

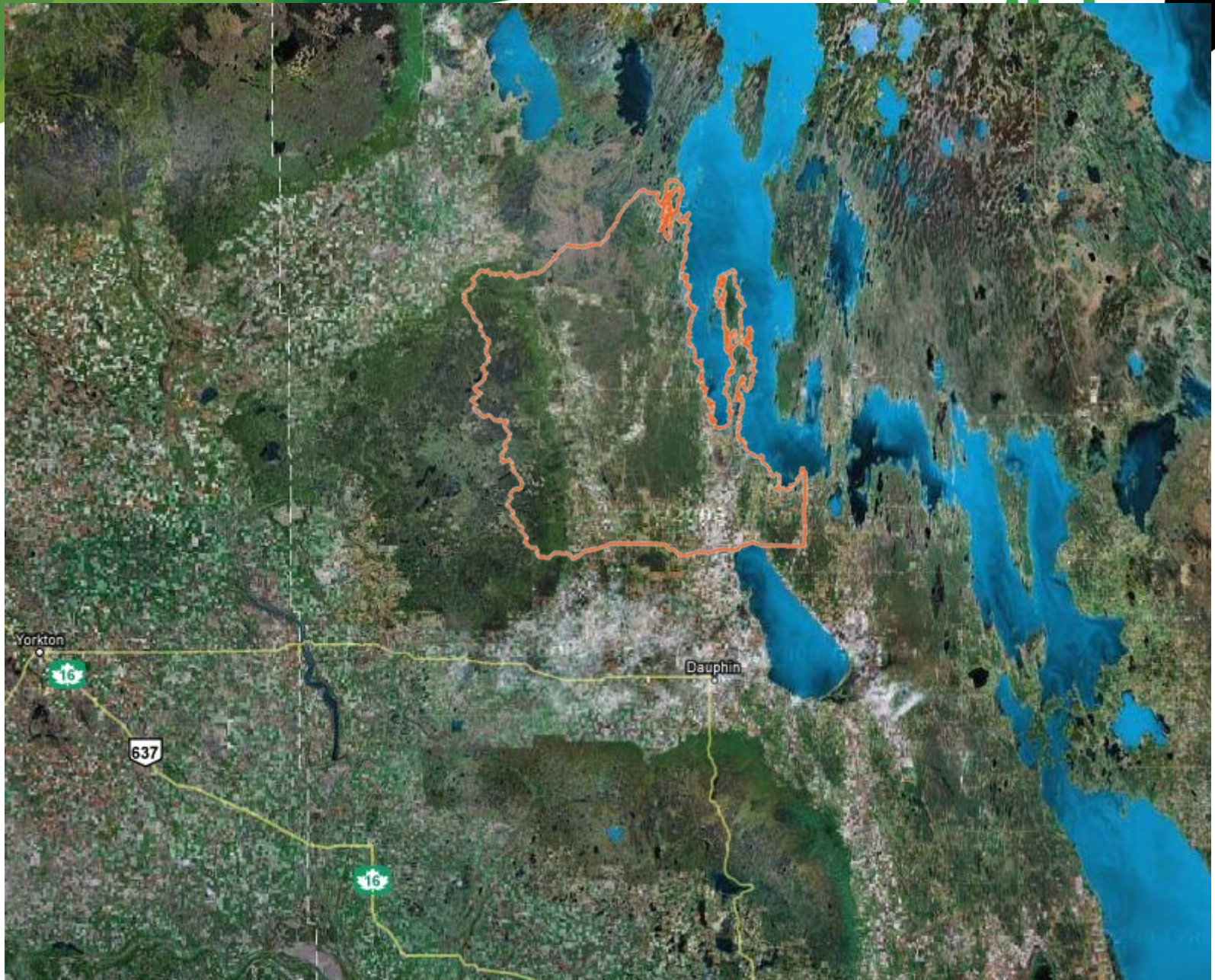
# Hydrology Input for East Duck Mountain IWMP

prepared by

Manitoba Water Stewardship

# Outline

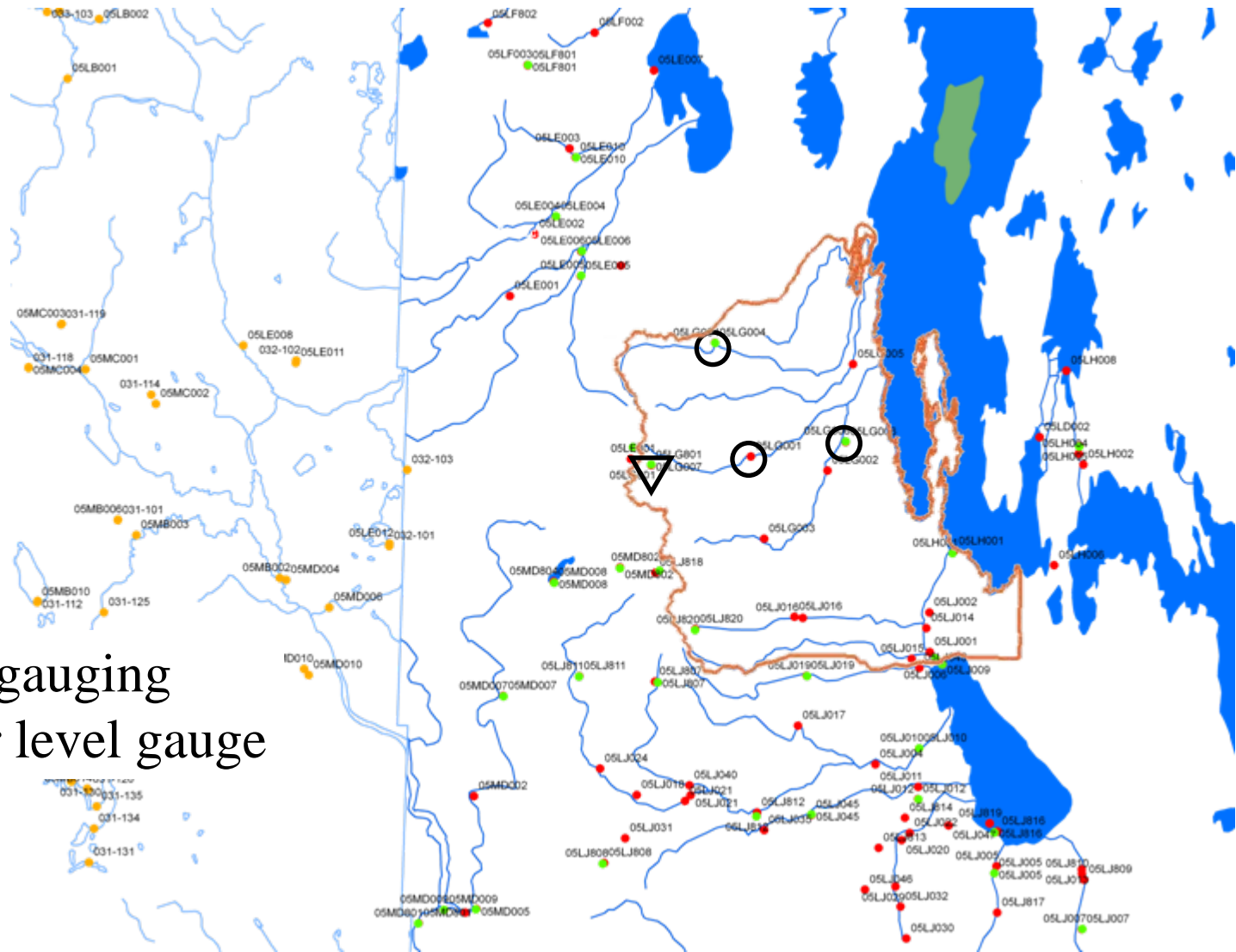
- Overall view of:
  - drainage area
  - gauging stations
  - meteorological stations
- Runoff from selected rivers
  - annual volumes
  - monthly distributions
- Climate
  - precipitation
  - air temperature
- Flood flows



Source: Google Maps



# Gauging stations in East Duck catchment

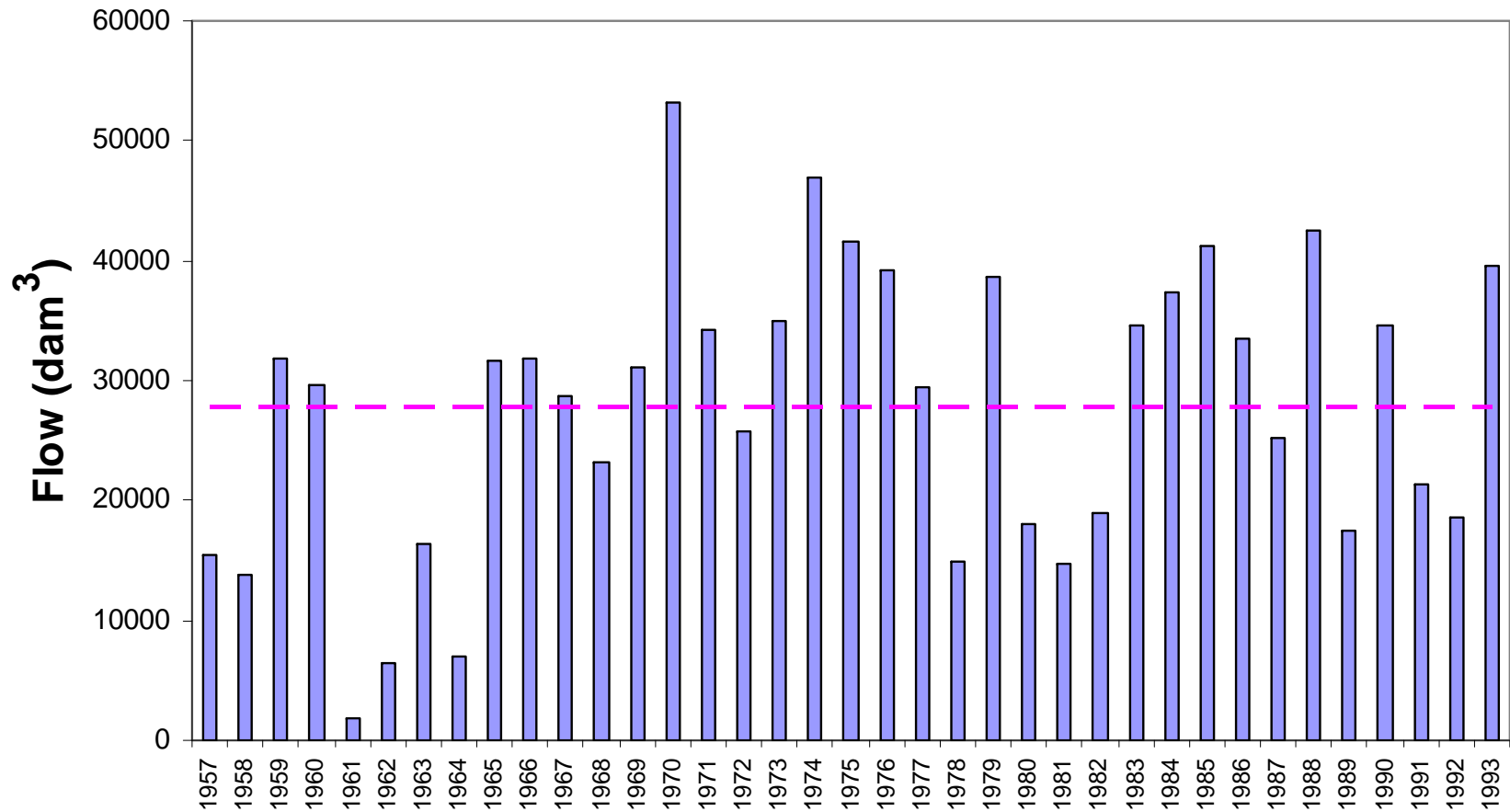


- Flow gauging
- ▽ Water level gauge

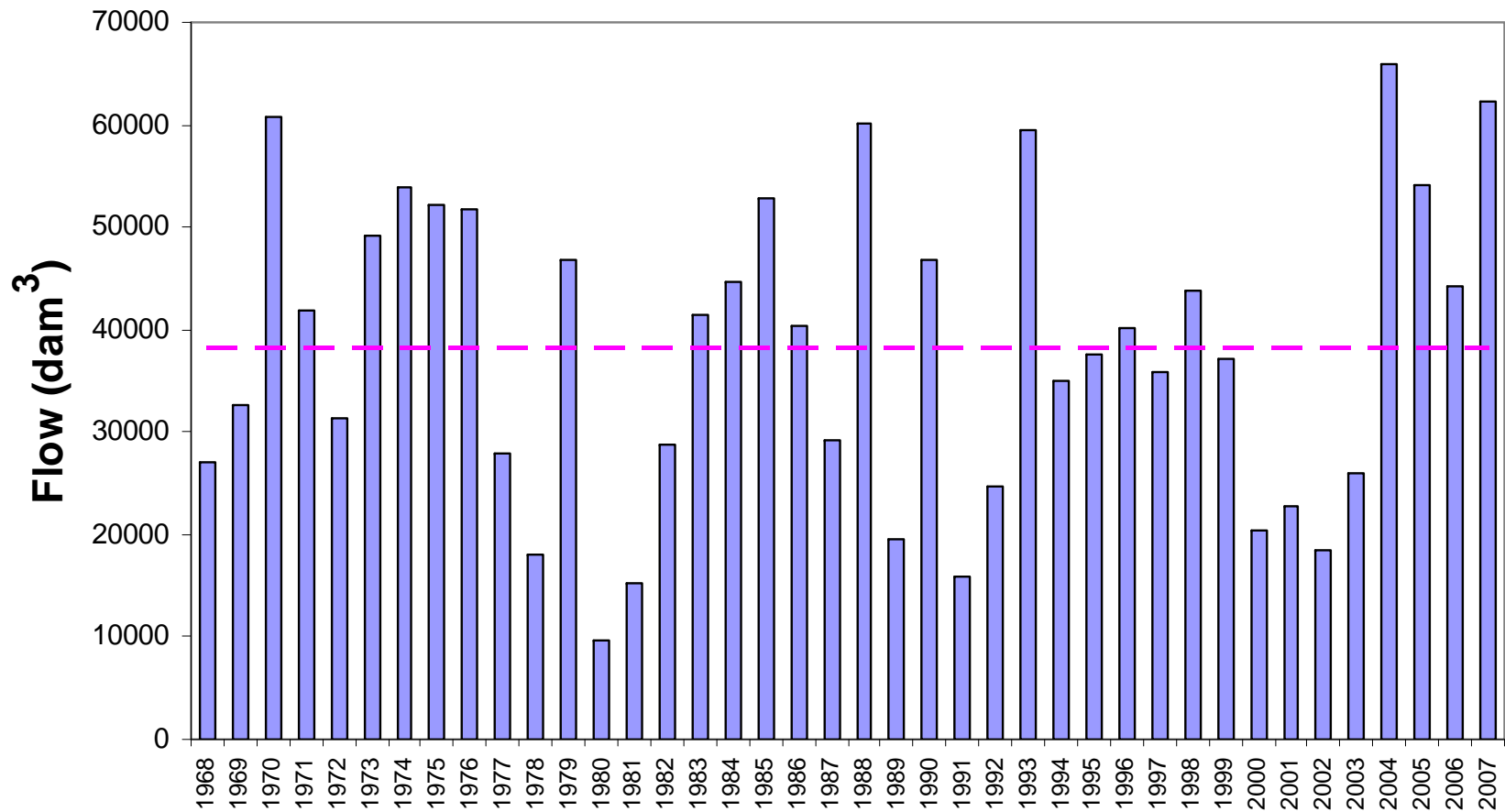
# Summary of investigated stations

Measurement	Station #	Station name	Series
Flow	05LG001	North Pine River near Pine River	1957 - 1993
	05LG004	North Duck River at Cowan	1968 - 2007
	05LG006	Garland River near Duck River	1967 - 1993
Water level	05LG801	Beaver Lake near Pine River	1959 - 2008

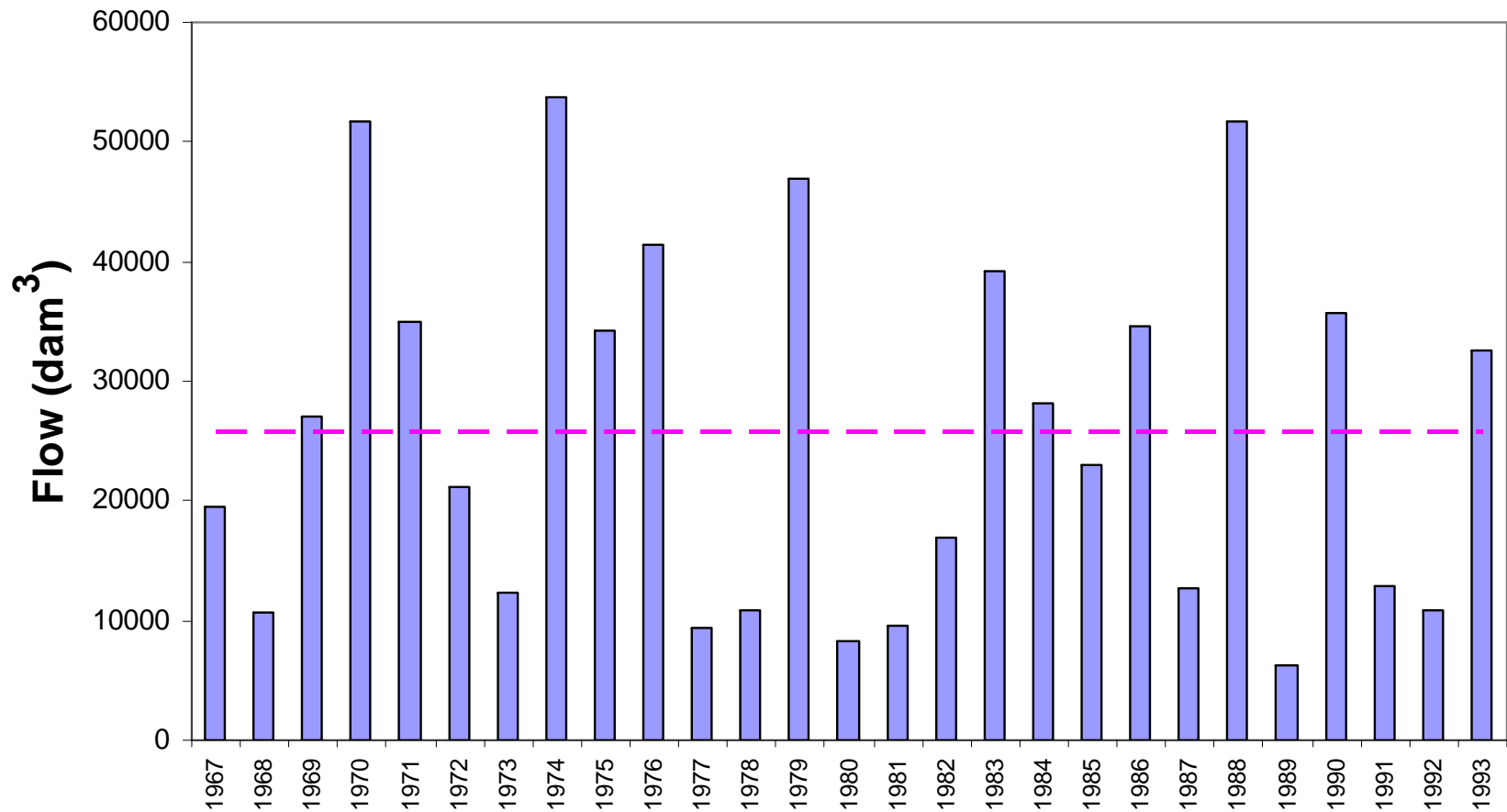
# Annual flow volumes of North Pine River near Pine River



# Annual flow volumes of North Duck River at Cowan

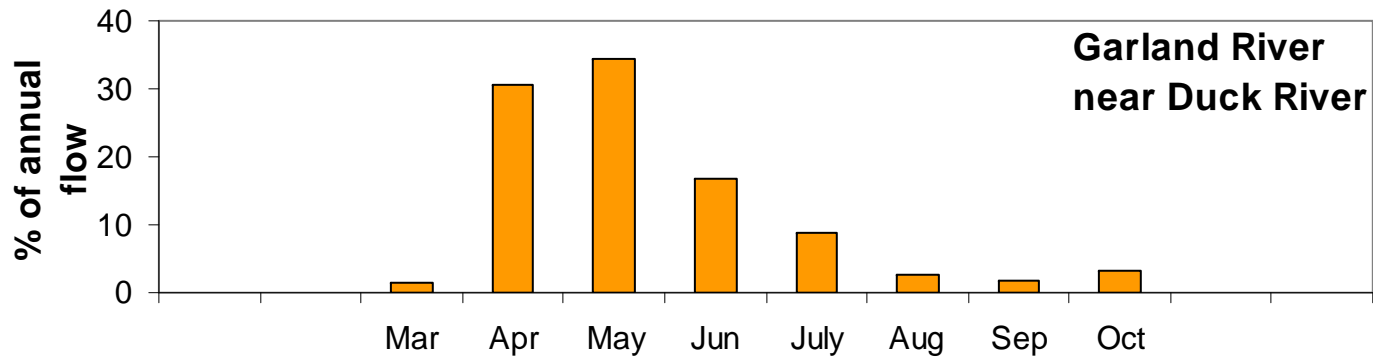
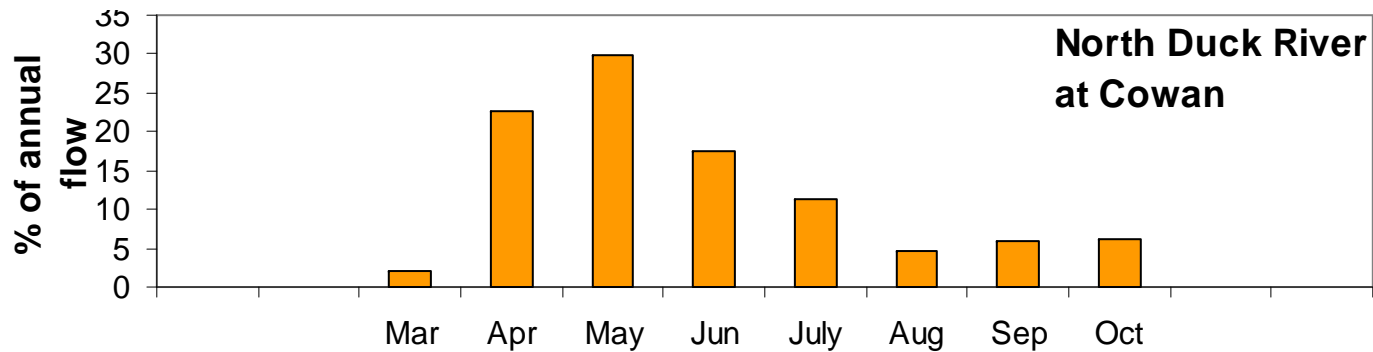
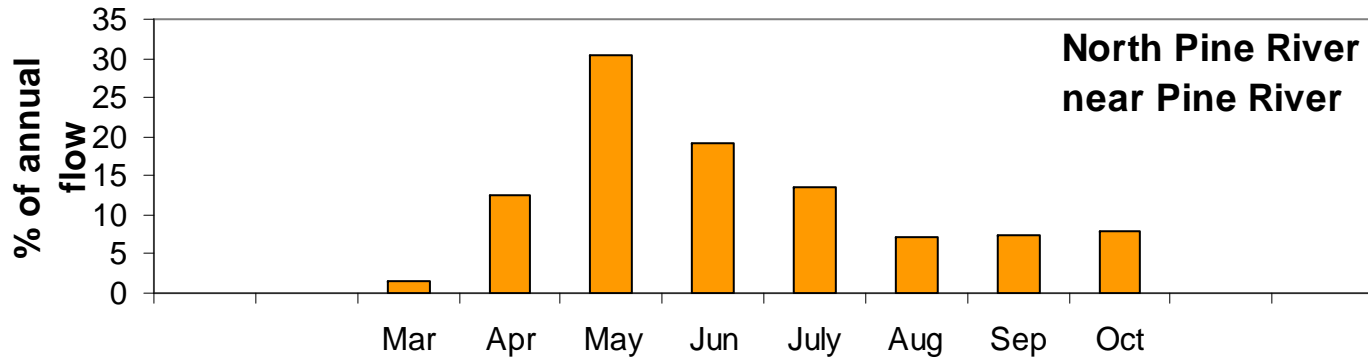


# Annual flow volumes of Garland River near Duck River

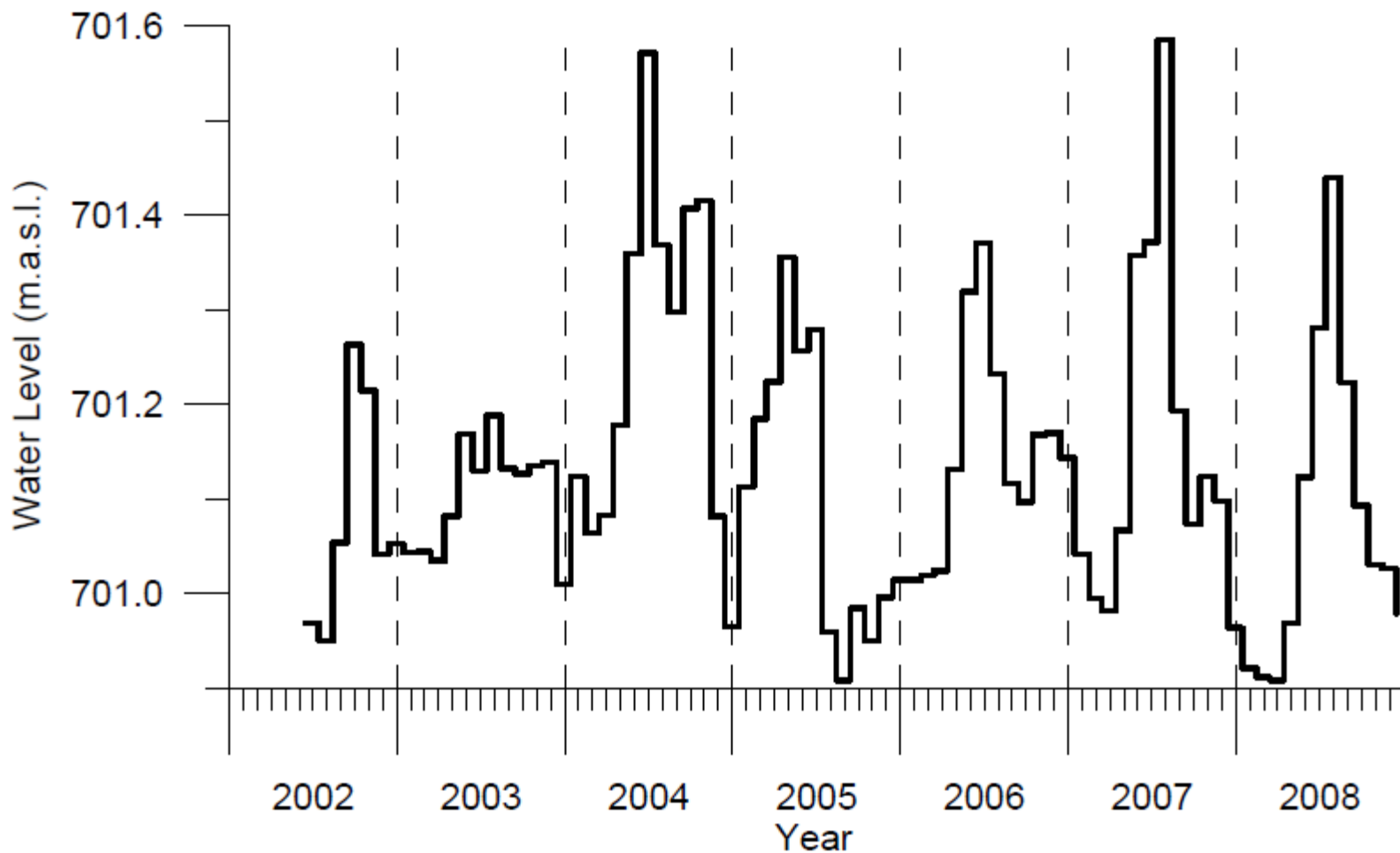




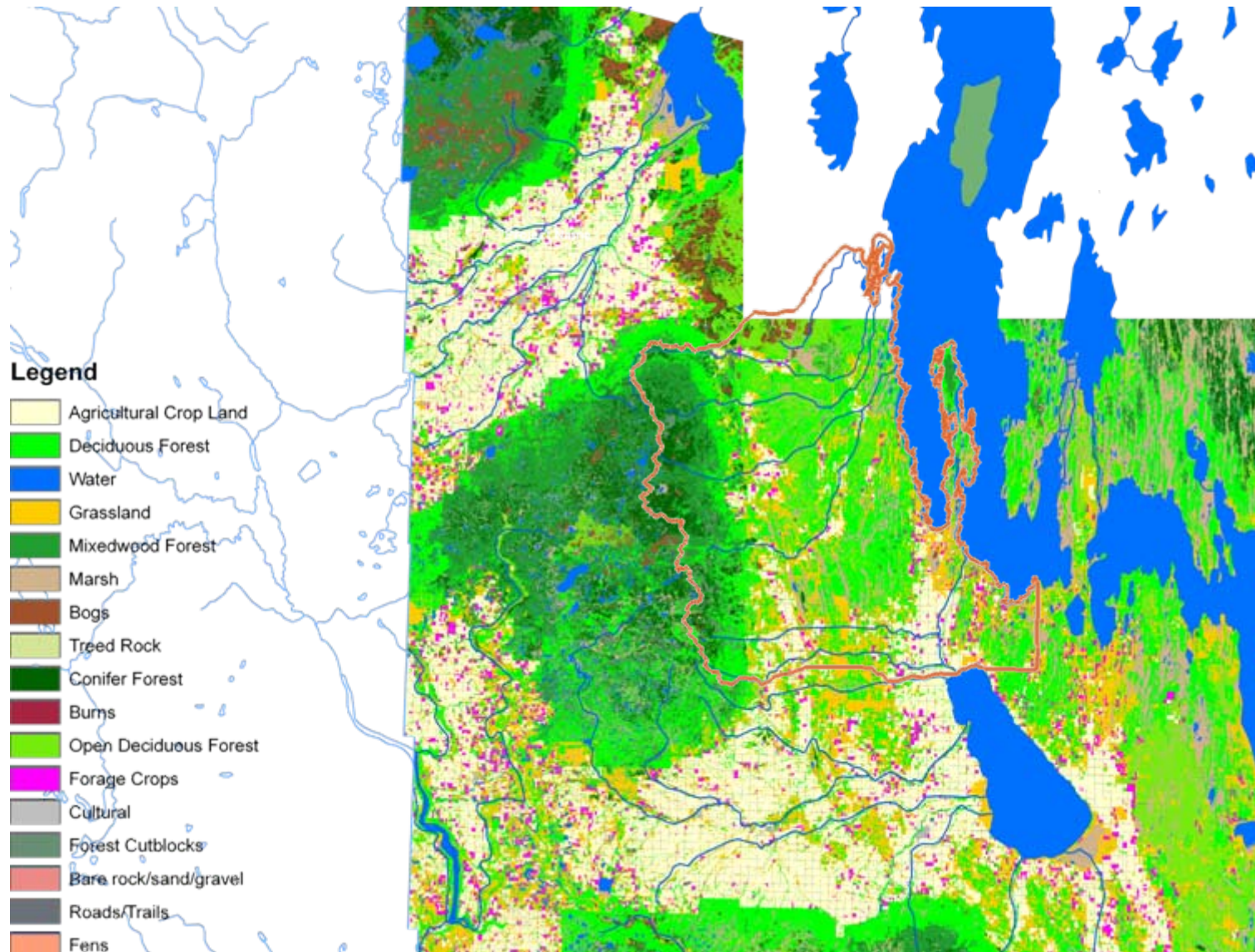
# Monthly distributions



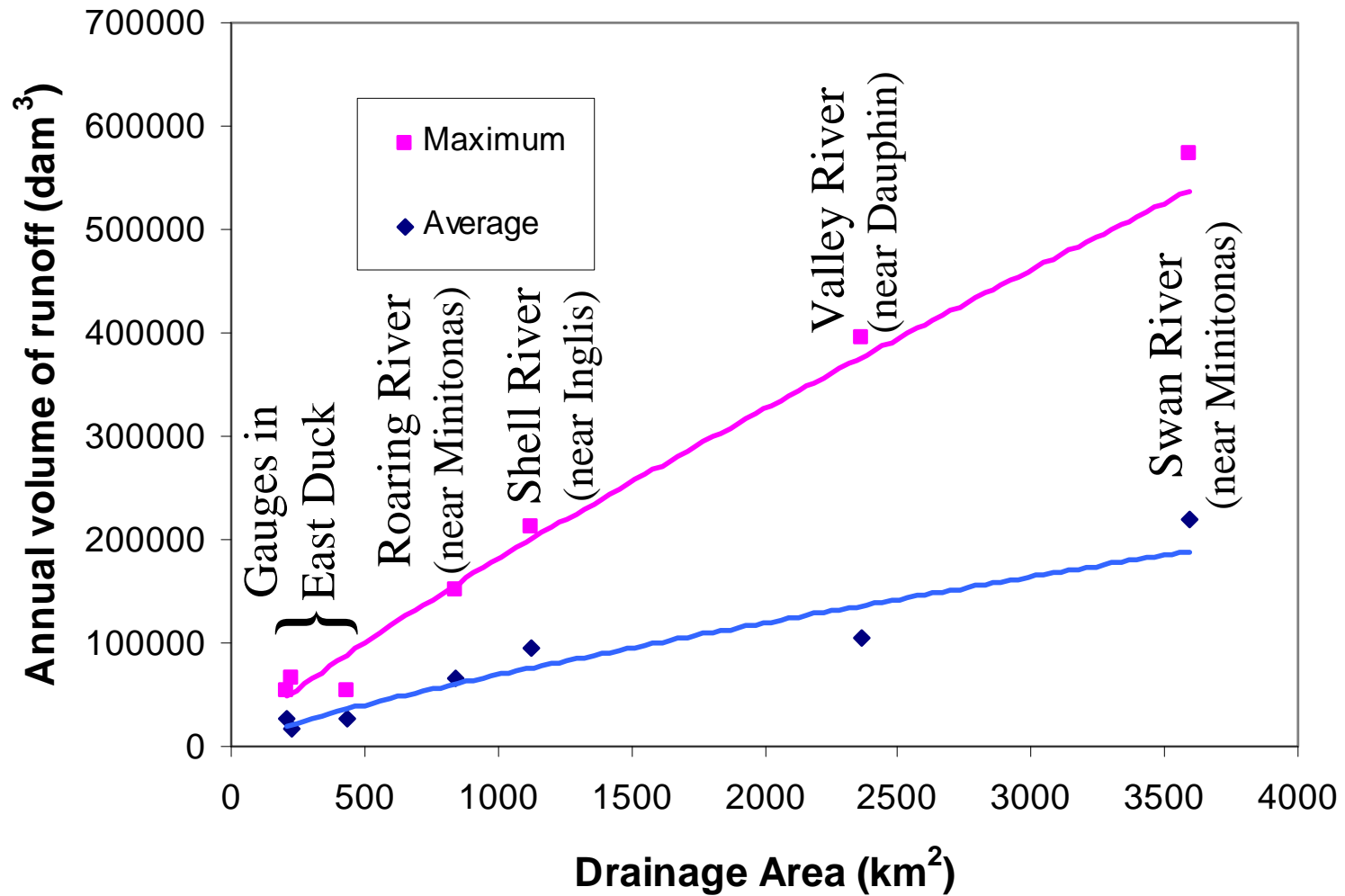
# Mean monthly water levels in Beaver Lake



# Land usage in East Duck catchment



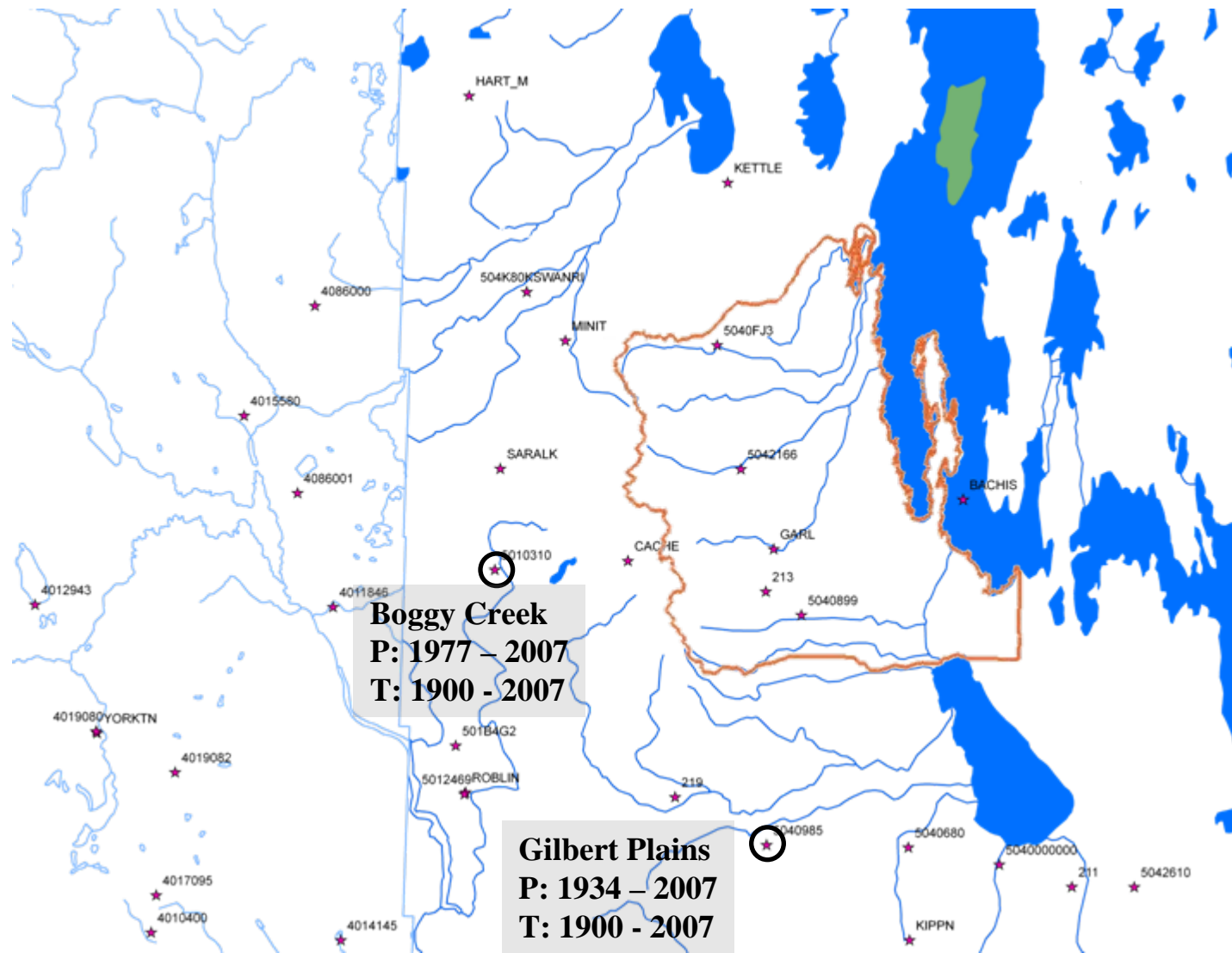
# Regionalisation



# Summary of investigated stations

Catchment	Station #	Station name	Drainage area (km <sup>2</sup> )	Average annual discharge (dam <sup>3</sup> )	Maximum annual discharge (dam <sup>3</sup> )	High volume years
Swan Lake	05LE005	Roaring River near Minitonas	838	65,438	150,465	1988
	05LE006	Swan River near Minitonas	3,590	218,614	573,923	1995, 1988, 2006
East Duck	05LG001	North Pine River near Pine River	210	27,723	53,255	
	05LG004	North Duck River at Cowan	223	18,142	65,835	2004, 2006
	05LG006	Garland River near Duck River	434	25,809	53,770	
Shell-mouth	05MD005	Shell River near Inglis	1,130	95,484	211,678	1995
Dauphin Lake	05LJ010	Valley River near Dauphin	2,360	103,683	395,048	1995

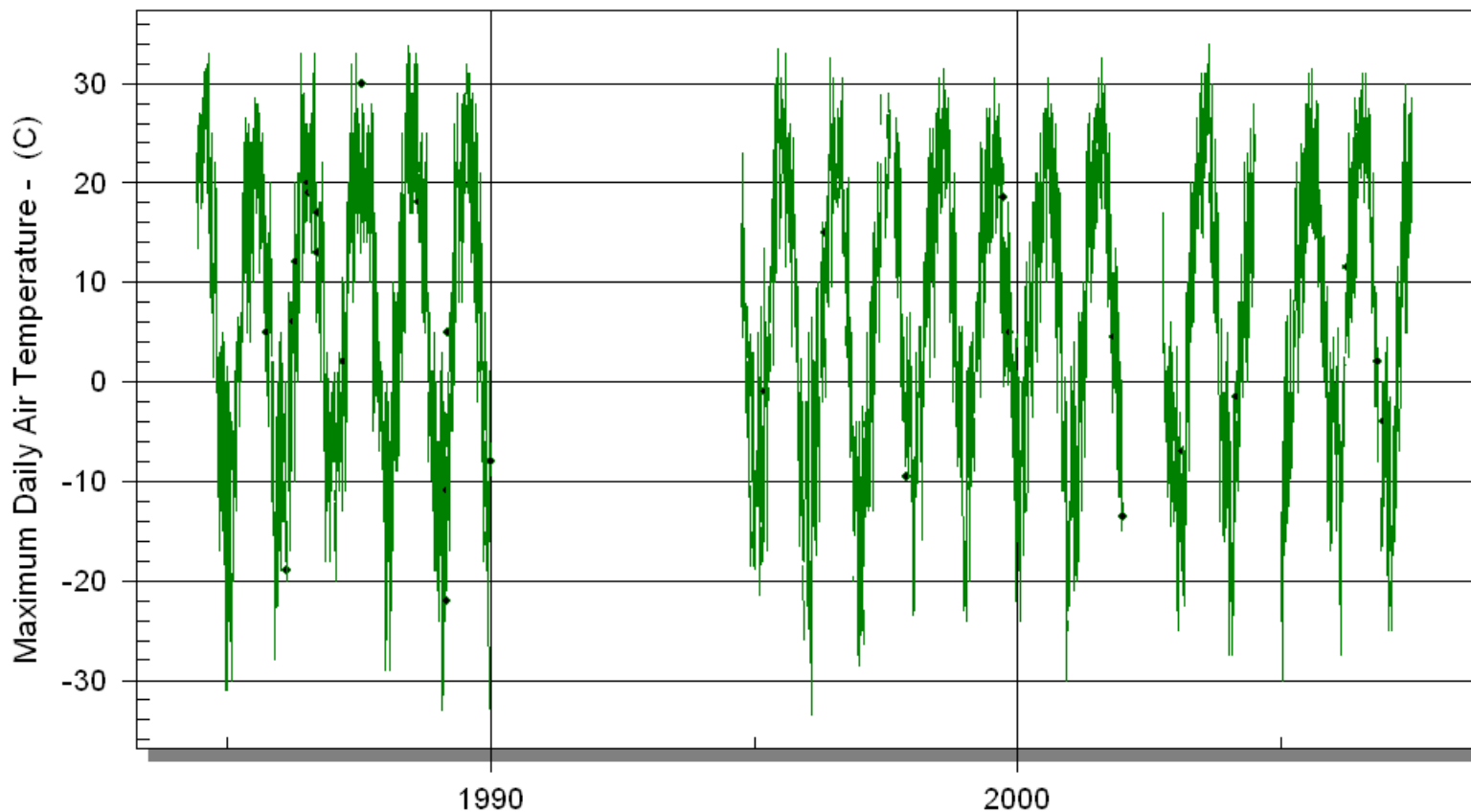
# Climate stations





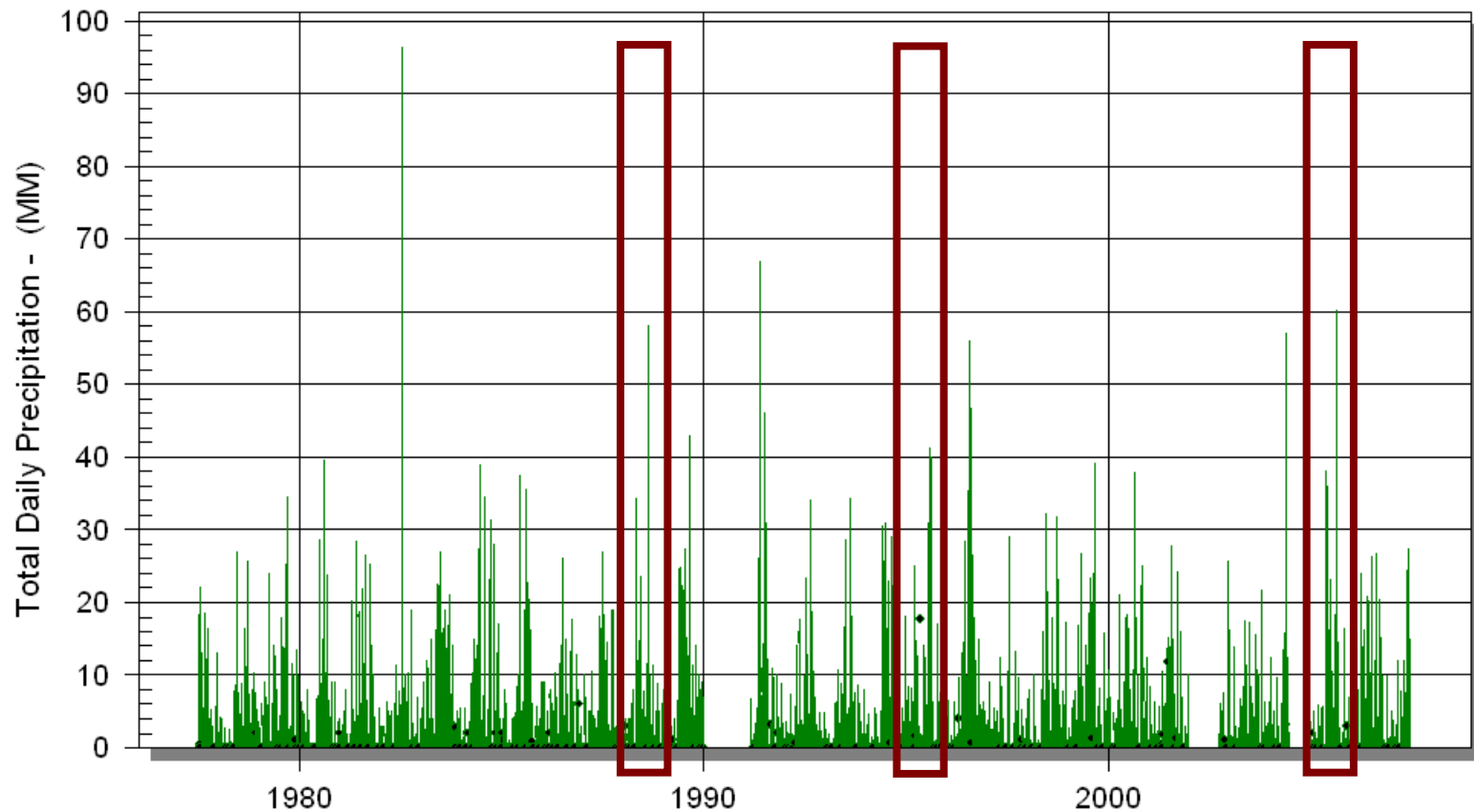
# Air Temperature at Boggy Creek

BOGGY CREEK  
ATMOSPHERIC ENVIRONMENT SERVICES DATA

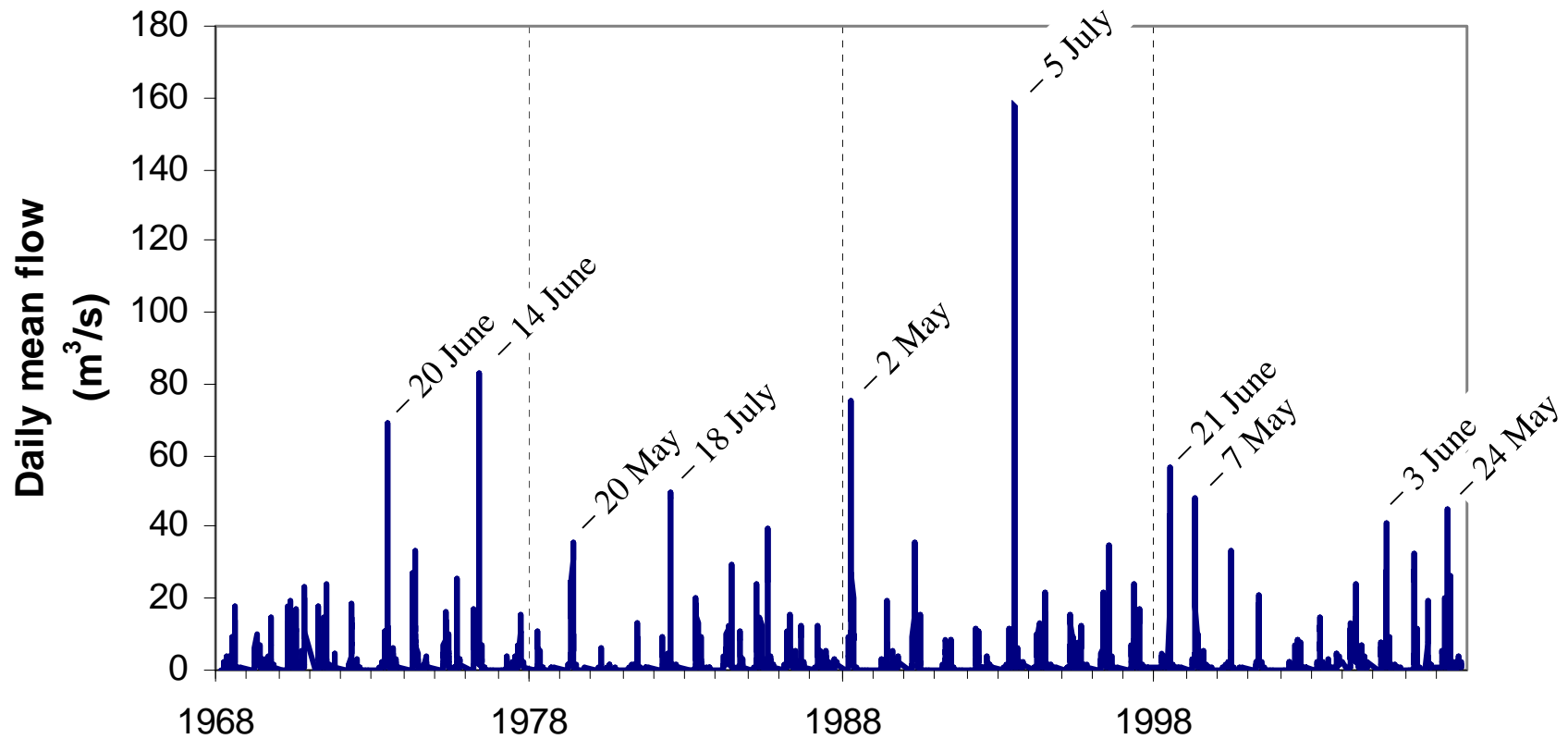


# Precipitation at Boggy Creek

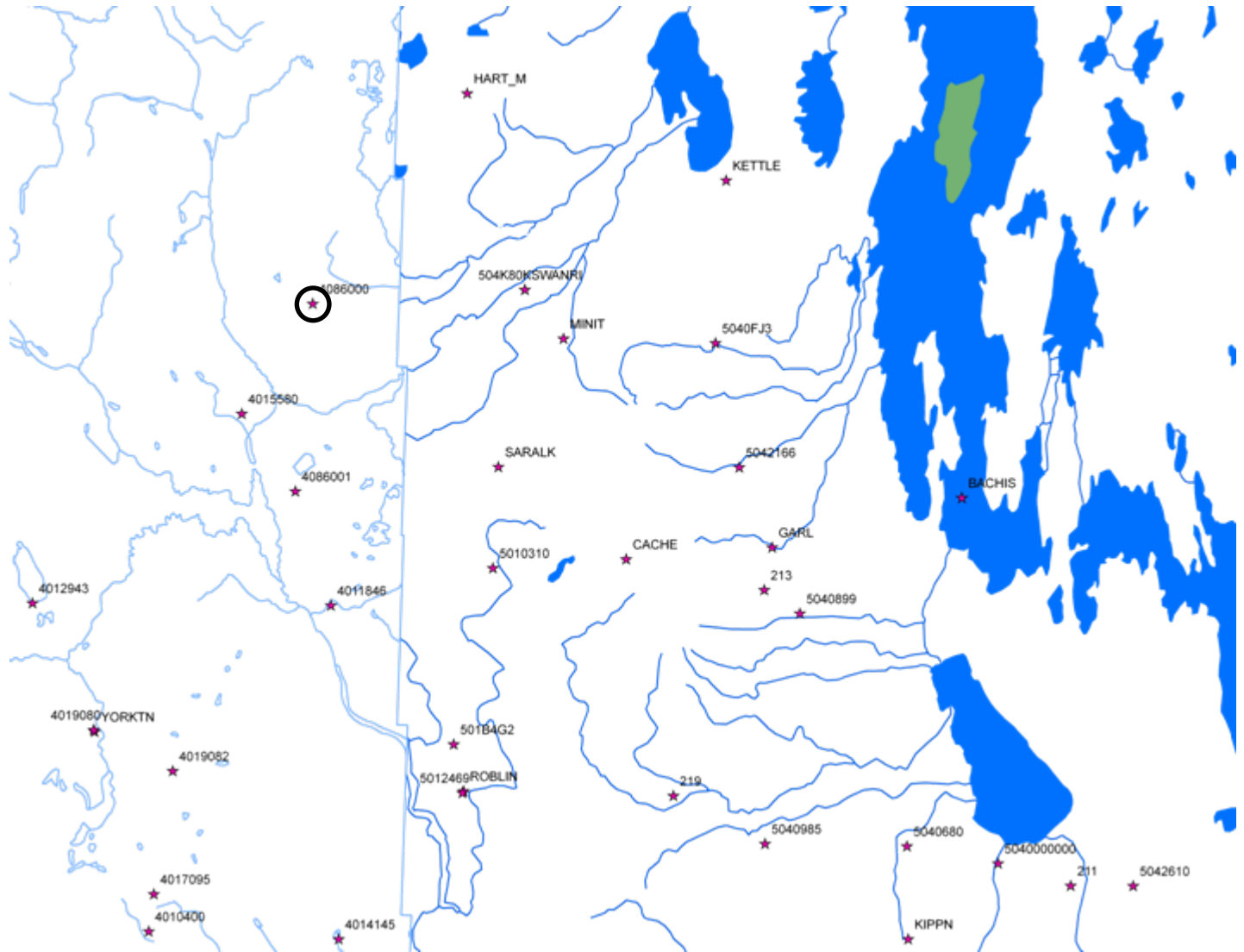
BOGGY CREEK  
ATMOSPHERIC ENVIRONMENT SERVICES DATA



# Daily mean flows of North Duck River at Cowan



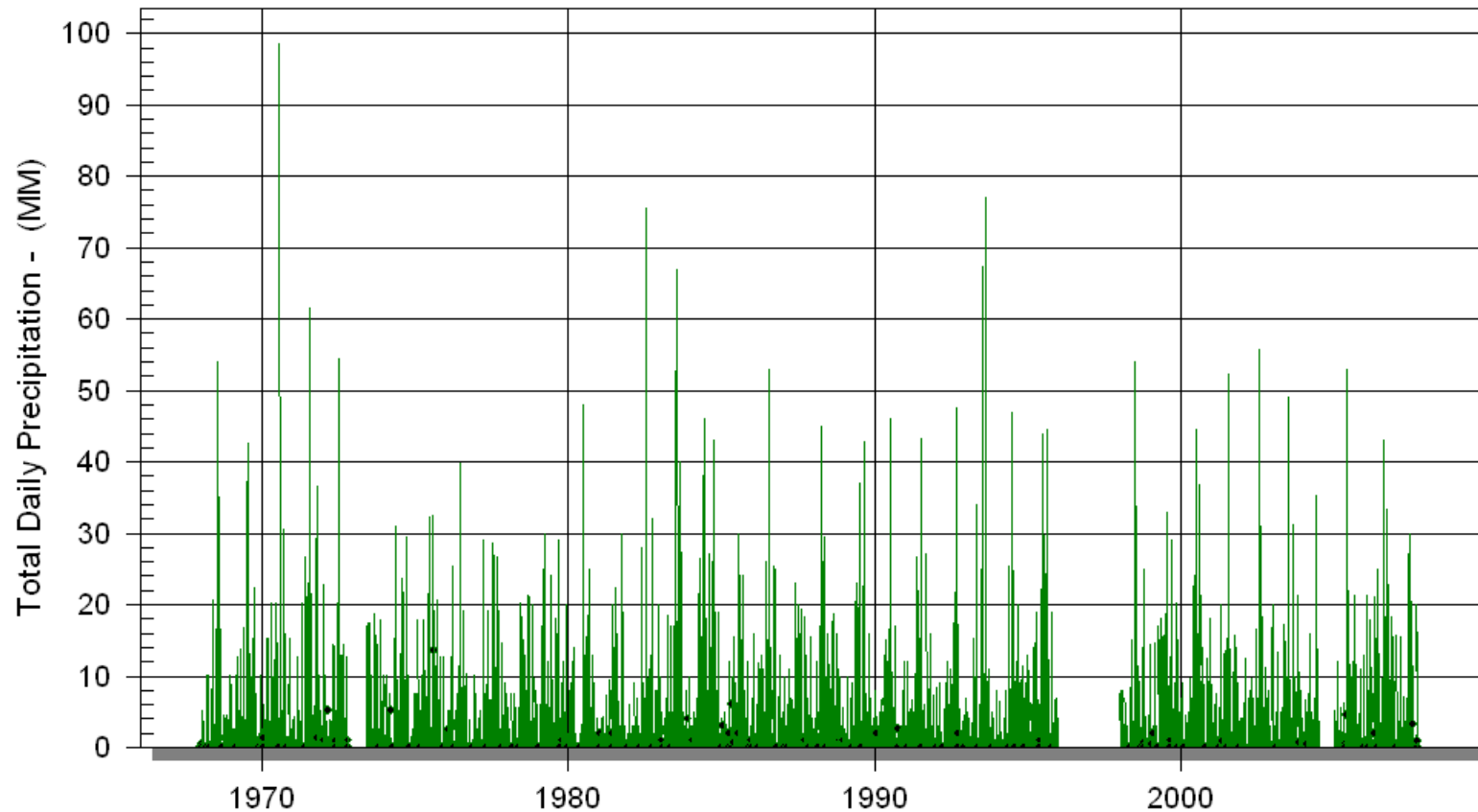
# Pelly climate station



# Precipitation

## PELLY

ATMOSPHERIC ENVIRONMENT SERVICES DATA

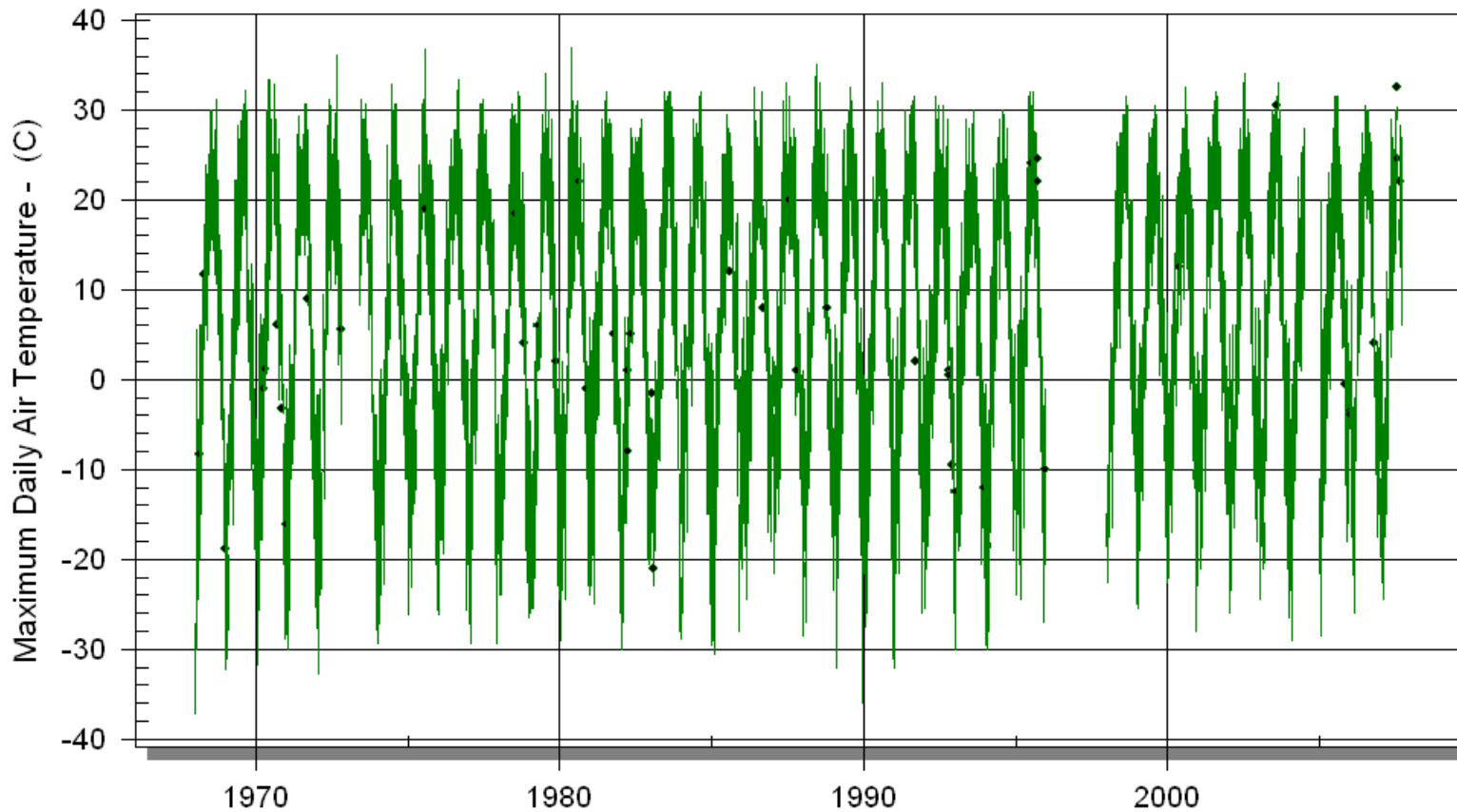


Prepared by Manitoba Water Stewardship 19 Mar 2009

# Air Temperature

PELTY

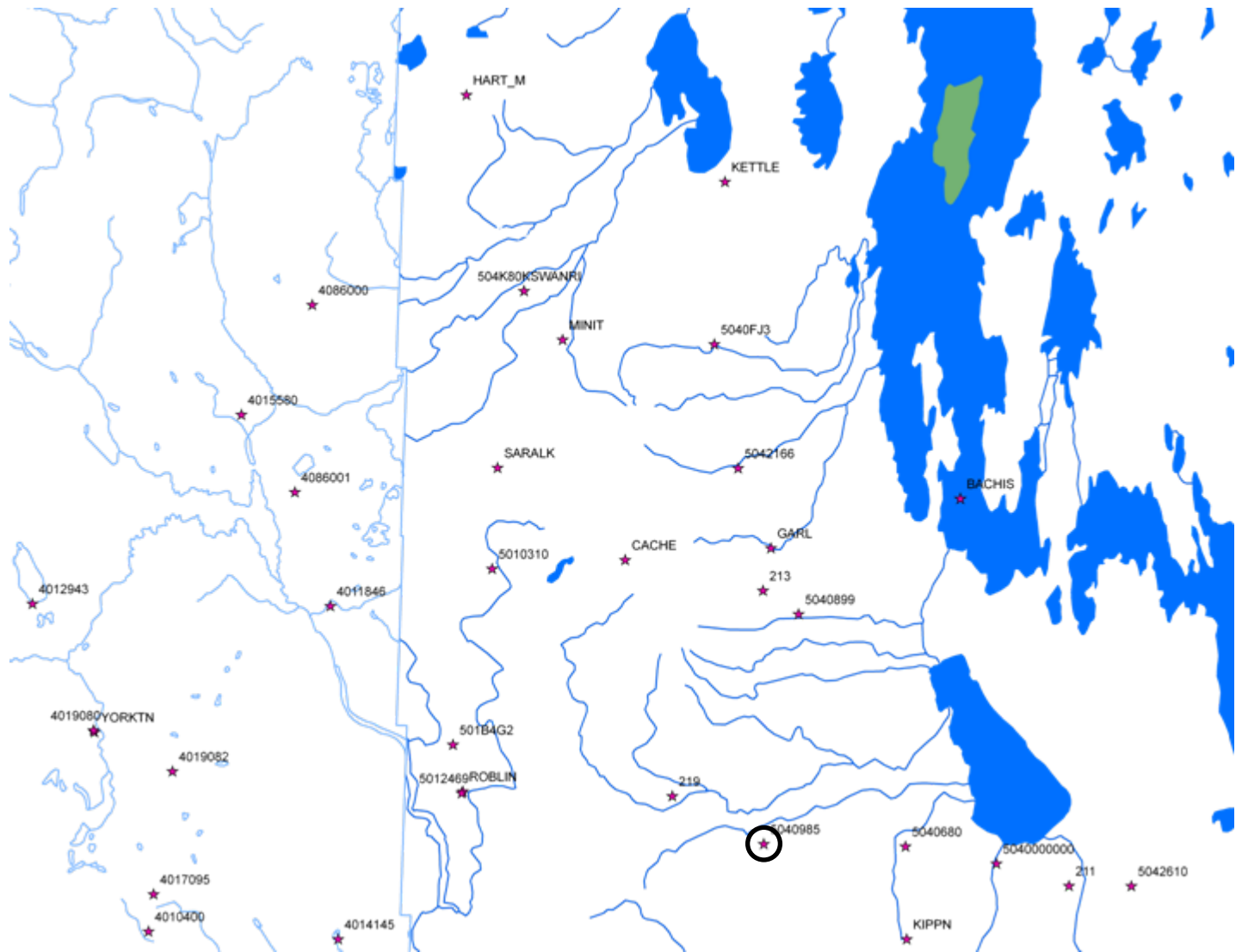
ATMOSPHERIC ENVIRONMENT SERVICES DATA



Prepared by Manitoba Water Stewardship 19 Mar 2009

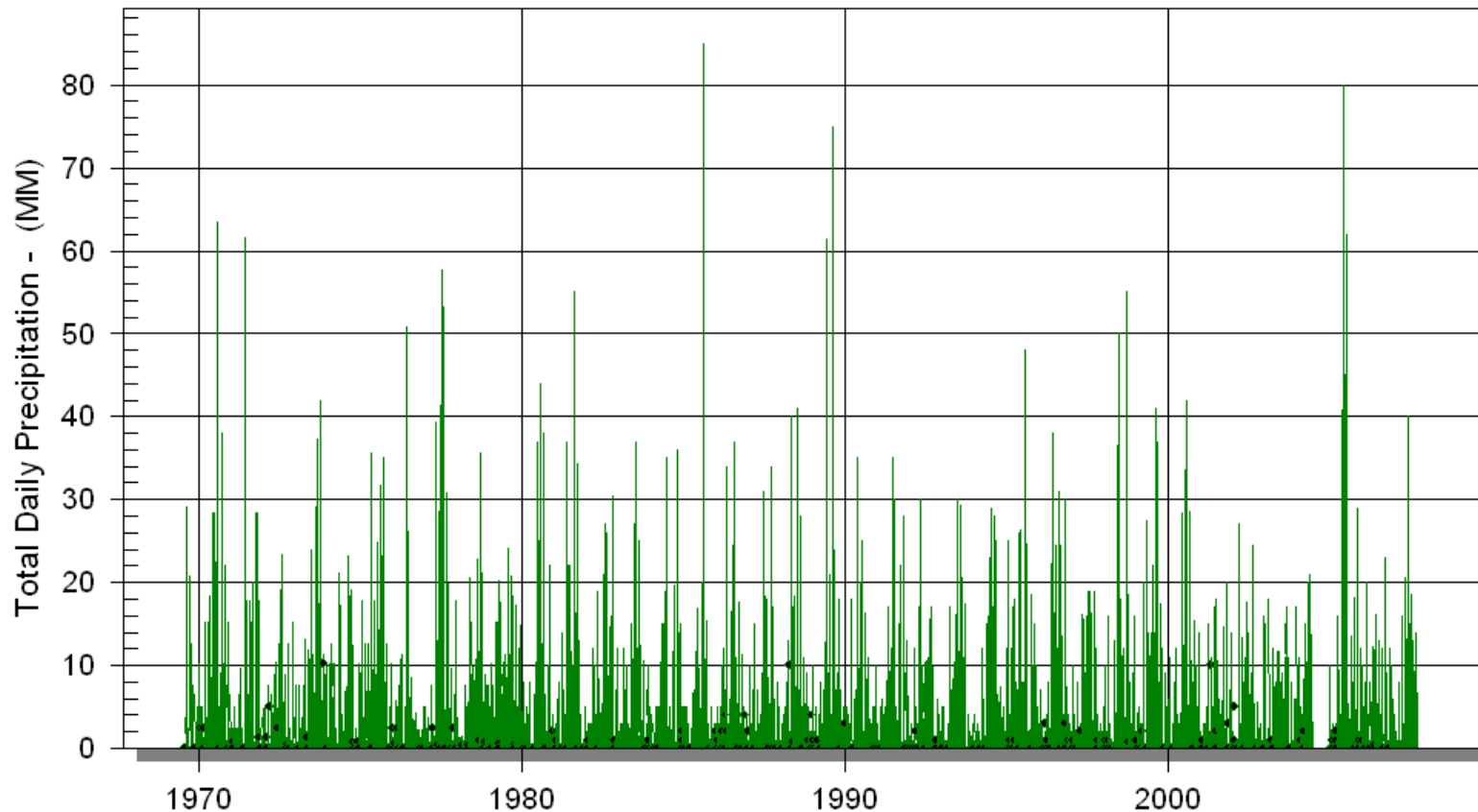


# Gilbert Plains climate station



# Precipitation

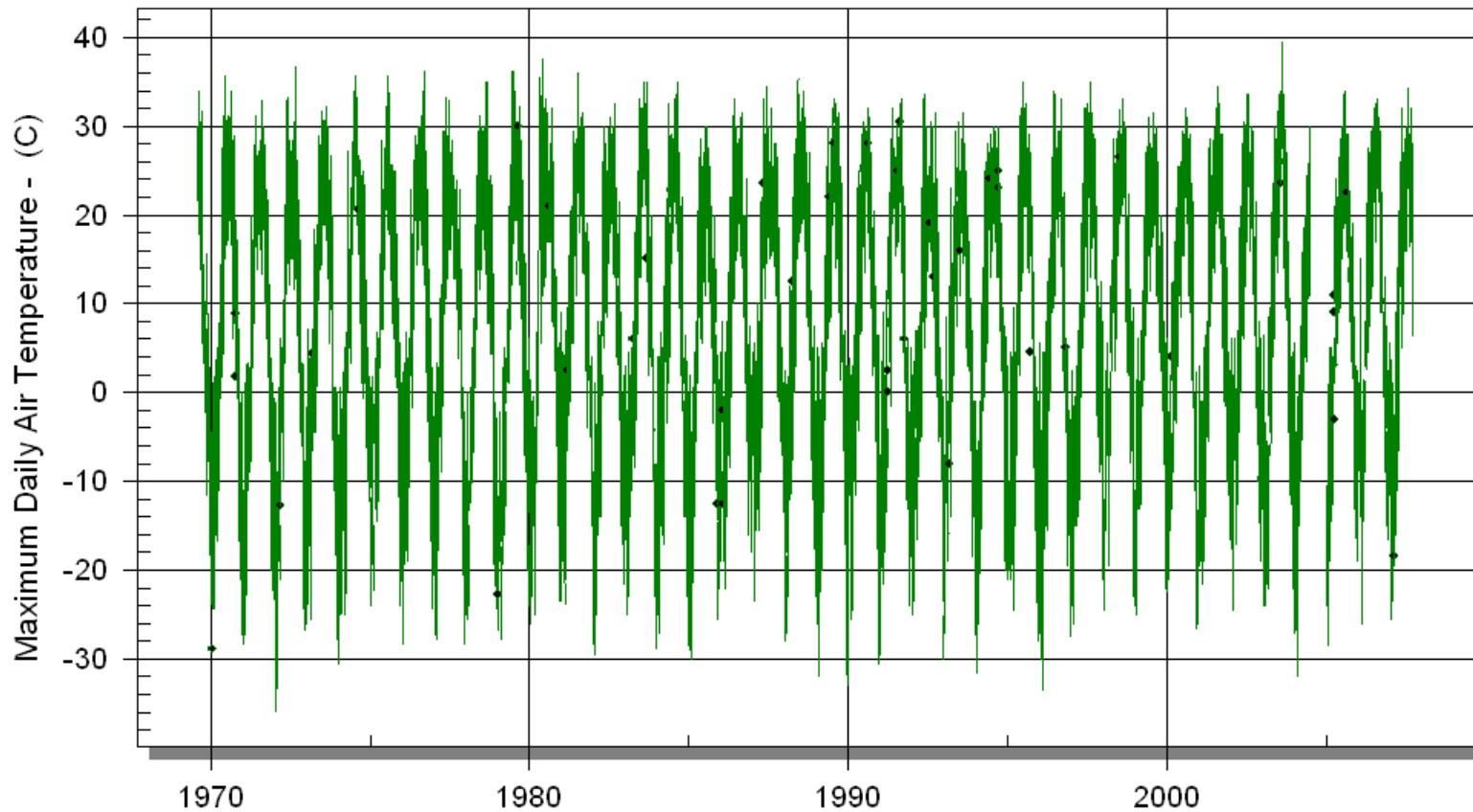
GILBERT PLAINS  
ATMOSPHERIC ENVIRONMENT SERVICES DATA



Prepared by Manitoba Water Stewardship 19 Mar 2009

# Air Temperature

GILBERT PLAINS  
ATMOSPHERIC ENVIRONMENT SERVICES DATA



Prepared by Manitoba Water Stewardship 19 Mar 2009