UM Partner Science Programme is on model evaluation and development activities at global and regional scales. Recent contributions from partners include assessment of global science configurations over the Maritime Continent and development of an improved parametrisation of ice crystal growth improving our ability to simulate cloud in the southern hemisphere. Partners have also contributed to assessment of regional science configurations, case studies and trials over several domains around the globe, and development of an improved method of freezing rain in deep convective clouds.

Who's who

The partnership consists of core and associate partners who contribute financially and with dedicated human resources to ensure the Partnership delivers. Core partners make a larger commitment of effort and have a greater influence on the strategy. Many partners also have research partners in their country who also contribute to the development of the UM by utilising the model for their research activities in close collaboration with UM partners.

CORE PARTNERS		ASSOCIATE PARTNERS	
Australia	Bureau of Meteorology	Poland	ICM
	CSIRO	Singapore	MSS
India	MoES / NCMRWF	South Africa	SAWS
New Zealand	NIWA	United States	US Air Force
Republic of Korea	KMA		
United Kingdom	Met Office		

Making the partnership work

Membership contributions fund a dedicated UM partnership team who support and coordinate the efforts of the partners. This includes facilitating the planning of science and technology work; delivering technical infrastructure developments to make working together more effective; supporting the use of the system and delivering training activities. Workshops and scientist exchanges between partners further underpin the development of an effective collaborative science programme.

The support team can be contacted via UM_collaboration@metoffice.gov.uk.

