

DWEAC Aquatic Monitoring Program Update

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Aquatic Monitoring Program

- Community based monitoring program developed through the Dehcho AAROM (Aboriginal Aquatic Resource Ocean Management) program
- AAROM mission statement is to develop “***More Aboriginal control of fish and water resources under the Deh Cho First Nation’s ‘One House’ system of governance.....***”
- To have first nation members continuously monitoring aquatic resources in each community

Aquatic Monitoring Program

- Monitoring programs are developed according to the concerns and issues of the community
- So far the programs have been monitoring fish, fishing, water and aquatic wildlife
 - Itinerant angler surveys
 - Taking water quality measurements
 - Northern foods surveys
 - Assisting with fisheries stock assessments and other researchers
- Other community concerns?
- Increased climate has the potential to create many changes to fish stocks

Trout Lake Aquatic Monitoring Program

- The program started as an itinerant angler survey in 2001
- Lake is at risk from climate change

Number of patrols in 2013 and 2014

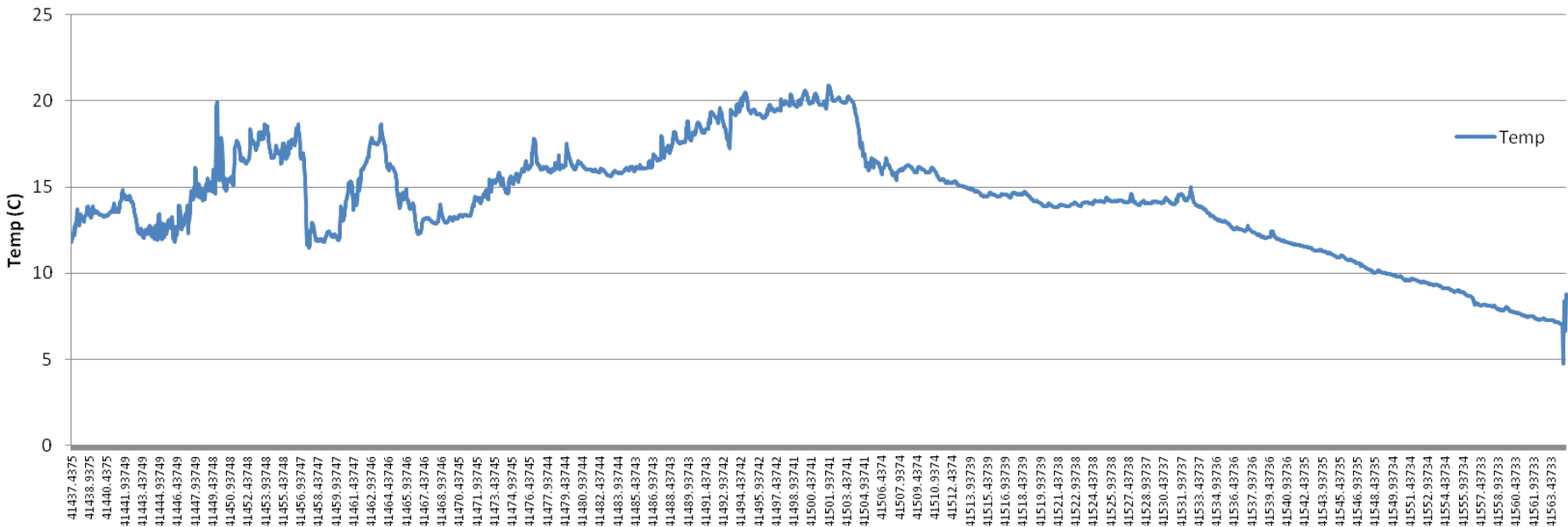
	2013	2014
Number of patrols	37	53

- Need to continue surveying anglers and tourists

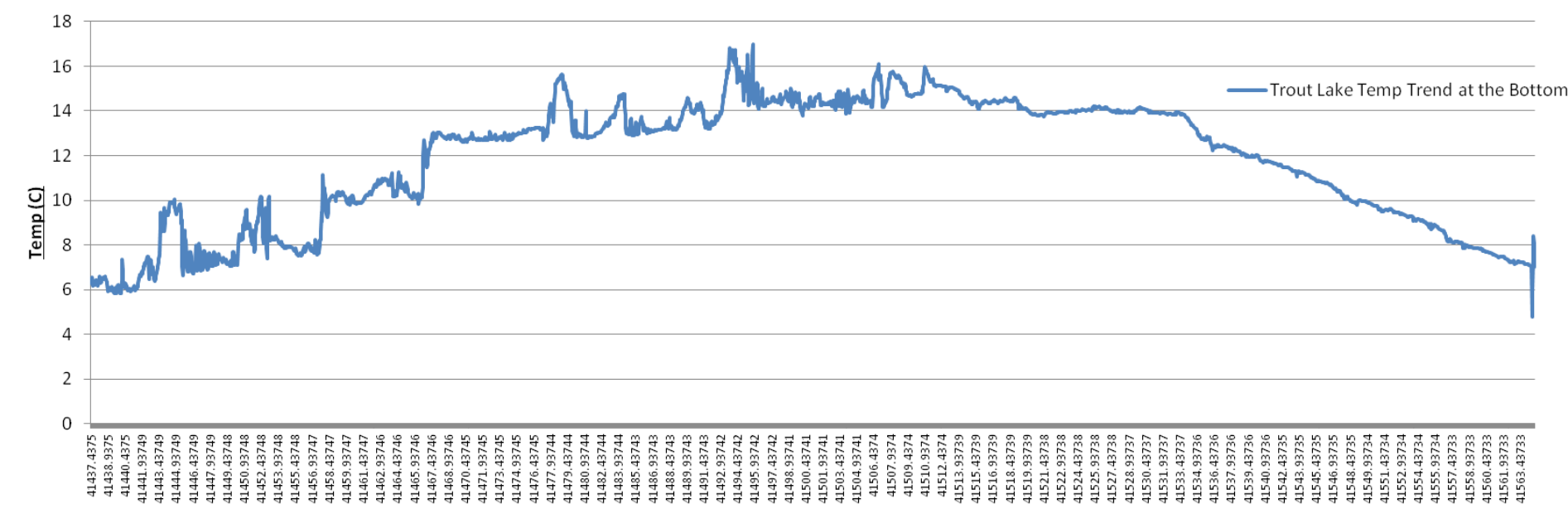
Aquatic Monitoring Program

- Temperature probes were set in the deepest part of the lake
 - 23m- 2012
- probes were spaced out every meter and recorded the temperature every hour from June 1, 2012- October 12, 2012
 - June - August 30, 2011
- Produced data that will be useful over long periods
 - Thermo- cline depth, maximum , minimum and average temperatures, mixing events

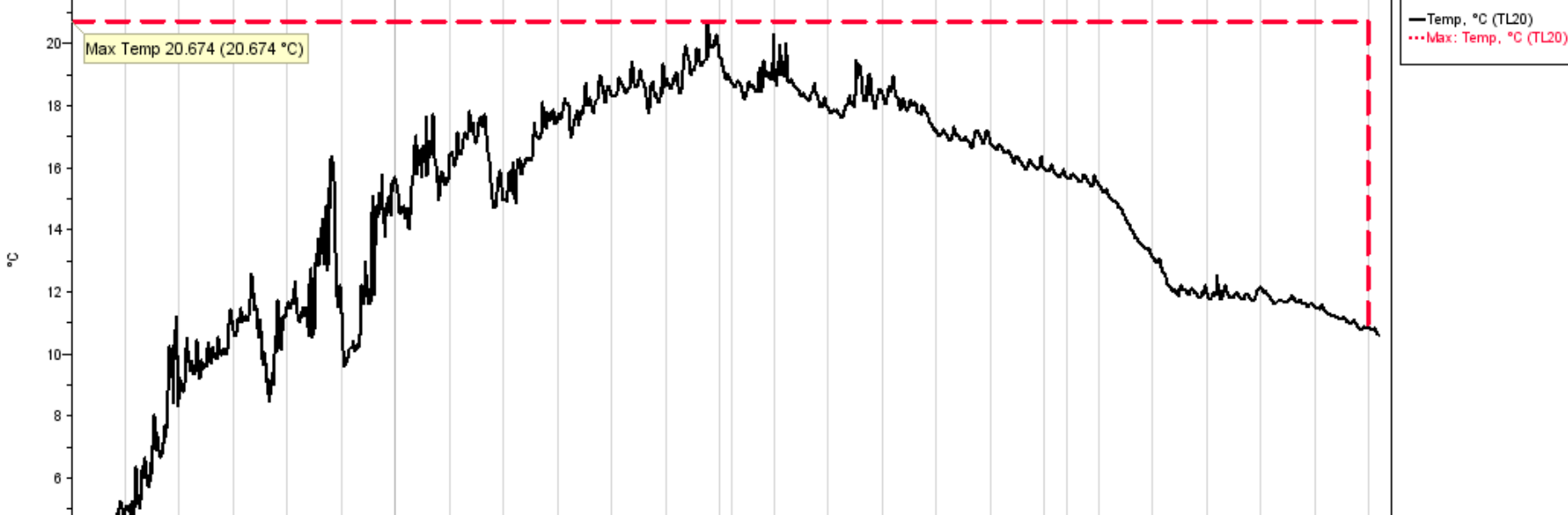
Temperature trend for Trout Lake at the surface(June 1- September 30, 2013)



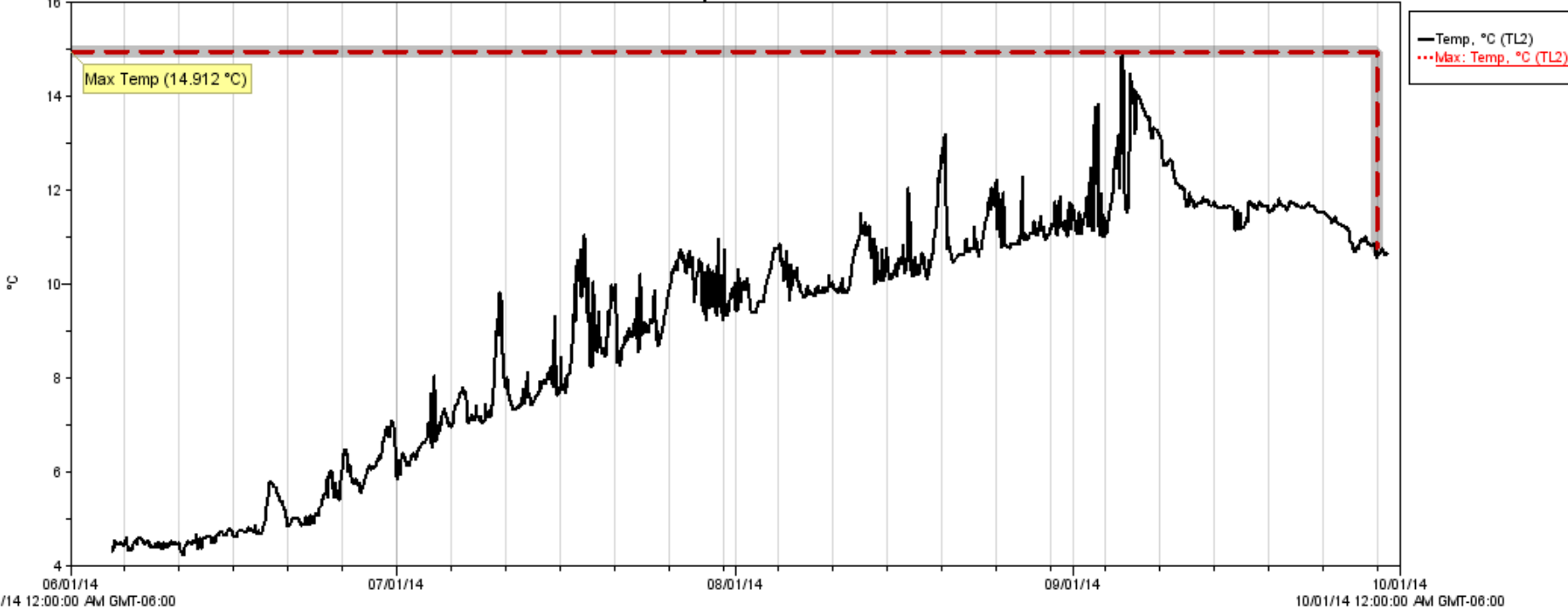
Temperature trend for Trout Lake at the surface(July 1- September 30, 2013)



Temperature trend for Trout Lake at the surface (June 5- September 30, 2014)



Trout Lake Temp Trend at the Bottom

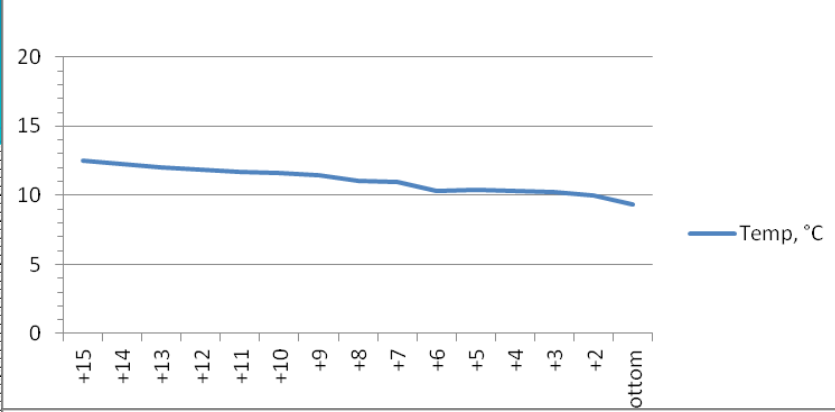


Trout Lake

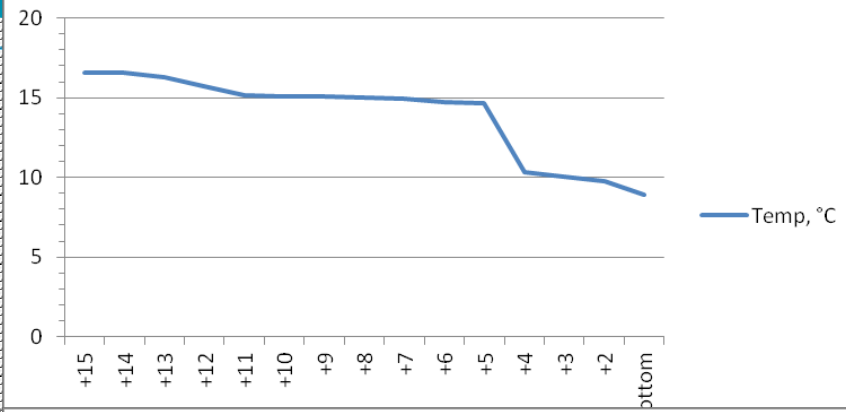
- 5th year of using temperature loggers
 - First year loggers were only set at the surface, middle and bottom
 - Tracking thermo cline
 - Important for trout habitat
 - Start monitoring “ice off”- very important for trout
- 2010 vs. 2011 vs. 2012 vs. 2013 vs. 2014

	Max Temp (c)				
	2010	2011	2012	2013	2014
Surface	19.7	20.7	20.3	20.889	20.674
Middle	17.7	17.0	15.2	15.772	16.463
Bottom	14.6	11.4	14.6	14.266	9.485

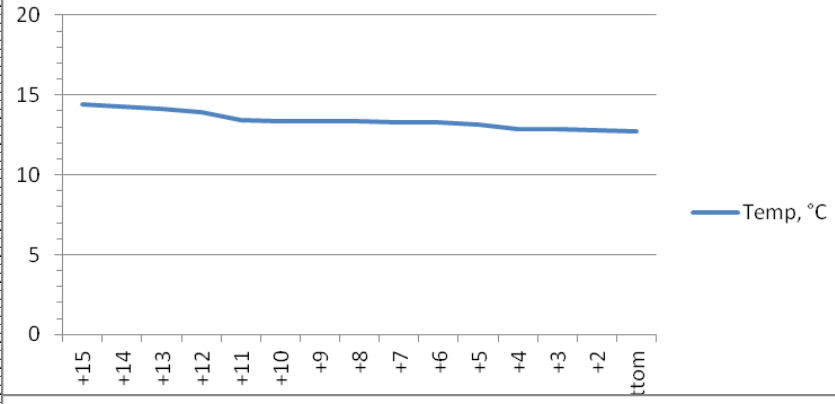
Trout Temp Profile (Week of June 19, 2013)



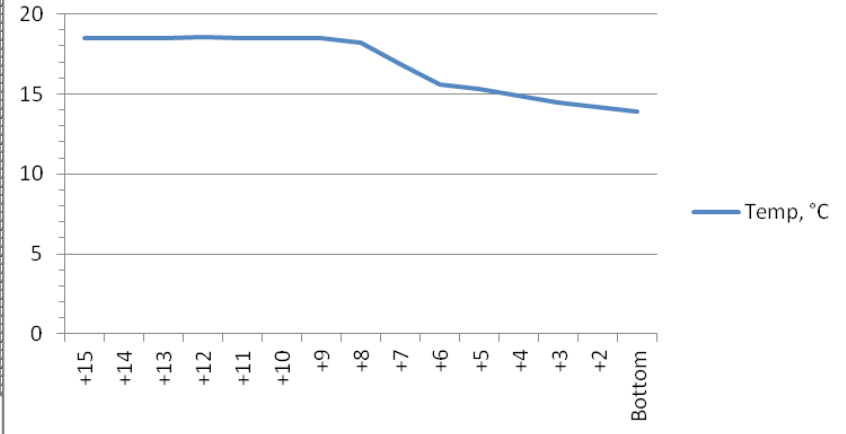
Trout Temp Profile (Week of June 26, 2013)



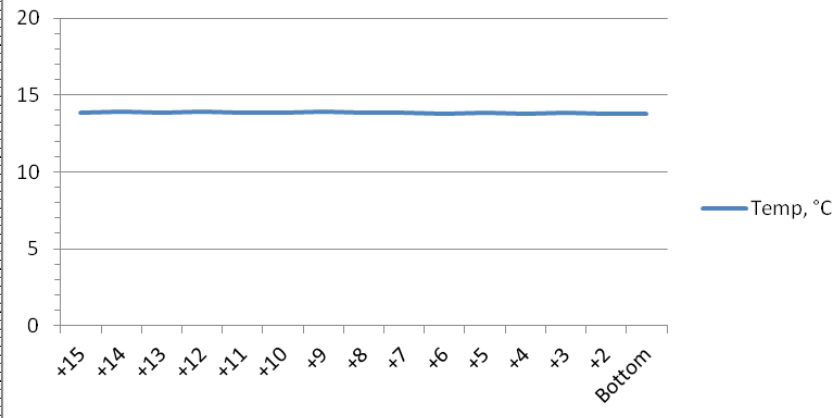
Trout Temp Profile (July 17, 2013)



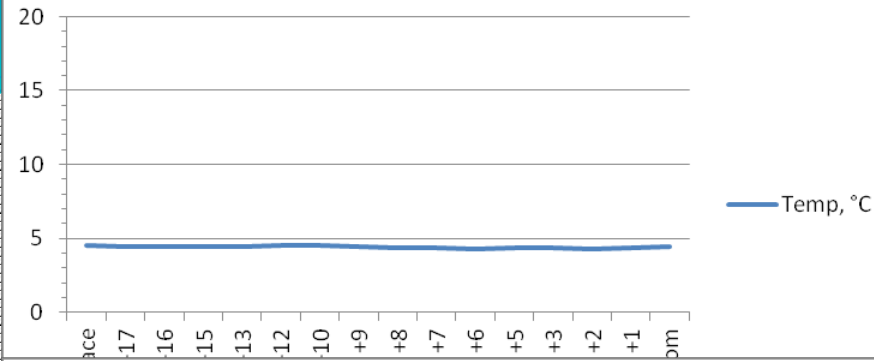
Trout Temp Profile (August 7, 2013)



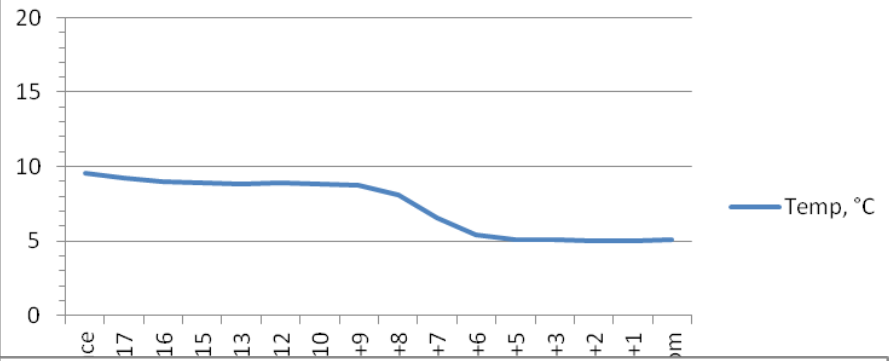
Trout Temp Profile (September 4, 2013)



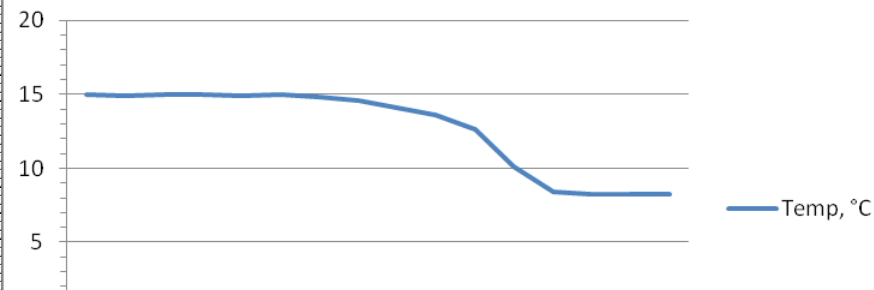
Trout Temp Profile (Week of June 5, 2014)



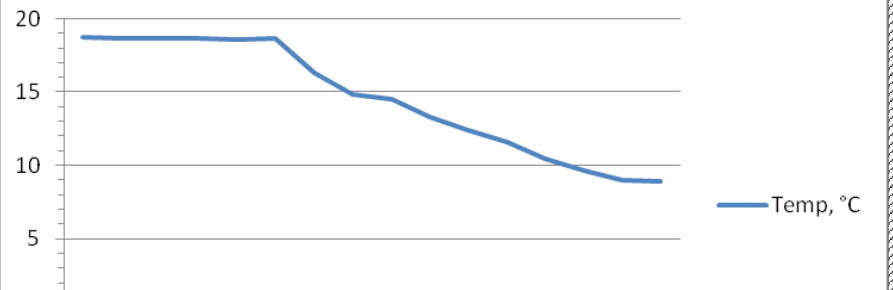
Trout Temp Profile (Week of June 19, 2014)



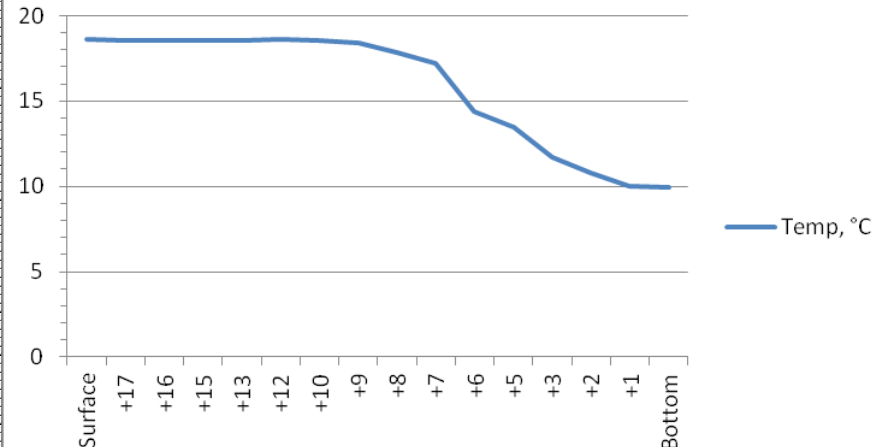
Trout Temp Profile (Week of July 10, 2014)



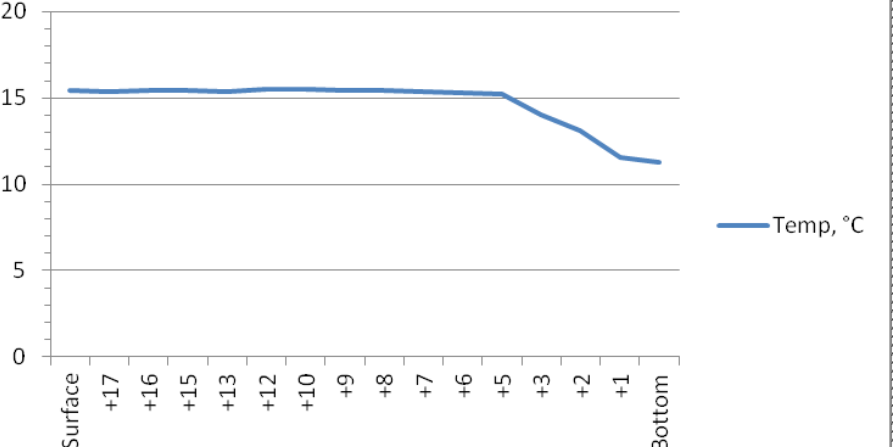
Trout Temp Profile (Week of July 24, 2014)



Trout Temp Profile (August 7, 2014)



Trout Temp Profile (September 4, 2014)



Aquatic Monitoring Program

	2013	2014
Moose	0	2
Caribou	1	0
Bears	1	2
Beavers	14	3
Muskrat	20	9
Otter	1	2
Wolf	0	1
Ducks	1058	2120
Geese	19	11
Shorebirds	124	86
Hawks	13	15
Eagles	116	83
Loons	190	246
Swans	2	33
Pelicans	0	1

Trout Lake Harvest- 2013

- Harvest was recorded by community members for fall of 2013
- Would like to do this through out the year

LKWF	NRPK	YW	LKTR	LNSK	BURB	CSCO	ARGR
881	300	121	118	130	0	10	31

History

- Kakisa River has a spring spawning run of arctic grayling

- Mid April- mid May
- Comments that spawning runs are occurring earlier

- Construction of the Mackenzie Highway caused an increase in anglers

- High pressure in the 70s, 80s, especially from Pint point
- Some over-exploitation

- Creel surveys done in the 70`s and early 80`s to help manage the fishery

- Compare to current survey

- In 1989 there was a fish kill that affected arctic grayling and was caused

How it Works

- Objective is to survey all recreational anglers on Kakisa River and Lake
- Spring grayling fishery and summer walleye and pike fishery
 - Survey runs for both fisheries and is data is separated to show this
- Beginning of the season coincides with the grayling spawning run (April)
 - Grayling is the targeted species for the first month
- Community monitor hands out surveys to anglers at the falls and the bridge, which they fill out every day
- Survey includes questions on:
 - Duration of trip, time spent fishing

How it works

- Water quality component as well
- Water temperature loggers are also deployed in the river and lake
 - Lake buoy measures temperature at the top, 3m down, 6 m down and the bottom at 9m
 - Lake buoy has yet to be located
- Water quality measurements were taken daily with handheld meters

Results

- 2013 was the 5th successful season of the angler survey
 - 2009 response rate = 27.1% (38/140)
 - 2010 response rate = 42.9%(102/238)
 - 2011 response rate = 30% (64/220)
 - 2012 response rate = 6% (3/50)
 - 2013 response rate = 25% (35/141)
- This year aprox. 150 days were worked
 - Captured half the grayling season (Mar 1 - 11)

Table 1. Summary of results for 2013

Month	Fishing Effort (hrs)	Grayling (#)			Walleye (#)			Northern Pike (#)			Total Fish
		C1	R2	K3	C1	R2	K3	C1	R2	K3	
May	89.5	85	81	4	0	0	0	8	8	0	93
June	12	0	0	0	7	3	4	6	5	1	13
July	18.5	0	0	0	0	0	0	0	0	0	0
Total	120.0	85	81	4	7	3	4	14	13	1	106

Table 2. Summary of fish caught and kept, 2009 to 2013

Fish Species	2009 (39)		2010 (102)		2011 (64)		2012 (3)		2013 (35)	
	Caught	Kept	Caught	Kept	Caught	Kept	Caught	Kept	Caught	Kept
arctic grayling	2	2	617	2	1360	2	478	0	1050	4
northern pike	137	8	177	22	120	19	3	3	14	1
yellow walleye	190	22	94	19	14	6	0	0	7	4

*Both survey data and fly fisherman data were combined for this table

Table 3. Summary of estimated catch and harvest, 2009 to 2012

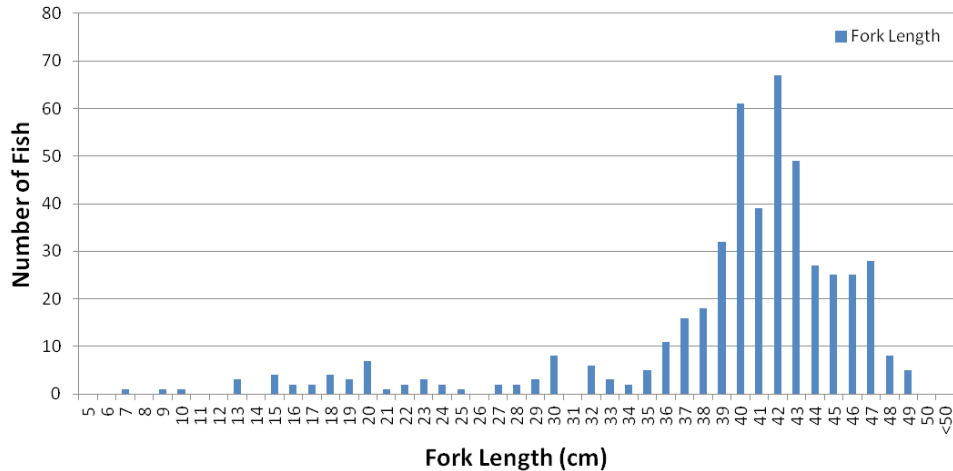
Fish Species	2009 (39)		2010 (102)		2011 (64)		2012 (3)		2013 (35)	
	Estimated Catch	Estimated Harvest	Estimated Catch	Estimated Harvest	Estimated Catch	Estimated Harvest	Estimated Catch	Estimated Harvest	Estimated Catch	Estimated Harvest
arctic grayling	*	*	2126	21	2189	25	*	*	1904	44
northern pike	680	109	268	65	570	90	*	*	84	6
yellow walleye	943	40	265	44	67	29	*	*	42	24

* Not enough data was collected to calculate an estimation

- A lot of grayling being caught, but also a high release rate
- 406 round whitefish reported being caught by fly fisherman in the spring

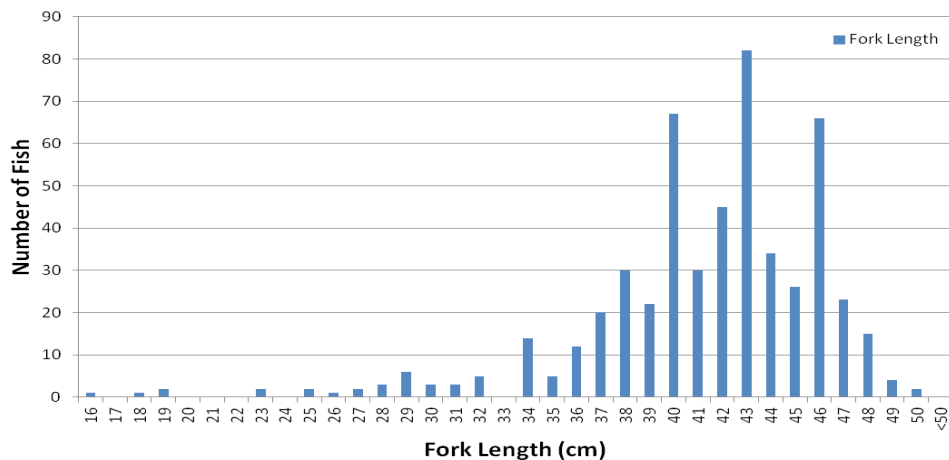
Fly Fisherman Data

Fork Length Histogram for ARGR from Kakisa River
During Spawning- April 2012



- Large size of fish
- If there is pressure from angling, the average size of fish will decrease
- Need to keep collecting length data

Fork Length Histogram for ARGR from Kakisa River
During Spawning- April/ May 2013



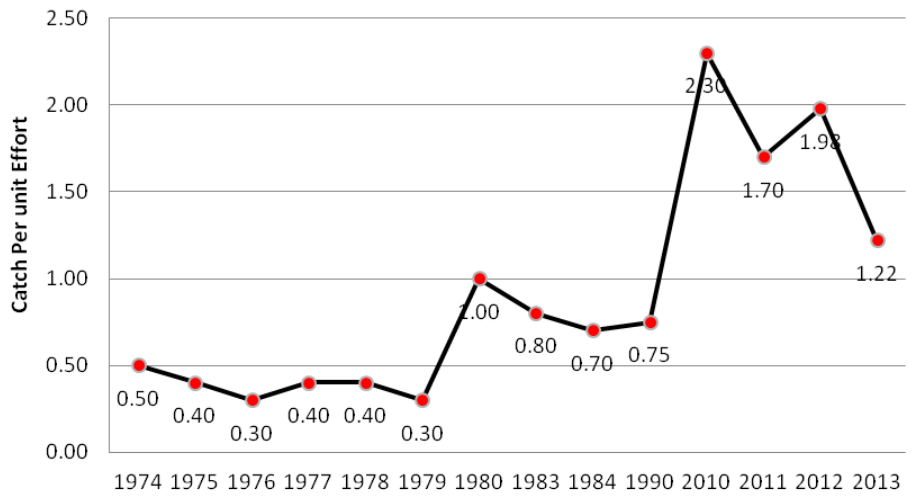
89% of surveys given out in May (2013)

- Deh Cho bridge is open
- 14/ 35 surveys from Yellowknife
 - 4/ 16 surveys from YK during grayling run
 - Want to maintain monitoring

Now starts May 1st at the latest

- The NWT fly- fisherman have also been collecting data during the important grayling spawning season (mid April- mid May)
 - Measuring and counting all fish
 - Less fly- fisherman

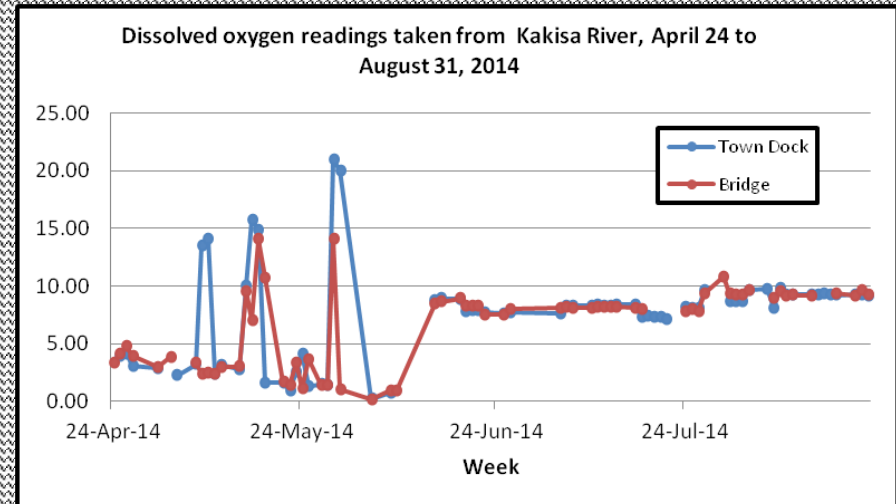
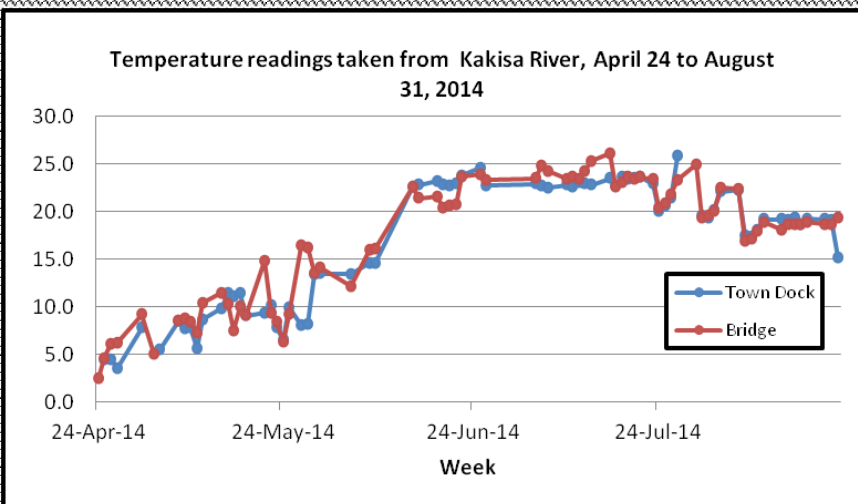
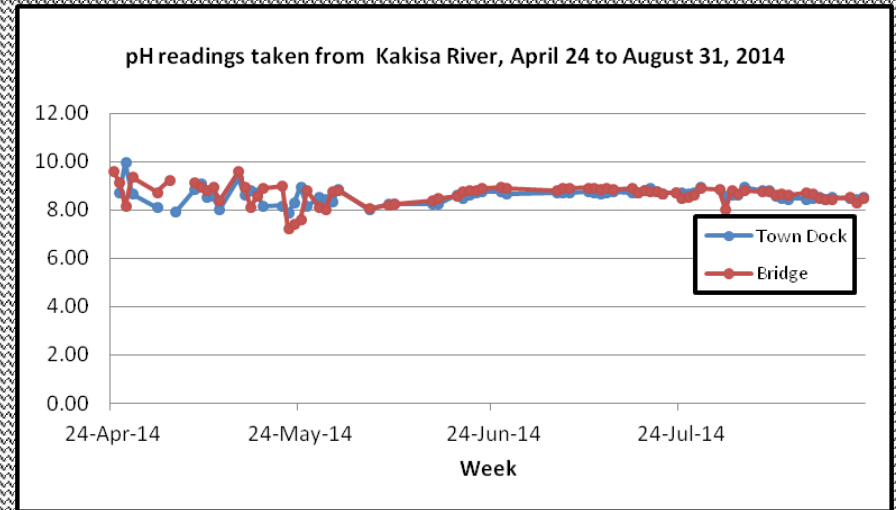
Catch Per Unit Hour for Spring Spawning Arctic Grayling on Kakisa River, NT, 1974- 2013



Spring		
Year	ARGR CPUE	# of ARGR
2011	5	1293
2012	1.98	478
2013	5.48	965

Results

- 2014 there were less surveys given out and returned
 - 46 given out/ 4 returned
 - Not enough data to be significant
- 93 days worked- full summer
- 13 grayling caught and released
- 1 pike caught and released
- Water quality monitoring



Fort Simpson Aquatic Monitoring Program

- Monitoring program is developed according to the concerns and issues of the community
- Fort Simpson has lots of river traffic and a budding recreational fishery
- Monitoring program was built around an angler and river survey
 - River traffic
 - Wildlife
 - Birds
- Very important in the CBM

How it Works

- Program starts the beginning of June
 - Runs until September
- Monitors patrol the Mackenzie River between Camsell bend and Rabbitskin
 - Recording River traffic and wildlife
- Recording water quality with handhelds at Rabbitskin,
- Sonde set up on the Mackenzie before the Liard
- Angler survey includes questions

Results- 2013

Survey Week	Surveys Returned (#)	Fishing Effort (hrs)	Walleye (#)			Northern Pike (#)			Grayling (#)			Total Fish
			C1	R2	K3	C1	R2	K3	C1	R2	K3	
July	1	1	0	0	0	1	1	0	0	0	0	1
Total	1	1	0	0	0	1	1	0	0	0	0	1
Mean												
% Kept			N/A			0%			N/A			0%
% Released			N/A			100%			N/A			100%
Fish caught per angler day (#)			N/A			N/A			N/A			N/A
Fish caught per angler hour (#)			N/A			N/A			N/A			N/A

- Only one survey was returned
- 23 given out

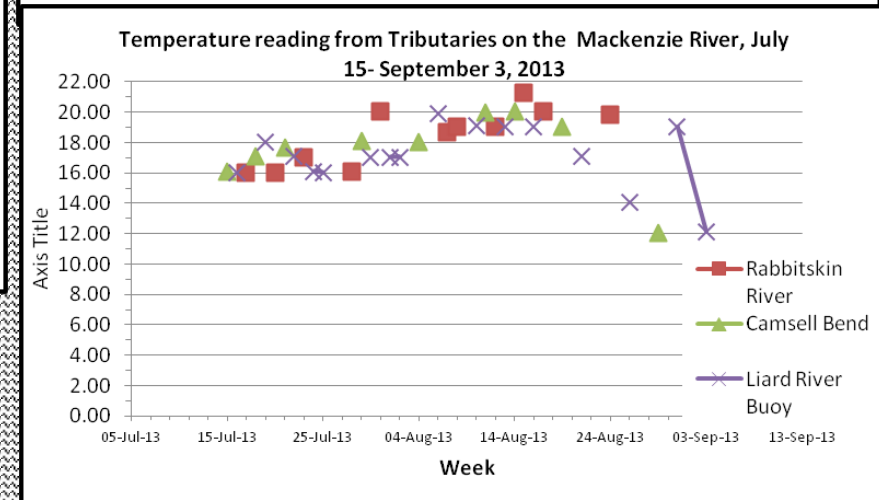
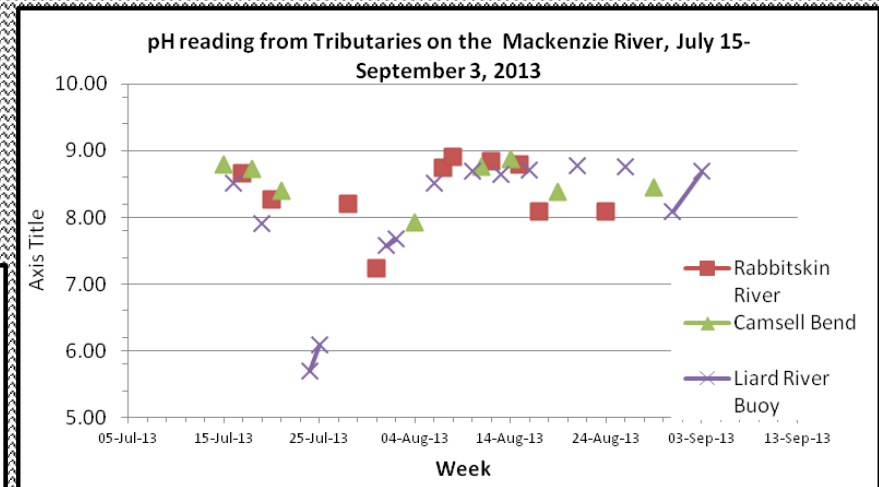
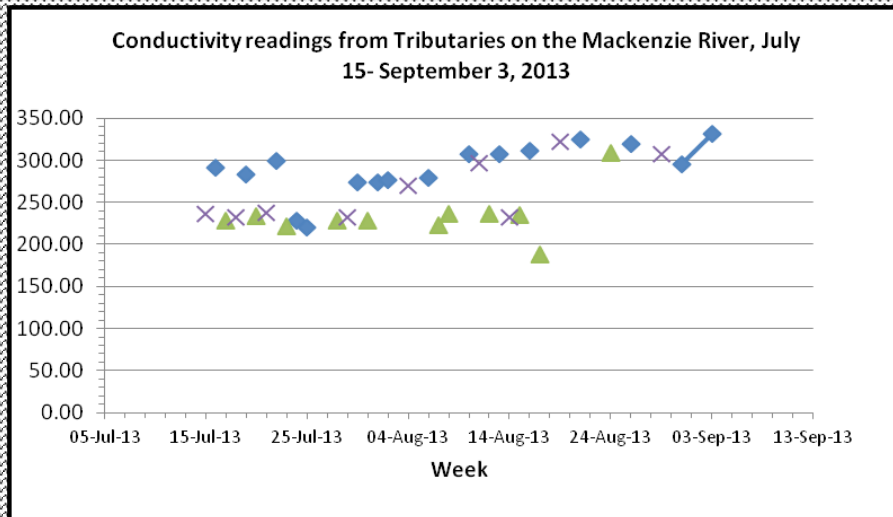
Results- 2014

Survey Week	Surveys Returned (#)	Fishing Effort (hrs)	Walleye (#)			Northern Pike (#)			Inconnu (#)			Total Fish
			C1	R2	K3	C1	R2	K3	C1	R2	K3	
June	3	6	0	0	0	4			2			6
Total	1	6	0	0	0	4			2			6
Mean												
% Kept			N/A			N/A			N/A			N/A
% Released			N/A			N/A			N/A			N/A
Fish caught per angler day (#)			N/A			N/A			N/A			N/A
Fish caught per angler hour (#)			N/A			N/A			N/A			N/A

- Only one survey was returned
- 39 given out

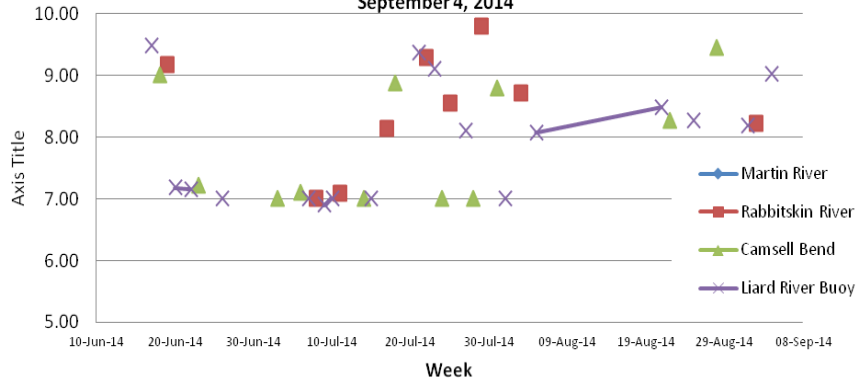
Results- 2013

- Monitors are recording water quality for tributaries along the Mackenzie River
 - Important to monitor for fish stocks that use these for feeding and spawning

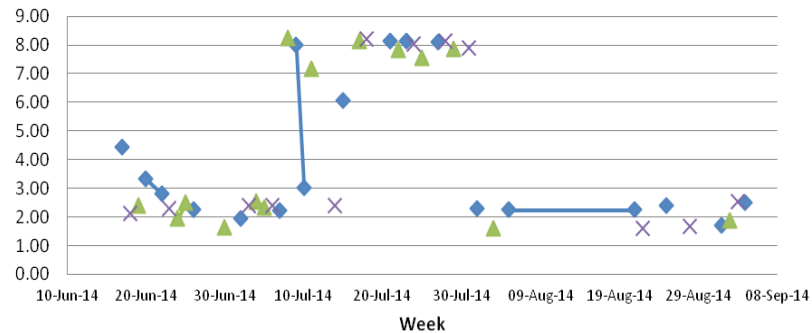


Results- 2014

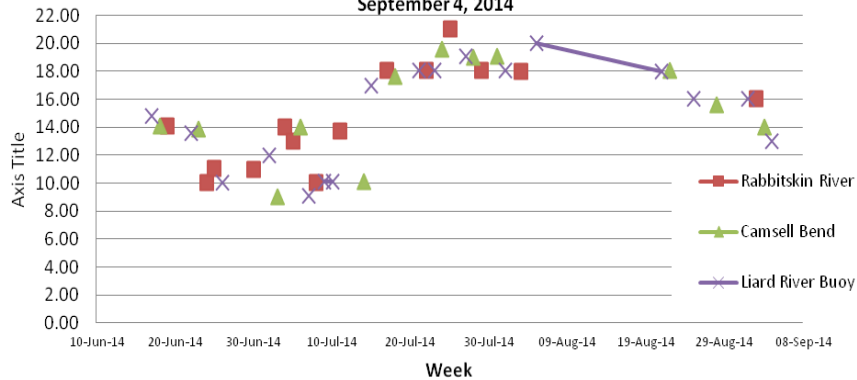
pH reading from Fort Simpson on the Mackenzie and Liard Rivers River, June 17- September 4, 2014



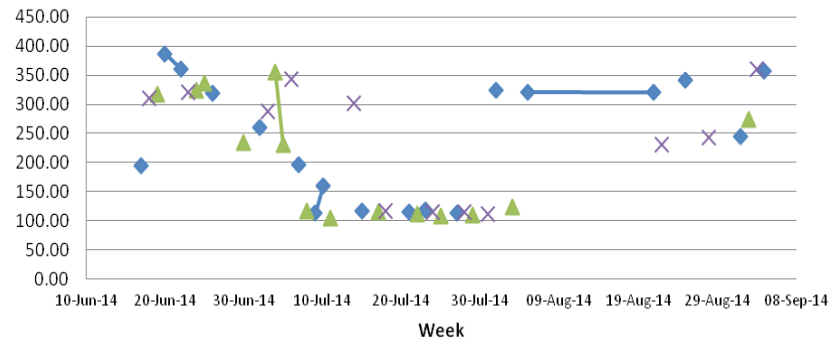
Dissolved Oxygen readings from Fort Simpson on the Mackenzie and Liard Rivers, June 17- September 4, 2014



Temp reading from Fort Simpson on the Mackenzie and Liard Rivers River, June 17- September 4, 2014



Conductivity readings from Fort Simpson on the Mackenzie and Liard Rivers, June 17- September 4, 2014



Wildlife Observations

	2013	2014
Moose	1	2
Caribou	0	0
Bears	32	18
Buffalo	1	0
Beavers	6	4
Muskrat	2	4
Otter	0	0
Mink	3	0
Lynx	3	0
Wolf	2	0
Ducks	669	1684
Geese	547	1546
Shorebirds	366	994
Hawks	100	56
Eagles	21	139
Loons	21	8
Swans	3	0
Cranes	239	74



Thank You/ Mahsi Cho