

# SPECIAL PROJECT PROGRESS REPORT

Progress Reports should be 2 to 10 pages in length, depending on importance of the project. All the following mandatory information needs to be provided.

**Reporting year** .....2017.....

**Project Title:** Evaluating land surface model uncertainty and strategies for improved forecast skill

**Computer Project Account:** SPGBCLOK.....

**Principal Investigator(s):** Professor Hannah Cloke  
Professor Anne Verhoef

**Affiliation:** University of Reading  
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**Name of ECMWF scientist(s) collaborating to the project** .....  
(if applicable)

**Start date of the project:** ...2016.....

**Expected end date:** ...2018.....

**Computer resources allocated/used for the current year and the previous one**  
(if applicable)

Please answer for all project resources

|  |          | Previous year |       | Current year |         |
|--|----------|---------------|-------|--------------|---------|
|  |          | Allocated     | Used  | Allocated    | Used    |
| <b>High Performance Computing Facility</b> | (units)  | 250000        | 10.24 | 250000       | 27730.9 |
| <b>Data storage capacity</b>               | (Gbytes) | 3000          | 9     | 3000         | 19      |

## Summary of project objectives

(10 lines max)

Improving the skill of forecasts of floods, droughts and other natural hazards driven by numerical weather prediction requires developments in land surface modelling (LSMs). Particularly important is the representation of soil moisture, infiltration and runoff processes and the feedbacks to the energy cycle. For drought prediction this is particularly important at the seasonal forecasting scale. Here we evaluate land surface model uncertainty and strategies for improved forecasts skill using CHTESSEL, JULES and other LSMs driven by forecasts over a variety of time horizons.

## Summary of problems encountered (if any)

(20 lines max)

Staffing changes – minor impact.

Difficulties in implementing the test infiltration algorithms in test suite of JULES has meant that the anticipated simulations on this component of the project have not been undertaken.

## Summary of results of the current year (from July of previous year to June of current year)

CHTESSEL runs have continued for evaluation of drought indices over the UK, particularly considering seasonal timescales. Trial results have also been obtained for evaluation of the UTCI indices for extreme temperature health hazards and the uncertainties based on ECMWF medium-range ensemble and reanalysis.

## List of publications/reports from the project with complete references

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None yet.

## Summary of plans for the continuation of the project

(10 lines max)

- Consideration of higher resolution datasets and comparison of reanalysis and forecasts, links to uncertainty and vegetational factors.
- Further understanding of how land surface uncertainties may translate into EFAS and GloFAS forecasts.
- Possible compilation of JULES and rerunning drought test cases in intercomparison.
- Europewide pilot operational ensemble UTCI forecasts driven by the ECMWF medium range ensemble and analysis based on case study cities, comparison with observed data and reanalysis and skill evaluation where possible.

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