BALTEX Cloud Liquid Water Network: CLIWA-NET

First quarterly report

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Overview

During the first 3 months of the CLIWA-NET project the kick-off workshop was the most important event. The workshop was organised at Texel, The Netherlands from April 5-7. Here the foundations for the obserational plan were developed in such a way that concerted preparations for the first CLIWA-NET campaign (CNN I) in August/September 2000 by the partners are underway now.

The CLIWA-NET web site has been set-up and can be found at http://www.knmi.nl/samenw/cliwa-net

Highlights of the quarter

Progress Report WP2000: Ground Based network

- Instrumentation

The instrumentation at each station within the ground-based network has been agreed upon. Additional sensors, which will complete the instrumentation at several stations, have already been shipped (2 lidar ceilometers) or will be shipped within the next weeks (infrared radiometers). A description of the stations including the description of the single instruments has been compiled and can be viewed via the CLIWA-NET home page.

- Sampling strategy

The data taking strategy during the CNN campaigns was extensively discussed. The satellite overpasses will give the time schedule for the operation of the instruments, which can't be operated unattended (e.g. cloud radar). Wherever possible all instruments will be operated zenith pointing to get a homogenous data set without azimuth dependence. Active instruments will be pointed of slightly (5 deg) to avoid reflection effects. Time resolution will be as short possible but not finer than 1 s.

- Data format and transfer

A data format has been defined which will be used for all measurements during the campaign. Currently the different partners are preparing example files. Starting with them the data base will be set up for operational processing, which will enable the smooth run and online availability during the campaigns. The algorithm development for the LWP retrieval has been started by performing extensive radiative transfer calculations.

Progress Report WP 3000: Satellite remote sensing and integration of observations

The following sub-workpackages have been addressed:

- Availability of satellite data and definition of data formats (KNMI, SMHI, IfMK)

During the CLIWA-NET EOPs cloud liquid water path (LWP) will be inferred from the microwave radiometers AMSU onboard NOAA15 and SSM/I on board DMS/P, as well as from the solar/thermal multichannel radiometer AVHRR onboard NOAA12, NOAA14, and NOAA15. It is planned to add NOAA16 (launch: August 2000) for forthcoming EOPs because if its favourable afternoon orbit. The unprocessed NOAA data (HMF-format) are archived by SMHI. Calibration and navigation of the raw satellite date will be performed at SMHI and at IfMK with the help of the AAPP software distributed by EUMETSAT. Calibrated and navigated SSM/I and AMSU data are available from NASA's

Satellite Active Archive Center. An observational plan for the satellite overpass times at the CLIWA-NET ground stations for the first EOP (August/September 2000) is on its way.

- Availability of remote sensing algorithms (KNMI, IfMK)
LWP retrieval from AMSU brighness temperatures are based on classical regression algorithms as described in the literature. SSM/I data are transformed into LWP by means of neural network algorithms developed at the IfMK. LWP from AVHRR reflectance measurements is obtained from the KLAROS scheme developed at KNMI. This scheme requires surface reflectivity maps for the region under consideration. A reflectivity map for the BALTEX area will be provided by SMHI. A Linux version of the KLAROS scheme has been installed at the IfMK and processing of data is under way. The format for KLAROS input data still needs to be clarified. First approximate intercomparisons of liquid water paths retrieved from co-located AMSU and AVHRR data (both NOAA15) over open ocean areas have been performed at IfMK and show a generally good agreement. Problems are expected for intercomparisons within the BALTEX area due to land contaminations within the AMSU radiometer field of view.

- Integration of surface observations into the satellite data (KNMI, IfMK)
Adjusting the satellite based LWP estimates to the ground based measurements is rendered difficult by the fact that one needs to quantitatively compare spatial (satellite) with temporal (ground station) pattern which both obey a strong degree of irregularity. Therefore, it is planned to perform a comparison by means of both classical statistical and spectral analysis. The corresponding tools have been installed at the KNMI. A first spectral analysis has been performed with collocated AVHRR data and ground based microwave radiometer measurements obtained during the field experiment CLARA'96. The results show that a meaningful comparison of spatial and temporal LWP retrievals requires a minimum of 2000 data points in each data set.

Progress Report WP4000: Model evaluation/Improvement
Kickoff workshop discussions on model evaluation/improvement (WP4000) focused on the formulation of a list of model parameters to be exported in time series and/or field format by the atmospheric models involved in the project during the observational campaigns. Further discussions were dedicated to the implementation of research items like the role of horizontal resolution to model cloud parameters and the parameterization development of cloud processes. Concerning the latter it was agreed upon that the Rossby center deals with the cloud overlap issue. Temporary staff was recruited at KNMI to contribute to WP4100/4300.

As an outcome of the Kickoff Workshop a document is formulated containing a comprehensive list of specifications concerning the timeseries format of model output intended to be used in the model evaluation (WP4100). After a few iterations with the institutes participating in WP4000 a final version of this document was established. The document is available on the CLIWA-NET internet-page and will be part of the kick-off workshop report.

Problems encountered
Non

Significant departures from the Description of Work
It was decided to have separate consultation meetings with each member of the User Advisory Group. These meetings are planned for the second half of 2000. The results of these meetings will be incorporated in the User Requirement Document (planned delivery date January 2001).

Upcoming meetings
CNN1 Workshop scheduled in Bonn on 14 and 15 December 2000