WISKI - ESRD's Data Management System

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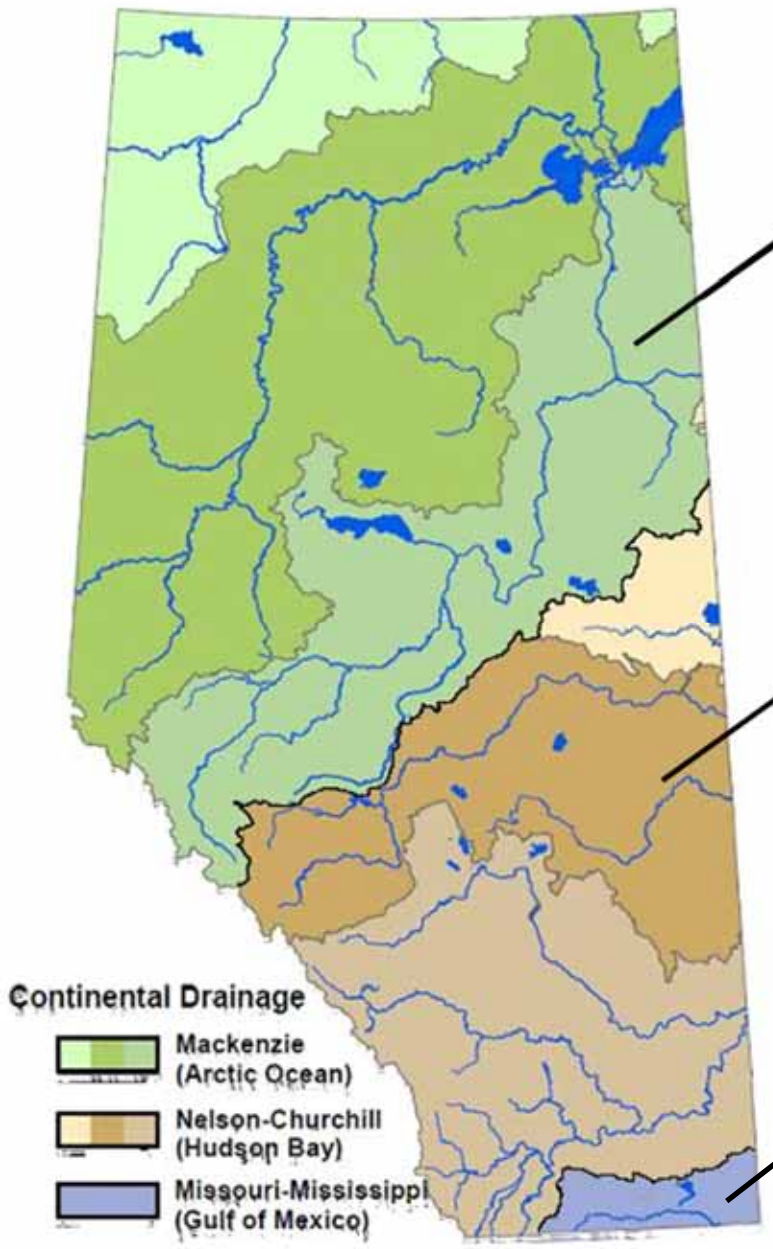


North to Artic Ocean

Via Mackenzie River

Drainage Area 163,599 mi^2

Annual Flow 92,070,388 acre-feet

East to Hudson Bay via

Churchill and Nelson Rivers

Drainage Area 87,782 mi^2

Annual Flow 14,130,501 acre-feet

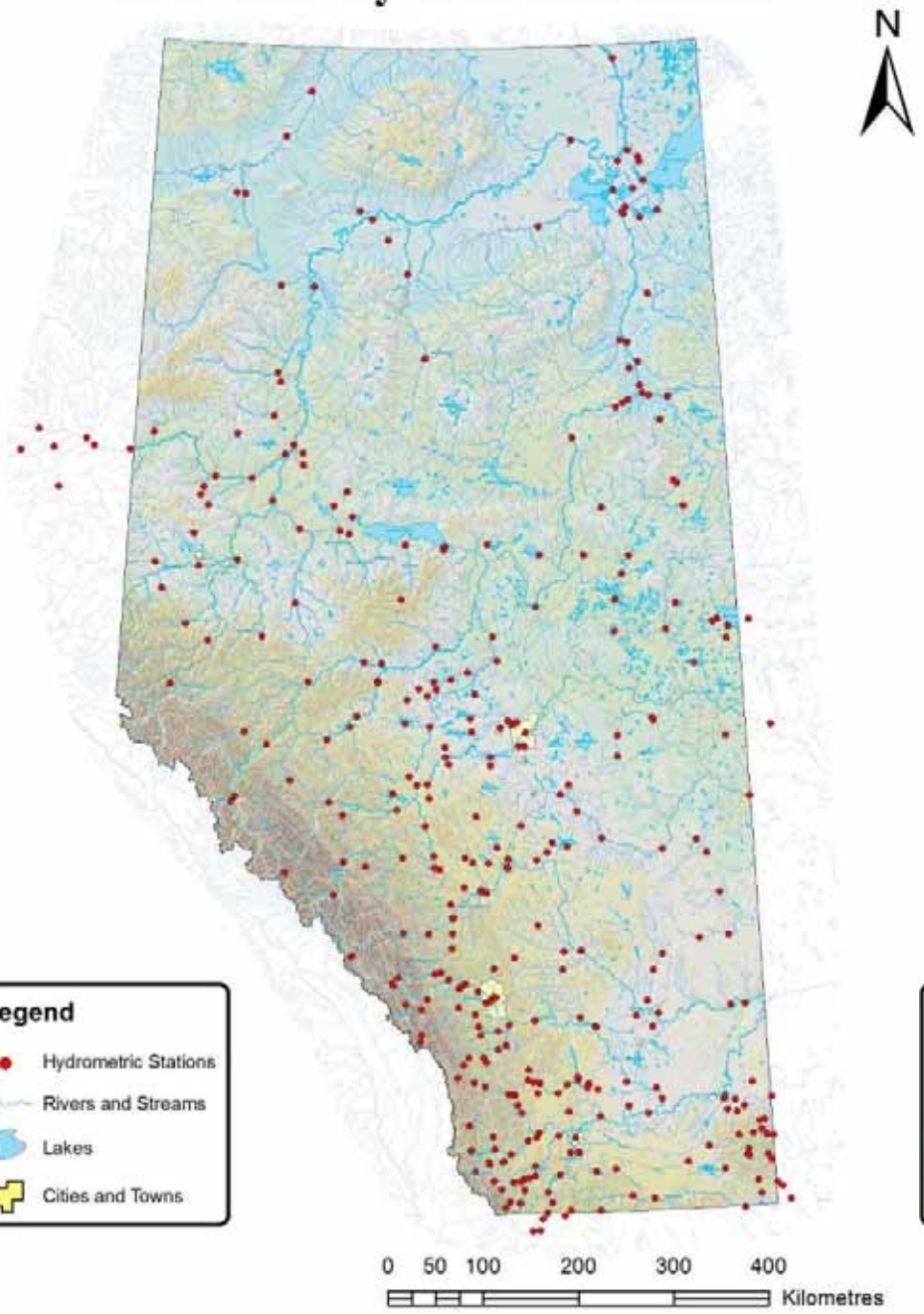
South to Gulf Of Mexico

Via Missouri River

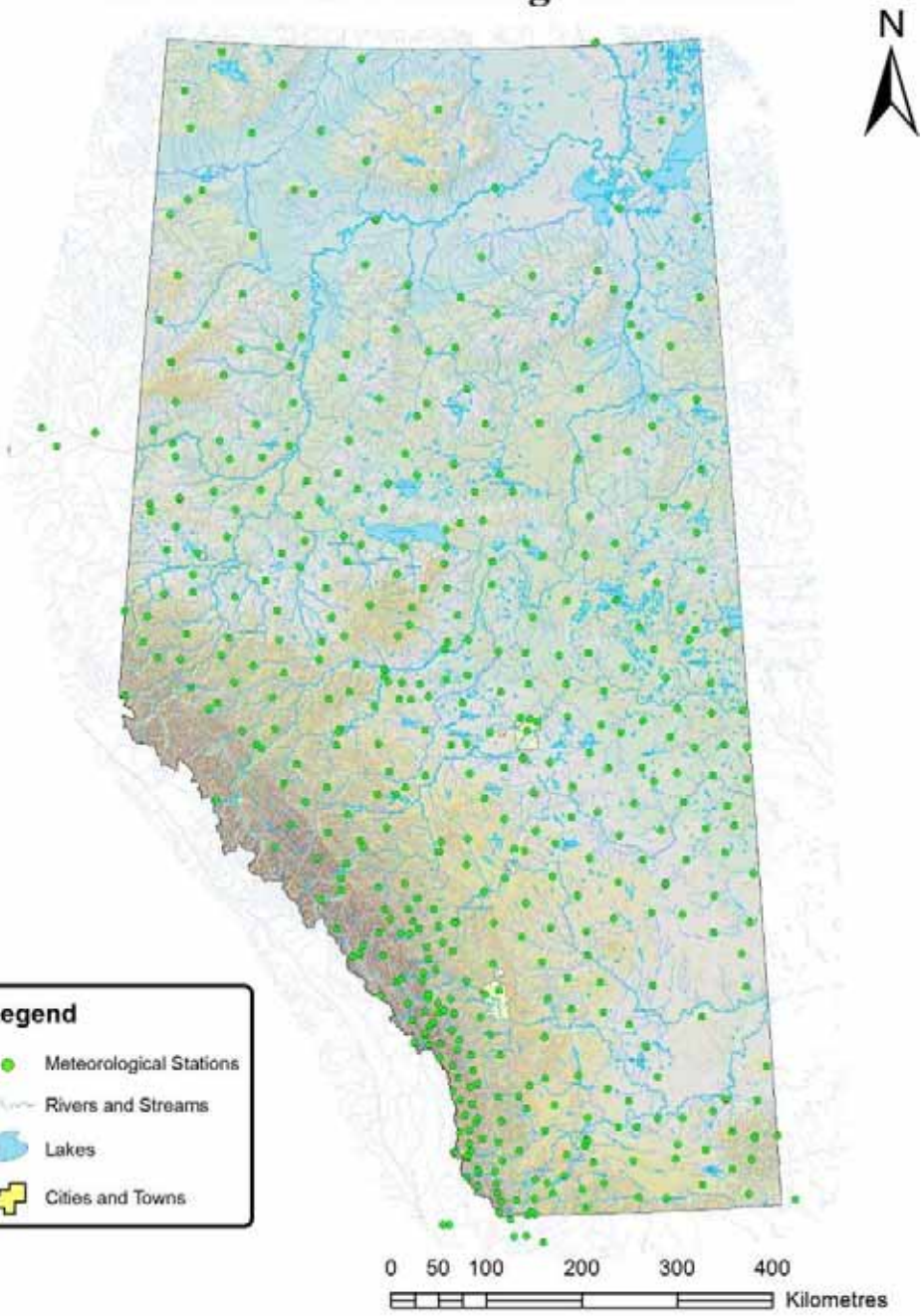
Drainage Area 4,588 mi^2

Annual Flow 129,715 acre-feet

Real-Time Hydrometric Stations



Real-Time Meteorological Stations



What is WISKI?

WISKI

Water
Information
System
Kisters
Inc.

- WISKI is a Enterprise Data Management application and database housing time series data and metadata

- Kisters is the company in Germany that built WISKI application

WISKI and ESRD: Background

- Before WISKI:
  - Two databases in use: Newleaf and Time Studio Manager (TSM)
  - New Leaf for NRT database
  - Time Studio for storing historical data and operating flow models
- Why WISKI?
  - Time Studio purchased by Kisters and would not be supported after certain time
  - Purchasing WISKI ensured support for Time Studio database transfer
  - WISKI allowed transfer of Time Studio modeling capabilities
  - WISKI supports publishing data through a Web client

WISKI Implementation

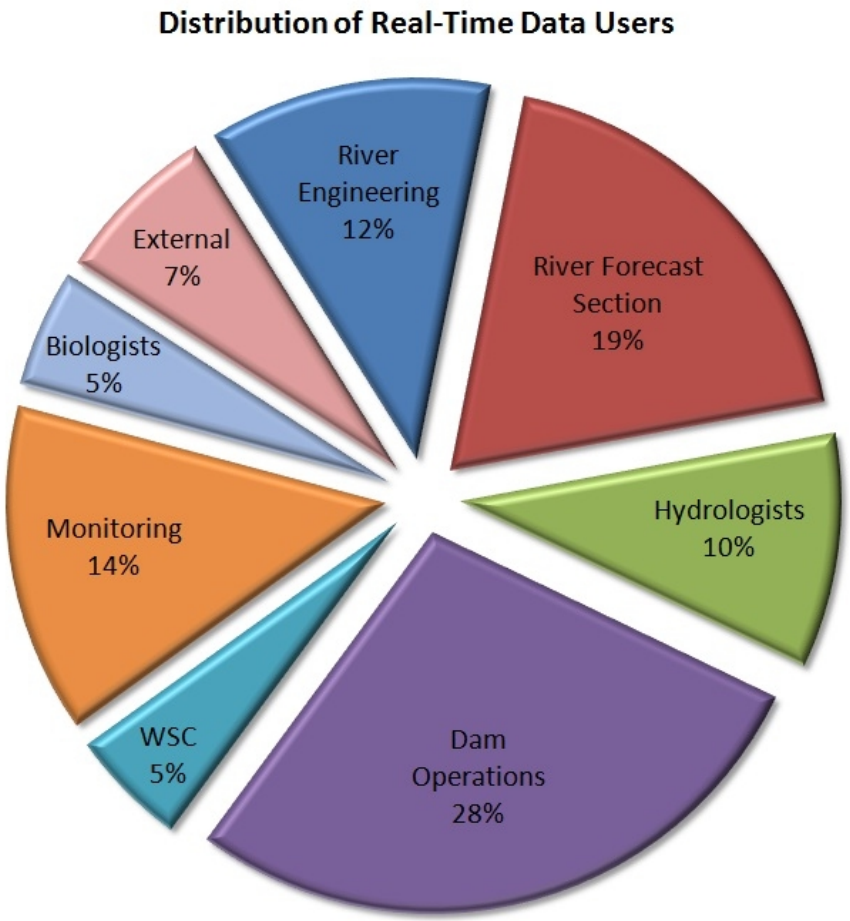
- Consultants started working on WISKI project in December 2007
- WISKI is currently in operational status since January 2012
- Both Newleaf and TSM were still storing data up till 2012
- WISKI will continue to grow and improve to meet user requirements

WISKI Data within ESRD

- WISKI entered into operations January 2012
- Data in WISKI:
  - ~450 Hydrometric Stations
  - ~500 Meteorological Stations
  - ~200 Groundwater Stations
- Data acquisition from multiple data owners:
  - ESRD
  - Transalta Utilities
  - Alberta Agriculture and Rural Development
  - Water Survey Canada
  - BC Hydro
  - USGS
  - USBR

WISKI: ESRD Enterprise System

- WISKI serves many users & functions within ESRD
- Primary Users:
  - River Forecast & Engineering
  - Dam Operations
- WISKI allows
- Functions:
  - Modeling
  - Graphing
  - Export & Analysis
  - NRT & Archival
  - Continuing to expand…
- User permission is managed to control *who* can access & edit data

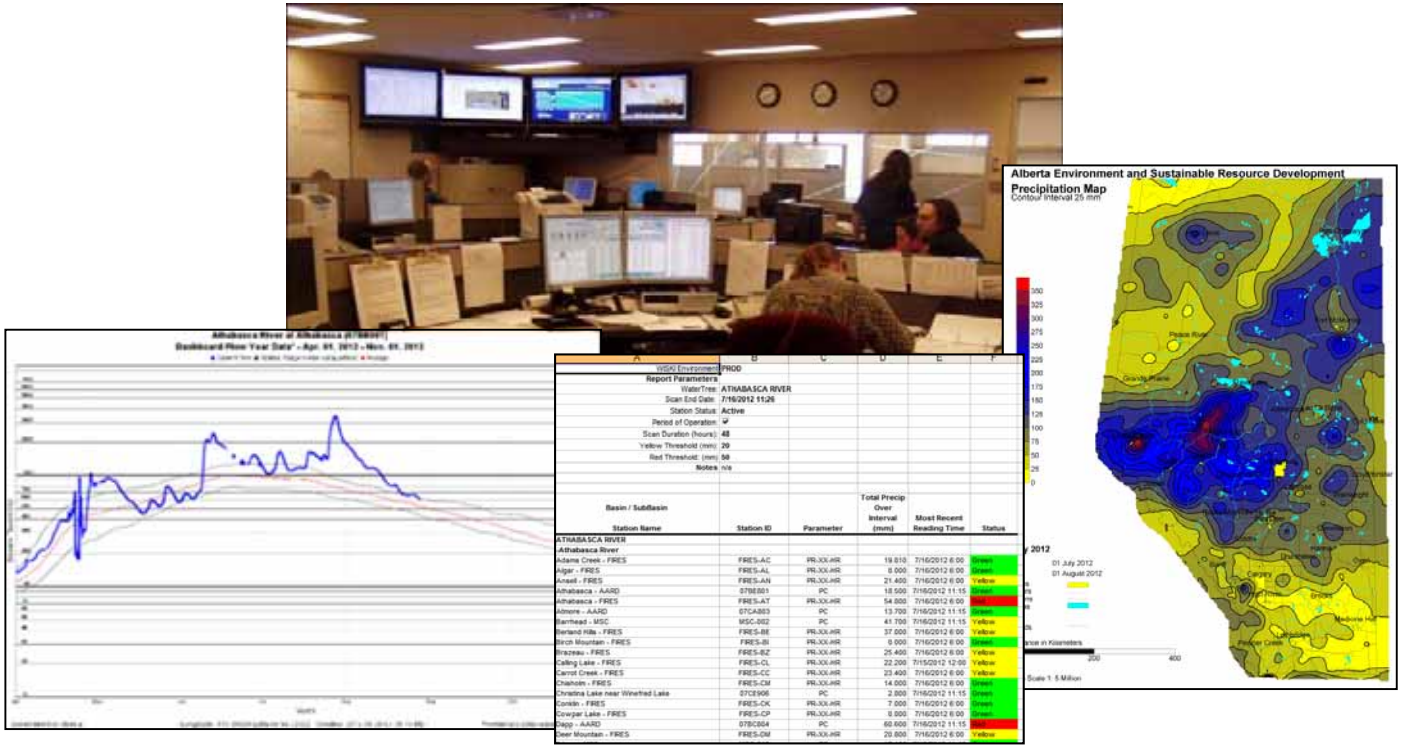


WISKI Use

- Public-facing Alberta's River Basins website: http://www.environment.alberta.ca/apps/basins/default.aspx

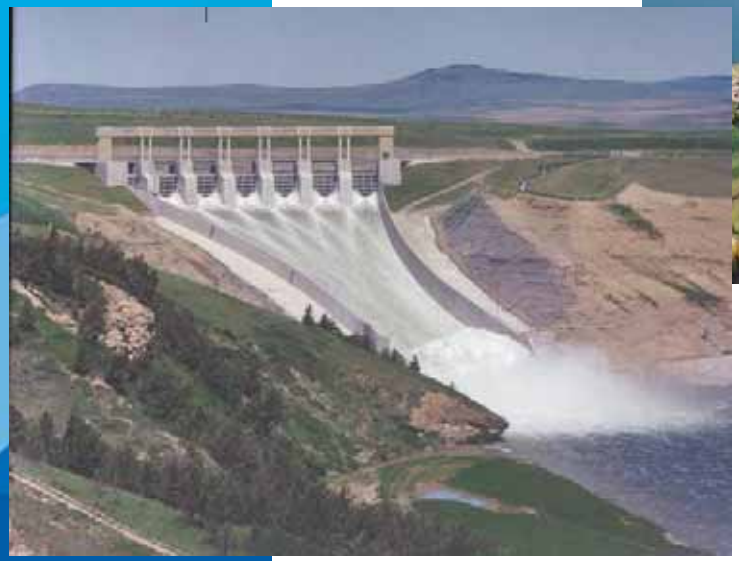
WISKI Data Use within ESRD

- River Forecast Centre
  - data QA and corrections, daily natural flows, monthly water supply, open water flow forecasts, ice freeze-up and break-up forecasts, situation awareness through review of all NRT hydro and met data



WISKI Data Use within ESRD

- Operators of provincially owned infrastructure (e.g. dams)
  - Management of storage to meet water licence and apportionment requirements
  - Flood Operating Procedures



WISKI Data Use within ESRD

- Hydrologists
  - water availability for planning and license approvals, basin modeling, frequency analysis, Disaster Recovery Program data assessments, EIA review, computation of NRT water conservation flows,
  - Water quality data (WT, DO)
- Hydrogeologists (Groundwater specialists)
  - Groundwater modeling
  - Groundwater data

Water Supply Outlook for Alberta
August 2012

Water Supply Forecast as of August 1, 2012 - Oldman River Basin (Natural

Locations	Volume Forecast for March 1 to September 30, 2012				
	Volume in dam³	Volume as a % of Average	Probable Range as a % of Average	Potential Minimum as % of Average	
St. Mary River	832,000*	110	108-113	105	
Belly River	281,000	115	113-117	109	
Waterton River	554,000	91	89-95	88	
Oldman River near Brocket	1,190,000	109	108-110	106	
Oldman River at Lethbridge	3,154,000	105	104-109	102	

* - This value is the natural volume and includes the U.S. share

Average is calculated for the March 1 to September 30 period from 1912 to 2

NOTE: There is a 50% chance that the actual natural flow will fall within the
given; a 25% chance that the actual flow will be less than the lower bound o
range given; and a 10% chance that the actual natural flow will be less than

WISKI specifics

- KISTERS software in use at ESRD:
  - WSP, WISKI7, WISKI Modeling, SKED, BIBER, Alarm Manager
- Some specific uses of WISKI at ESRD:
  - Alarm Manager – flood thresholds, ice movement alarms, and aquatic ecosystem health thresholds
  - Dashboard plots and KiScript reports written in-house
  - Data QA/QC (i.e., changing data in near real-time)
  - Input masks for entry of field visits and flow measurements
  - Writing model results to WISKI to calculate water levels
  - Automated data exports to stakeholders using Java API

Future Direction

- Further integration of WISKI GIS functionality
  - River Forecast Centre ‘dashboard’
  - Precipitation mapping
  - Flood ‘wave’ mapping
- Enhanced data acquisitions
  - Rocky Mountain Hydrological Observatory Project
  - Logger Data
  - Snow Course Data
  - Metadata: Benchmarks, station reports, cross sections
- Enhanced website interface with WISKI
  - WISKI Web Pro: to expand ESRD’s WISKI user base
  - WISKI Web Public: to replace the current website

Questions

Courtesy of BC Hydro