**CONSTRUCTION OF CLIMATE SCENARIOS FOR THE INTEGRATING FRAMEWORK: DELIVERABLES AND METEOROLOCIAL DATA**

**Partners**

Climatic Research Unit (CRU), University of East Anglia
Water Resource Systems Research Laboratory (WRSRL), University of Newcastle
Hadley Centre

**Deliverables**

- D1 and D2 from CRU: Daily and hourly time series of precipitation, min/max temperature, vapour pressure/relative humidity, sunshine duration, wind speed and PET for 3-5 case-study locations.

- WRSRL deliverables - D1: Example of model output. D3: Software package to run the GNSRP model for any given UK location (at a 5 km resolution) in order to produce precipitation scenario time series at daily, hourly or 15 minute time resolution and of any length (e.g., 10, 1000, 10,000 years) for the present-day and the future.

- Hadley Centre deliverable D4: A report describing the analysis of changes to urban and rural temperatures and extremes, and humidity.

All project deliverables will be made available *via* the project web site. All deliverables will be restricted for use by members of the programme projects initially, but deliverables D1-D2 and D4-D5 will be made publicly available at the end of the programme, again *via* the project web site.

**Deliverable and meeting dates**

| | |
|---|---|
| **D1:** Examples of WG/GNSRP model output for testing impacts models | July/December 2003 |
| **D2:** Daily/hourly scenarios for 8 variables for 3-5 representative case-study locations | April 2004 |
| **D3:** Software package to run the GNSRP precipitation model for any given UK location | April 2004 |
| **D4:** Report describing the analyses of changes to urban/rural temperature and humidity | April 2004 |
| **D5:** Technical briefing notes on issues such as the models used and underlying assumptions, uncertainties and confidence limits, and guide to good practice in scenario use | December 2003<br>April 2004 |
| ***Workshops/project progress meetings*** | |
| **W1**: Main focus: to make final decisions about the deliverables, based on end user requirements | 22 May 2003<br>Norwich |
| **W2:** Main focus: to present the final scenarios and provide advice on scenario use | May 2004 |
| **M1/M2:** Project progress meetings | September 2003<br>March 2004 |

**Project tasks**

***Tasks 1-5: CRU weather generators (WG) and work on storm-track changes***

***Task 1:*** Modification and updating of the daily WG focusing on the development of generic, user friendly, efficient subroutines for perturbing the parameters in climate change studies.

***Task 2:*** Development of methodologies for perturbing the WG parameters based on the UKCIP02 scenarios and to quantify some of the uncertainties relating to emissions scenarios and inter-/intra-model variability.

**Task 3:** Improvements to the daily WG, focusing on secondary variables such as vapour pressure/relative humidity, sunshine and wind.

***Task 4:*** Development of the hourly WG.

***Task 5:*** Development of wind scenarios based on storm-track changes.

***Tasks 6-11: WRSRL specialised rainfall scenarios***

***Task 6:*** Set up the GNSRP model for the whole UK using the MetOffice/UKCIP 5 km climatology. This will allow long rainfall series to be generated for any site in the UK.

***Task 7:*** Parameterise the GNSRP model to match observed 1961-1990 return periods (e.g., 10 or 25 year annual maxima) for daily rainfall.

***Task 8:*** Parameterise the GNSRP model for the whole UK for future climates, also at 5 km, incorporating trend analysis and regional frequency analysis of HadRM3 from the SWURVE project.

***Task 9:*** Reparameterise and validate the GNSRP model for hourly and 15 minute rainfall consistent with daily totals (present/future) using observed sub-daily time series and statistics.

***Task 10:*** Interface from GNSRP model to CRU daily WG.

***Task 11:*** Extend model to allow for changing proportion of convective/frontal rainfall in future climate (e.g., from HadRM3), i.e., allowing for increased variance, more intense rainfall etc., using 'storm type' parameter sets as has been done previously for a hierarchical model based on 'weather types'.

***Task 12: Development of scenarios of climate change in urban areas (Hadley Centre)***

***Task 13: Workshops, dissemination and ongoing support/advice in the use of climate scenarios (ongoing to the end of the programme in March 2005)***

**Availability of appropriate meteorological data for potential case-study locations**

The CRU daily and hourly weather generators require observed data for model calibration and validation. The main sources of data will be the CRU archives, British Atmospheric Data Centre (BADC) and publications such as the European Solar Radiation Atlas. The locations in the table below are all listed as possible case-study locations in the 'Progress report on case studies and data sets' prepared by UKCIP. The stations for which appropriate meteorological data are known to be available are listed in the right-hand column of the table.

**Potential case study locations and availability of meteorological data**

| Location | Projects | Meteorological data availability |
|---|---|---|
| SE England | H, U, P | Hembsy, Honnington, Wattisham<br>Manston<br>Herstmonceaux, Shanklin, Ventnor |
| W Scotland | E, H, R, D | Abbotsinch (Glasgow)<br>Prestwick |
| Isle of Wight | R | Shanklin, Ventnor |
| Greater Manchester | U, P, D? | Ringway |
| London | E, D | Heathrow |
| Lewes | U | Herstmonceaux |
| Birmingham | E | Elmdon |
| Offshore | E | |
| SW England | E | Exeter, Chivenor, Plymouth<br>St Mawgan, Yeovilton |
| S Scotland | R | Eskdalemuir, Edinburgh Turnhouse |
| W Yorkshire | D | Bradford, Leeds |

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**21 May 2003**