DRI Prairie Hydrology Workshop

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DRI Prairie Hydrology Workshop
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UNIVERSITY OF SASKATCHEWAN

Prairie Hydrology Workshop

UNIVERSITY OF SASKATCHEWAN
MARQUIS HALL, 97 CAMPUS DRIVE
SASKATOON SK
WEDNESDAY, NOVEMBER 18, 2009
(8:00AM - 5:00PM)

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THIS WORKSHOP WILL FOCUS ON:

- Prairie Drought Hydrology - for example DRI and related research
- Prairie Hydrological Modelling (including wetlands and ungauged basins)
- Prairie Hydrometeorology (including extreme hydrological events)
- Saskatchewan water availability

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AS WELL AS TECHNICAL PRESENTATIONS, THERE WILL BE DISCUSSIONS ON:

- Drought Hydrology
- Prairie Hydrological Modelling (including wetlands)
- Assessment and vulnerability of Saskatchewan's water availability

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The Workshop is technical in nature, however those with policy and other water interest are welcome to attend.

This workshop is supported by:

UNIVERSITY OF SASKATCHEWAN

CENTRE FOR HYDROLOGY

DRI
DROUGHT RESEARCH INITIATIVE

Who?

- About 80 people from the three Prairie Provinces, British Columbia and Ontario attended this one day workshop in Saskatoon.
- 17 presentations. Presenters represented scientists, managers, academics and graduate students from Environment Canada, University of Manitoba, University of Saskatchewan, University of Regina, University of Guelph, University of Alberta, Agriculture and Agrifood Canada and the Saskatchewan Watershed Authority.

What for?

- The purpose was to promote scientific exchange on aspects of prairie hydrology with various science organizations with an interest in the Prairie region
- The workshop talks were organized around themes of
  - ***Drought and Climate Change*,**
  - ***Distinctive Aspects of Prairie Hydrology* and**
  - ***Prairie Water Availability***
- **Discussions focussed on these themes.**

Drought and Climate Change

- What are the major uncertainties in your understanding that need to be addressed?
- What are the problems in observation systems that would improve your results?
- What are the next steps in predicting drought and climate change hydrology in the Prairies?

Drought and Climate Change

- Areas of uncertainty:
  - meteorological input data,
  - streamflow calibration data,
  - understanding of pothole pond runoff generation,
  - evapotranspiration.
- Problems in observing systems:
  - lack of soil moisture and radiation observations,
  - insufficient snowfall, snowpack and rainfall observations,
  - sparse hydrometric network
  - uneven availability of data that has been collected.
- Next steps in prediction:
  - linking small scale to large scale hydrology in models in order to estimate contributing area,
  - better incorporation of uncertainty in modelling,
  - better data assimilation in models,
  - including landscape change in long term modelling.

Distinctive Aspects of Prairie Hydrology

- What are the known deficiencies in your research that are not related to data?
- How are you dealing with these problems?
- What is holding you back from successfully dealing with these deficiencies?

Distinctive Aspects of Prairie Hydrology

- Known deficiencies in research
  - difficulty in parameterising fill/spill (including initial states),
  - dealing with spatial variability of parameters,
  - necessity of improvements in modelling,
  - unknown spatial applicability of precipitation correction equations.
- Deficiencies were addressed by
  - making assumptions,
  - investigating scales of importance,
  - calibration where necessary.
- Factors holding back progress
  - personal conflicts,
  - scaling issues (particularly for modelling of medium/large basins),
  - difficulty of understanding complex phenomena such as the fill/spill of wetlands at basin scales.

Prairie Water Availability

- Issues of water use and availability from both basin scale studies across the Prairies and Saskatchewan-based studies led by the Saskatchewan Watershed Authority (SWA).
- SWA major study includes
  - Water Use Assessment Project with a pilot project on the Swift Current Creek basin.
  - Groundwater Availability Project will focus on regional aquifer mapping and recharge estimation.
  - Surface Water Availability Project will focus initially on the Souris River basin in respect to hydroclimatic trend analysis, natural flow trend analysis, and water supply availability for major basins.

Conclusions

- Workshop was deemed a success
- Tremendous body of knowledge on prairie drought hydrology has been presented.
- Good progress on cold regions aspects of Prairie hydrology, evapotranspiration and in modelling prairie hydrology.
- Lack of suitable hydrometeorological and soil moisture observations and difficulty in dealing with variable contributing area and wetlands are still presenting challenges.