

The Story of ECMWF Special Projects

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Introduction

Special Projects are experiments or investigations of a scientific or technical nature, undertaken by one or more ECMWF Member States, likely to be of interest to the general scientific community. These projects enable scientists to access ECMWF's High-Performance Computing (HPC) and European Weather Cloud (EWC) resources, as well as the MARS meteorological data archive, fostering innovation and collaboration across institutions.

How it started

COUNCIL RULES FOR DISTRIBUTION OF COMPUTER RESOURCES TO MEMBER STATES

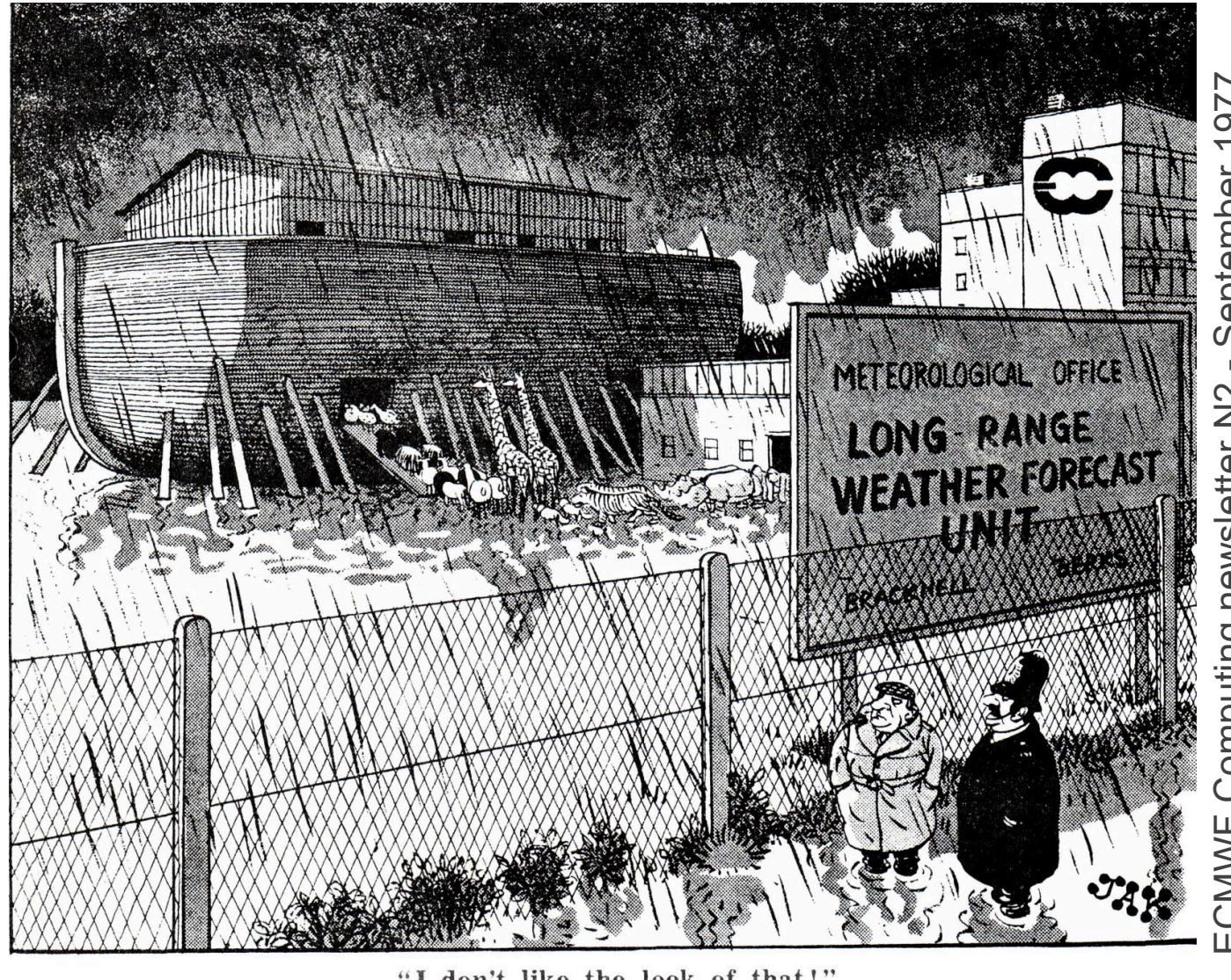
At its 8th session (21-22 November 1978) Council adopted, for a trial period of two years, a set of rules for the distribution of computer resources to Member States. These rules are given in ECMWF Computer Bulletin BL 2/1. Because Member State use of the Centre's computing system is only now beginning to approach that envisaged, the second TAC session (3-6 June 1980) considered that insufficient experience had been obtained on which to base radical changes to those rules. However, some minor amendments and additions were proposed, to increase the flexibility of the allocation system.

Council, at its 12th session (20-21 November 1980), agreed with this view, and so adopted the slightly modified rules, as given below, for a further trial period of 2 years. The changes from the previous rules are:

- Estimates are required by 31 March each year, not 1 July.
- Paragraphs (vi) and (vii) are added to give a limited degree of flexibility.

The new rules are:

- (i) at least 25% of the available CPU time of the Cray computer should be made available to the Member States;
- (ii) a maximum of 10% of the computer time available to the Member States may be allocated for "special projects" approved by Council; 35% of the remainder should be allocated equally among the Member States and 65% allocated proportionally to their financial contribution to the Centre. This method of allocation should only be used if the amount of time requested exceeds that available. In this case, if some Member States do not require the time allocated to them, that time should be reallocated (according to the above formula) to other Member States;
- (iii) each Member State should submit an estimate, by 31 March each year, of its computing requirements on the ECMWF computer system for each of the three following years. If any "special projects" are included, details of these are also to be submitted by 31 March;
- (iv) no charge should be made to the Member States for use of the Centre's computer time;
- (v) the Centre should continue to give a series of training courses, designed to train a few people from each Member State in the use of the Centre's computer system;
- (vi) if a request is received from a Member State for an increased allocation of computer resources, the Director, after consultation with the Chairman of the Technical Advisory Committee, may alter the allocation to that Member State, provided that, first, the total allocated to all Member States does not exceed the annual total laid down by Council; secondly, that the resources allocated do not exceed that which would be available to that Member State if the annual total were distributed among Member States according to the formula determined by the first sentence of recommendation (ii);
- (vii) if a Member State, in the light of experience during the actual year, finds that its use will not meet the resources allocated, modified estimates should be submitted to the Centre to allow for reallocation of the resources, thus ensuring an efficient use of the computer resources of the Centre.



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But not before the first supercomputer arrived!

AN EVENT IN THE COURSE OF A TYPICAL WORKING DAY!

In the early hours of the 3rd October, a Boeing 747 flew over Heathrow on schedule from New York, carrying cargo. Amongst this cargo was the long-awaited and very precious Condensing Unit for the CRAY-1 computer which weighs about one and a half tons. To the surprise of those who had meticulously arranged the careful landing of the aircraft, the flight agency that was responsible for getting the delivery, devised a special method of unloading the said precious article. This method was devised to refresh the expertise of those members of the 747's crew who had been on active service. It was decided to have a bomb aiming practice on the unloading bay, using our Condensing Unit for the target. To facilitate the unloading, a gas cylinder was used. The mission was a success and the bomb arrived dead on target, all 14 tons of it. Also the pains of this mission were too much for the poor Condensing Unit which burst at the seams and transformed itself into a tangle of twisted metal.

The enemy on the ground were taken by surprise as the gas leaked and evaporated. The next move was for the ground staff to manoeuvre the tangled mess into a hanger where it was left to exhaust its gases. The hanger was then evacuated. Also the fire engines were called to start the engines but this was not a good idea due to the presence of the gas. At this stage it became clear that the mission had not been such a success after all.

However, the story has a good ending as 3 whole weeks later, another Condensing Unit arrived safely together with the interim CRAY-1 system which was transferred to the Rutherford Laboratory without a single hitch - unbelievable!

-- Eric Walton
Number 3, page 5
October 1977

Where it's going

Proposal

ECMWF is proposing to update the process to handle Special Projects' requests by:

- Having a dedicated allocation in addition to the Member State computing resources. This dedicated allocation would remain equivalent in size to 10% of the resources allocated to Member States;
- Widening the eligibility of applications to EMI entities (including Co-operating States, EUMETSAT, and EUMETNET)
- Delegating approval of such requests to SAC and TAC in order to maintain oversight by Member States, while making optimisations to the process
- Renaming the activities "EMI R&D projects"

The main advantages of this proposal are:

- Member States maintain approval of Special Project requests via the TAC
- Fully aligned with the handling of EUMETSAT R&D calls
- Potential to make HPC and storage resources directly available to Special Projects from Co-operating States (at present, it is possible for Co-operating State users to apply for a Special Project via a Member State), and other EMI entities (EUMETSAT and EUMETNET)
- Decoupling of Member State and Special Project resources simplifies the allocation and reporting procedure
- Equal handling of all applications, resulting in a fairer and more transparent process
- Potential to shorten the time between application and project start by delegating approval to TAC
- Reduced workload in all Member and Co-operating States
- Higher potential for further efficiency gains in application handling through software solutions

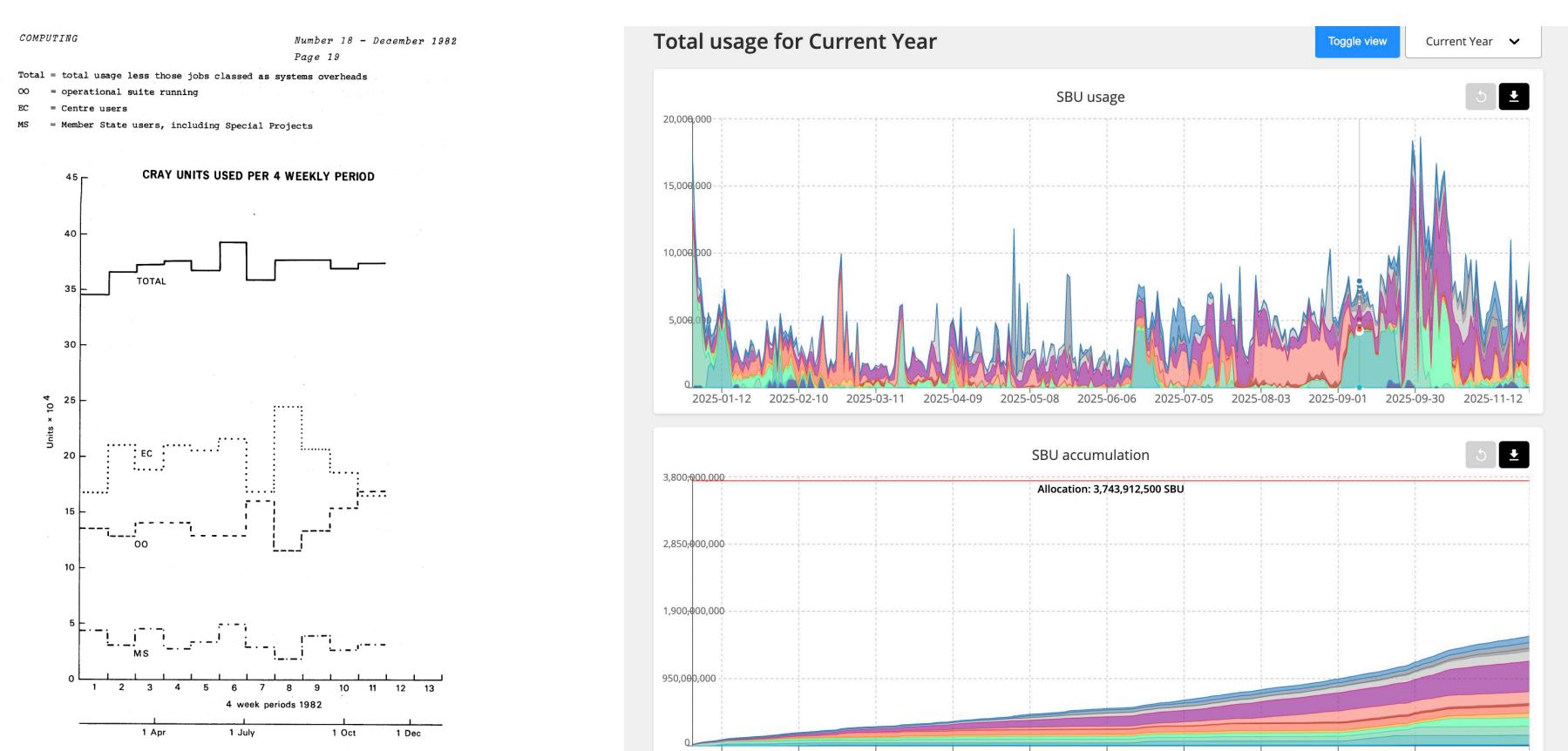
In general, MS/CS are still encouraged to provide direct access to ECMWF computing resources to any relevant party in the Member States.

With this proposal, the ECMWF computing resources will be available to Member States and Co-operating States, and the distribution of computer resources will be more efficient and transparent. The original guidelines are in Annex 2.

Will it be accepted?
We'll know tomorrow!!!

Then and now

Use of ECMWF computing resources



1982: Printed in Newsletter

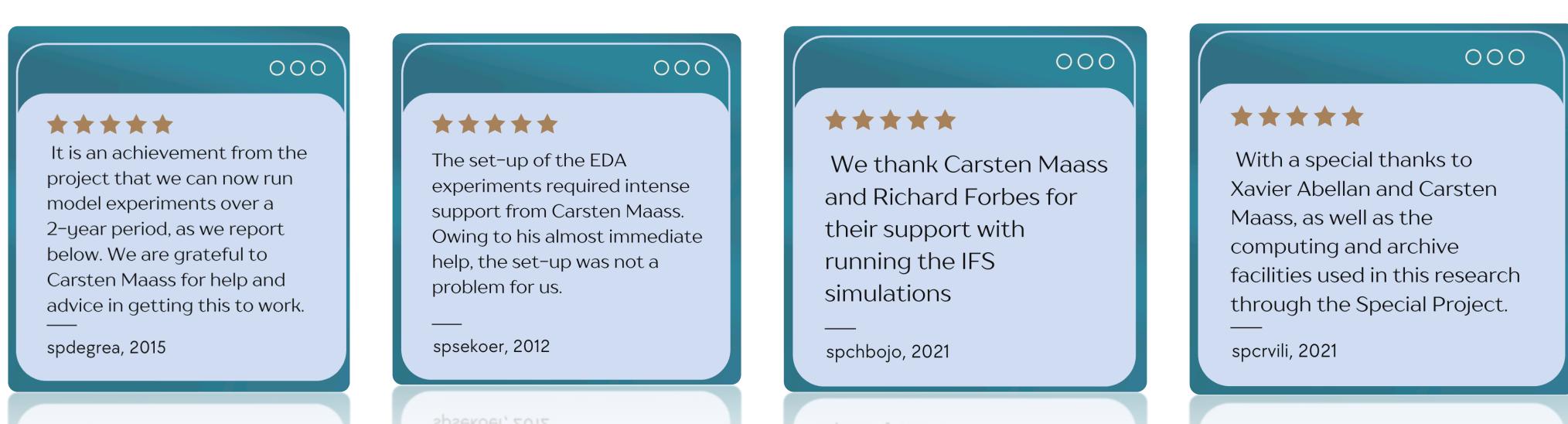
2025: Shiny web app

Number of Special Projects over time

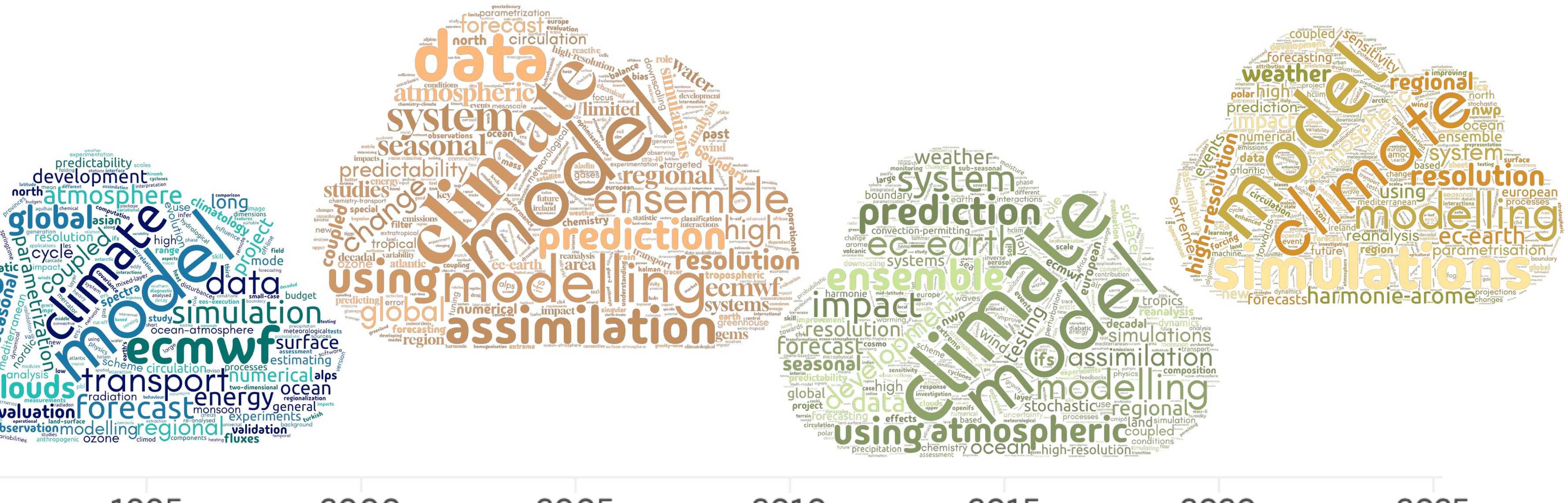


Carsten Maass – quietly powering ECMWF's Special Projects

For more than twenty years, his steady guidance and practical help supported hundreds of researchers across Europe in making the most of ECMWF's computing and data resources



Dominating topics over decades



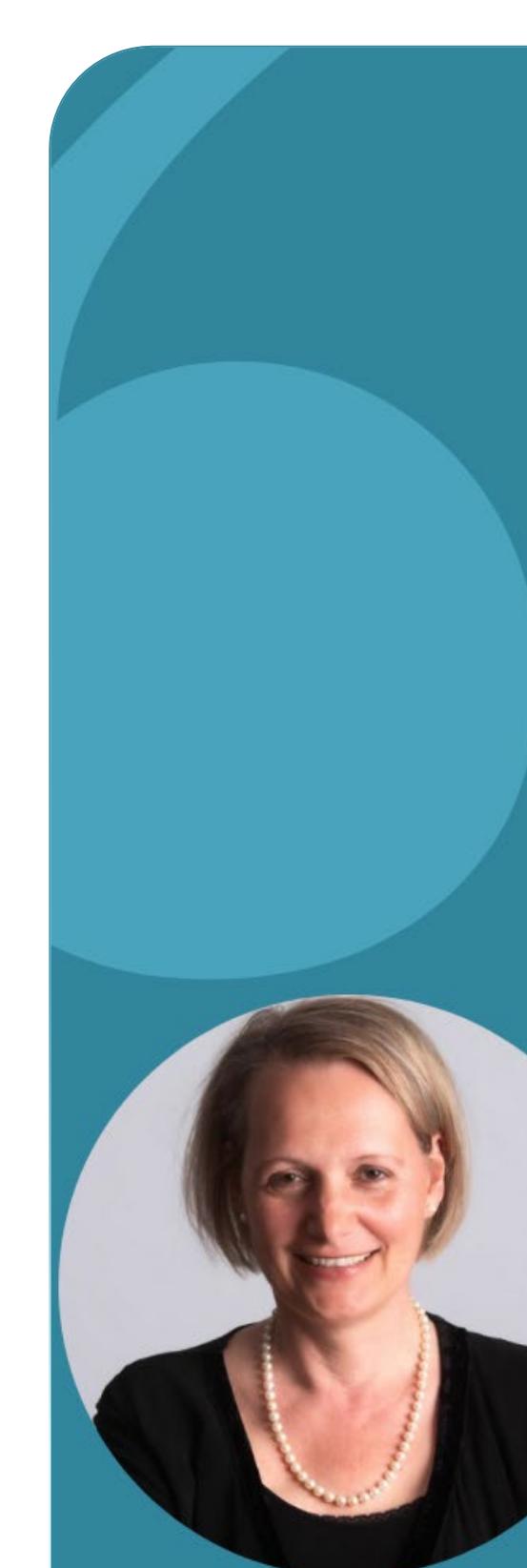
1990 1995 2000 2005 2010 2015 2020 2025

Testimonials

ECMWF Special Projects have been absolutely instrumental to our group's work for almost 15 years. Having direct access to ECMWF's supercomputing and archival resources transformed what we could attempt: from running large ensembles of multi-decadal hindcasts to testing sensitivities to external forcings such as CO₂ and aerosols, from exploring computationally expensive coupled attribution experiments with a state-of-the-art forecast model to developing reduced precision versions of the IFS that simply wouldn't have been feasible elsewhere. The Special Projects route enabled fast, accessible science that connected our university research directly to operational modelling advances at ECMWF. These experiments have fed into peer-reviewed studies and, in several cases, operational improvements and methodological advances shared with the wider community.



Antje Weisheimer



“
My experience was very positive. The application and general administration procedures are nice and straightforward, minimal overhead.
spclcl2

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The use of the ECMWF HPC Facilities was very important to complete successfully the joint CMEMS research project mentioned above. All administrative issues were easy to follow.
spgrver

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The framework worked very smoothly overall. It would be great if other members of a research group were able to share storage space allowance instead of only computing time. That would make the workflow of a research unit much more streamlined. Also writing and retrieving from tape could be made a bit easier, especially by creating commands that allow moving multiple folders together.
spitbell

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The experience with the application and submission has been straightforward. Besides, the staff at ECMWF kindly helped assist with any problems.
spitmecc