Geophysical Research Abstracts, Vol. 8, 03406, 2006
SRef-ID: 1607-7962/gra/EGU06-A-03406

A Model to determine desirable Properties of Precipitation Predictions for operational Use in Polder-Boezem Systems in the Netherlands

R. R. P. van Nooyen

Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, The Netherlands (r.r.p.vannooyen@tudelft.nl / +31-15-278 6503)

Nearly half of the land area of the Netherlands lies below sea level. Operational water management in this area faces special challenges due to the constant need to balance economical viability of solutions versus the cost of system failure. This has resulted in a system that has water storage capacity and pumping stations that can cope with normal rainfall, but faces severe problems when confronted with heavy (50-100 mm in one day is heavy by Dutch standards) rains.

The land below sea level is partitioned into management units of 1000 to 3000 square kilometers containing a number of polders, a “boezem” and “boezemland”. The polders vary in size, typically between 1 and 20 square kilometers. The polders pump their drainage water into the “boezem”, a network of canals and in some cases small lakes. The same network collects run-off from higher areas, the “boezemland”.

The current system uses weather predictions to improve behavior during extreme events. If heavy rains are predicted then, based on expert knowledge, additional storage is created by deviating from the normal water level. There are economic and technical limits to the size and duration of this deviation. These limits and the small scale of the systems when compared to the scale of conventional precipitation predictions make this procedure difficult; one may even question its effectiveness.

The model to be presented uses limits on water level deviations, the areas of different system components and information on pumping capacity in the system to derive a first estimate of the needed prediction horizon, accuracy and spatial resolution.