

# WEST NOSE CREEK WATERSHED RESEARCH NEWS

## August 2006

Groundwater is one of the least understood freshwater resources in Canada, yet demand for groundwater continues to grow as our population expands. There's a pressing need for watersheds dependent on groundwater across the country to understand the local hydrological characteristics of their watersheds, including their aquifers, in order to help develop effective water management plans.

The individuals within the West Nose Creek watershed rely on both groundwater and surface water for their daily needs, yet during periods of surface water decline, such as in times of drought, groundwater resources become more important, and the pressures on this resource increase.

We have the unique opportunity to collaborate with you, the landowners in the West Nose Creek watershed, in order to advance our understanding of groundwater in the area. This information, in combination with surface water and climate data, can help us to answer some of the following important questions:

- *How much water is there and where is it stored?*
- *How much of it can we access?*
- *How is the water replenished and how often?*
- *How do water levels respond to pumping or changes in weather or climate?*
- *How do surface water and groundwater resources interact with one another?*
- *What are the long-term trends in groundwater response to changes in climate?*

The ultimate goal of our research in the West Nose Creek watershed is to set a standard for watershed monitoring, modeling and management in Alberta.

We truly appreciate your continued support in working towards this goal.

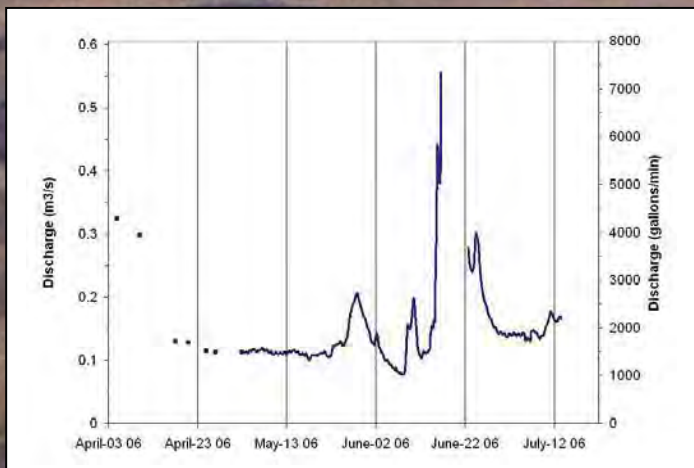


# LISA'S UPDATE



Hello! Since I haven't had a chance to catch up with you personally, here are some updates on my latest progress. This spring I finished my thesis report and started back working at WorleyParsons Komex, an environmental consulting company in Calgary. In May, I presented my project to a public audience and passed a defence examination at the University. I also presented my project in Edmonton at a conference for the Canadian Water Resources Association and at Alberta Environment. While presenting my work on establishing the water monitoring network for the West Nose Creek Watershed, I encountered many members of the community, academics, and members of government who were interested and inspired by this type of initiative. The experience was extremely rewarding and I want to thank all of you for your interest and cooperation in this project.

## STREAM DISCHARGE



The graph to the left shows the discharge at our gauging station in West Nose Creek from April to mid July of this year.

The Peak flow occurred around June 16.

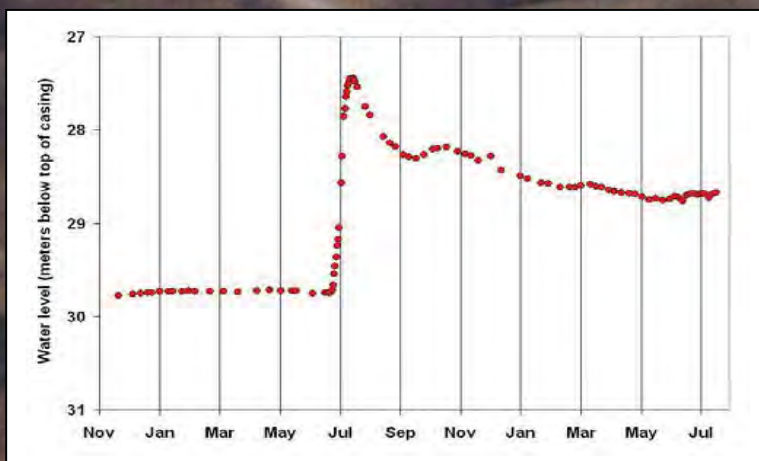


Gauging West Nose Creek on June 16, 2006

## WELL WATER LEVELS

The graph to the right includes the updated data for the same well we presented in the previous newsletter.

Although the water levels have come down since last year's recharge, they have not yet dropped to last year's base levels.



The results from Lisa's study have been so positive that we plan to continue monitoring the network of private wells that she established. Collecting the data over a longer term will give us more insight into the nature of the aquifer system and the long term patterns of water levels as they respond to changes in climate and weather.



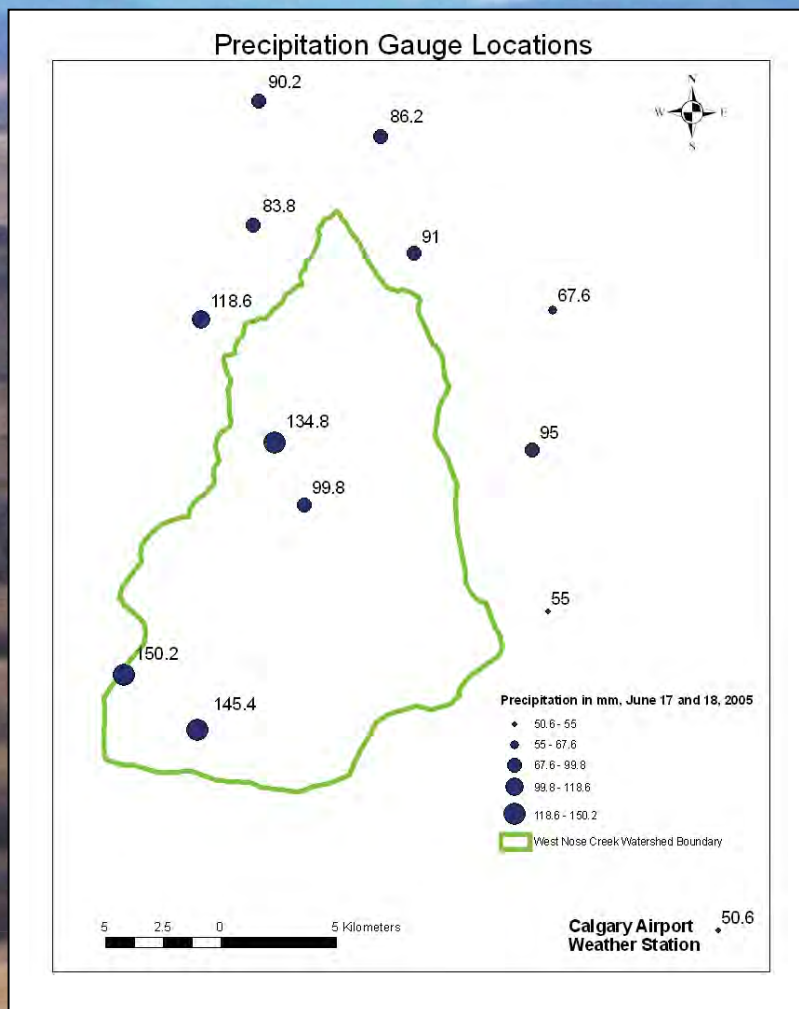
# PRECIPITATION IN THE WATERSHED

A group in Geography, under the supervision of Dr. Shawn Marshall, have been studying precipitation and storm systems in the foothills regions. They have four rain gauges set up in the West Nose Creek watershed, as well as eight others in close proximity to the watershed, and have kindly shared their data with us. We'd like to use their data to show you some of the spatial variation of precipitation in and around the watershed.

## THE STORM EVENT OF JUNE 17, 2005

The map to the right shows the spatial variation of precipitation during the storm event of June 17, 2005. The precipitation gauges are in blue, and the amount of precipitation (in millimeters) June 17 and 18 (2005) is labeled beside each gauge.

Environment Canada's weather station at the Calgary International Airport is shown in the bottom right hand corner of the map. It recorded 50.6 mm of total precipitation during the storm event. However, the average precipitation measured by the 13 rain gauges in and around the West Nose Creek Watershed was 97.9 mm. In addition, the variability between the gauges in and near the watershed was substantial, with individual gauges measuring precipitation values ranging from 55 mm to 150.2 mm.



## SPRINGS RESEARCH



Nathan Green, an honours geology student, is beginning a project aimed at characterizing the hydrogeology of the springs in the West Nose Creek Watershed. One interesting outcome of Lisa's research was that the groundwater basin of the West Nose Creek watershed potentially extends further west than the surface water divide. Studying the springs in the area will give us a better indication of the extent of the groundwater basin, and its contribution to the volume of West Nose Creek. Nathan's research will aim to define the role of the springs in the interaction between groundwater and surface water and the influence of topography on the springs.



# PROFILES

## Dr. Masaki Hayashi



Masaki in our soil pit at Spy Hill farm!

Masaki was born and grew up in a rural community in Japan. After finishing a geology degree at a university in Tokyo, he went to Zambia in southern Africa and spent a year as a volunteer working in a refugee camp to improve the condition of groundwater wells in the camp. This experience got him interested in groundwater, and he went back to school to complete a master's degree in hydrogeology in Japan, and a doctoral degree at the University of Waterloo in Ontario. He came to the University of Calgary as an Assistant Professor in 1997, and he is now an Associate Professor in the Department of Geology and Geophysics. In 2002, he started a hydrological study of the West Nose Creek watershed in order to advance our scientific knowledge necessary for answering an important question: "How can we use groundwater and surface water sustainably in Alberta?" Among many aspects of hydrology, he is particularly interested in how groundwater is replenished by snow and rain, how it is stored in rocks and soils, and how it is connected to creeks and wetlands.

## Karen Miller

Karen has recently begun work at the University of Calgary as a research technician, and will be primarily involved in the West Nose Creek Watershed project. She was born in Calgary, grew up in Ottawa, and has recently graduated from the University of British Columbia in Vancouver with a BSc in Environmental Science specializing in water and atmosphere. She is very interested in agricultural research; her undergraduate thesis focused on an analysis of the environmental impacts of greenhouse development in the Agricultural Land Reserve (ALR) in Delta, British Columbia. She looks forward to meeting you within the coming months!



Karen

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Please feel free to contact us if you have any questions.  
We look forward to meeting with you again in the fall!

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