

REQUEST FOR A SPECIAL PROJECT 2016–2018

MEMBER STATE: ... ITALY

Principal Investigator¹: ... Dr. Adrian Tompkins

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Other researchers: External Organisations are specified below. These organisations will access processed forecast fields for analysis and validation but will not require access to ECMWF computing facilities. The task of conducting sensitivity experiments and data access on MARS will be solely conducted by ICTP.

Project Title: Use and value of ECMWF short-range and seasonal forecast products for health impacts in developing countries

Computer resources required for 2009-2011:	2016	2017	2018
High Performance Computing Facility (units)	400,000	400,000	400,000
Data storage capacity (total archive volume) (gigabytes)	200	200	200

Is this a continuation of an existing project?	YES <input checked="" type="checkbox"/>	NO
If YES, please state the computer project account assigned previously	SPITP4DC (cpa, cpg)	
Would you accept support for 1 year only, if necessary?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>

*An electronic copy of this form **must be sent** via e-mail to: special_projects@ecmwf.int*

Electronic copy of the form sent on (please specify date):06/06/2015.....

Continue overleaf

¹ The Principal Investigator will act as contact person for this Special Project and, in particular, will be asked to register the project, provide an annual progress report of the project's activities, etc.

Extended abstract

(It is expected that Special Projects requesting large amount of computer resources should provide a more detailed abstract/project description including a scientific plan and a justification of the computer resources requested)

1. Extension to SPITP4DC: the main objectives concerning health

This project is an application for a follow-up project to the second phase of “*Use and value of ECMWF short-range and seasonal forecast products for developing countries in terms of end-user impact variable*” which ran from 2013 to 2015. In phase two of the project, considerable work has been done examining the potential of driving health models, in this case a malaria model, with extended-range EPS and seasonal SYS4 forecast data. Most of the original targets outlined in the application of 2012 have been achieved. The full seamless system was described in an Amer. Met. Soc article in 2015, and has been verified with health data in Rwanda, Uganda and Malawi. The system is moving towards an on-the-ground evaluation in a “hind-cast mode” by the ministry of health in Uganda during 2015.

This application is for a continuation of the special project to ensure continuity of our interaction with potential end users in the health sector in Africa. In terms of research and systems development the aims would

The special project phase 3 would focus on the following aims

- a) Complete the evaluation of the IFS-VECTRI malaria forecasting system in Uganda and carry out similar with colleagues in Senegal as per data availability.
- b) Upgrade the VECTRI model version in the system to include improved biting rates and (if time permits) couple the system to the WISDOM population model.
- c) Develop products that may be useful for the end-users in Uganda and further countries as deemed appropriate. This is the key focus of the second phase of the project, as our experience in the second phase of the project is that it is extremely difficult to understand and subsequently incorporate climate-related information into the health system decision process effectively. This step will be approached with a extended visit to Uganda/Senegal by the project PI to work on effective policy integration with local partners.**
- d) Examine ways of improving the IFS skill over the target regions. In addition to post-processing techniques, we intend to evaluate if key IFS parameter settings (such as CAPE timescales) could be optimally adjusted to improve temperature and rainfall prediction skill over the target area using so-called genetic algorithms. This could turn out to be of more general relevance to improving forecast skill of the IFS.
- e) There is currently a version of VECTRI under development to model dengue transmission. If this code is operable within phase 3 of the project, investigations will be made concerning the prediction of dengue over seasonal timescales with partners in the health sector based in India. There is also the possibility to subsequently generalize the code to account for lymphatic filariasis, which is transmitted by similar vectors to malaria.

The end-goal of the project is to demonstrate the direct potential of the IFS to end users in the health sector in developing countries, particularly in, but not restricted to, Africa.

We have requested a limited amount of supercomputing units to be able to conduct ECMWF sensitivity tests as deemed necessary and also to carry out the investigations regarding the ECMWF IFS optimal parameter setting.

2. Collaborations of Opportunity:

Using the resources requested under SPITP4DC, a number of side projects were conducted during phase 2 concerning the development of the IFS, which were directly useful to ECMWF. As an example, developments were made to new parameterizations concerning the treatment of cloud overlap in the IFS radiation scheme, during which the SPITP4DC PI also identified and corrected a number of coding errors, in addition to substantially improving the overlap code efficiency. In phase 3, we would aim to continue these side interactions which would be greatly facilitated by the special project.