Drought Research Initiative 1st Annual Workshop

Saskatoon, Saskatchewan - 11-12 January 2006

Breakout Sessions

Theme-3 - *Assess and reduce uncertainties in prediction of drought*

Questions:

How well was the recent drought predicted?

What are the key processes in the prediction?

How do we contribute to better prediction?

Need to focus on 1999-2004 drought over Canadian prairies

Notes of discussion

Parameters:
Precipitation: save 4 times per day
Streamflow, runoff, baseflow, SH, LH, radiation
Prepare list of variables that need to be saved in HFP and CRCM runs
Diagnosis on line could save time
Derived variables: PDSI, SPI, …
Focal point: start/end of drought (2005 pluvial)

Models: (up to seasonal time scale, dynamical models)
HFP (GCM3/CLASS): non-stationary contributing areas is an aspect unique to prairies, and could be a new paradigme for modeling in the prairies
US Drought Monitor is based on observation with no predictive capability
Should look at US predictive models: NCAR, GFDL, …
Model-model and model-observation evaluation

Processes:
Groundwater model: coupled to CLASS, verification using well data, possible study site is South Saskatchewan River Basin (well studied and well-monitored – links to Theme 1 on data availability)

Land surface schemes (e.g., CLASS) run at stand-alone mode to eliminate errors in met data, before running in coupled mode

Snow cover anomalies (extent and SWE), microwave data is at coarser resolution than contributing areas, gamma flights provide good data

US LDAS (Land Data Assimilation Project), add CLASS as fourth LSS? Find out about CalDAS?

Soil moisture anomalies: initialization in GCM3/CLASS HFP framework using previous season's forecast

Crop phenology: comparison of Raddatz' crop model with CLASS (HAL lab to do?) to examine ET and atmospheric convection, areal extension to Alberta?
Irrigation effects on ET? Some data on water use available, output from water use and crop models available as well (US study over Nebraska, Ken Hubbard, shows effects of irrigation on atmosphere on local scale)

Land use change (different crops planted) effect on regional ET?

Stationarity assumed in models on irrigation, land use and crop phenology; quantify and assess importance

Geographical study sites need to be determined according to availability of data (including satellite)

Idealized sensitivity studies with LSS to assess effects of crop phenology, irrigation, land use change

RCM – sensitivity studies to changes in surface properties (e.g., leaf area index)

GCM3 column model – time dependent surface forcings more characteristic of observed changes

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