

Learning by Doing Monitoring Committee

LBD Monitoring Plan – Task 1.2 Compile information about other know ongoing monitoring efforts

A summary of all monitoring efforts in Grand County was prepared for 2017. The task involved compiling 2017 monitoring plans from several entities including:

- Bureau of Land Management
- Colorado Parks and Wildlife
- Colorado River Water Conservancy District
- Denver Water
- East Grand Water Quality Board
- Grand County
- Grand County Water Information Network
- Northern Water
- Trout Unlimited
- US Geological Survey

The 2017 monitoring summary presented is an anticipated sampling plan based on the information provided by the entities. Changes can occur in timing and frequency of sampling events, sites can be added or removed. There were a few assumptions made in timing of sample collection:

- Denver Water collects quarterly and bi-annual samples at several sites. The quarterly samples were put into the matrix in January, April, July and October. The biannual sampling was put into the matrix in June and September.
- CPW collects fish data bi-annually and annually. The bi-annual sampling was put into the matrix in April and September; the annual in September.

Previous years monitoring plans could be different from and could also include other entities who may have collected data compared to the 2017 summary. For example, in some years the Colorado Division of Water Quality collects data in Grand County for review of water quality standards.

Station Normalization

There were originally 180 stations in the sampling matrix. In effort to normalize and streamline sampling efforts, each sampling station was assigned a river mile ID. This was done using the coordinates provided by the sampling entities and mapping the sites using a center river line. This allowed for sites located in the same place but sampled by different entities to be grouped together as a single site. After grouping the sites by river mile ID, there were 112 stations in the matrix.

The river mile ID is composed of abbreviated text representing the water body followed by a numeric value representing the river mile. For example, the river mile ID for the Colorado River at river mile 10 is

CR-10. River mile zero is located at the most downstream portion of a waterbody, generally the confluence with a larger river. For the Colorado River, river mile zero is at the Grand County boundary line. The river miles increase at upstream sites.

The following abbreviations were used when assigning the River Mile ID's:

River Name	Site Abbreviation
Antelope Creek	ATC
Arapaho Creek	AC
Blue River	BL
Bobtail Creek	BC
Church Creek	CH
Colorado River	CR
Crooked Creek	CC
East Inlet	EI
Fraser River	FR
Granby Pump Canal	GRP
Grand Lake	GL
Lake Granby	GR
McQuery Creek	MQC
Muddy Creek	MC
North Fork of Colorado	NF
North Inlet	NI
Ranch Canal	RCC
Ranch Creek	RC
Reeder Creek	RDC
Roaring Fork	RF
Shadow Mountain	SM
South Fork	SF
St Louis Creek	STC
Steelman Creek	SC
Stillwater Creek	ST
Trail Creek	TR
Vasquez Canal	VCC
Vasquez Creek	VC
Williams Fork	WF
Willow Creek	WC
Willow Creek Pump Canal	WCP
Willow Creek Reservoir	WC
Windy Gap Pump Canal	WGP
Windy Gap Reservoir	WG

Matrix Summary

The monitoring matrix was geographically sectioned to make it easier to digest. The following geographic sections were used:

1. Colorado River - Grand County Line to Williams Fork
2. Colorado River -Williams Fork to Windy Gap
3. Colorado River - Upstream of Windy Gap to Headwaters
4. Fraser River - Colorado River to Winter Park
5. Williams Fork

There were three general categories used to group the type of sampling done at a site:

1. Water Quality – Includes analysis done at a laboratory (metals, nutrients, ions, etc.). This also includes measurements taken in the field (pH, temperature, flow, etc.).
2. Temperature – Time series data collected with a sensor placed in the stream.
3. Aquatic Life – This includes macroinvertebrate and fish sampling.

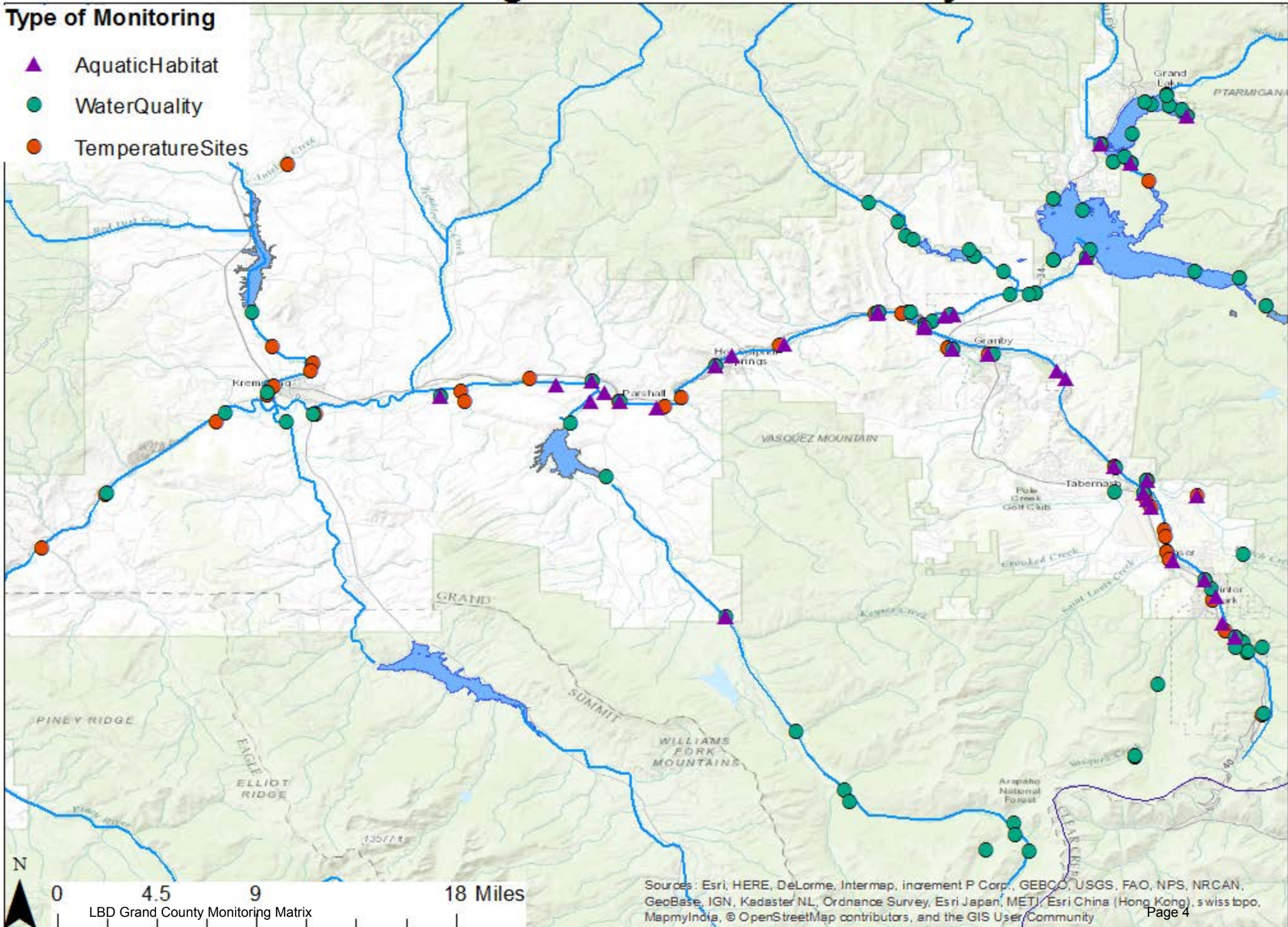
There are four parts included with each geographic section:

1. Map – The map shows the sites in the section labeled with the river mile ID and indicates what type of sampling is done at each site.
2. Station List – A list of the stations which includes the river mile ID, the entity ID, a site description, the entity, and what type of data are collected at that site.
3. Parameter List – This is a table of parameter groups which are collected specific to the geographic location. The parameter groups are specific to the sampling entity. The group names are an abbreviation of the sampling entity followed by a number, which is a count of how many different groups that entity samples. Details are provided specific to each parameter list.
4. Monitoring Plan – This is the sampling schedule which shows when each parameter list is collected at each site. The plan is on a weekly schedule to account for bi-weekly sampling carried out by some entities. There is highlighting to indicate when temperature sensors are installed at applicable sites.

Monitoring Sites in Grand County

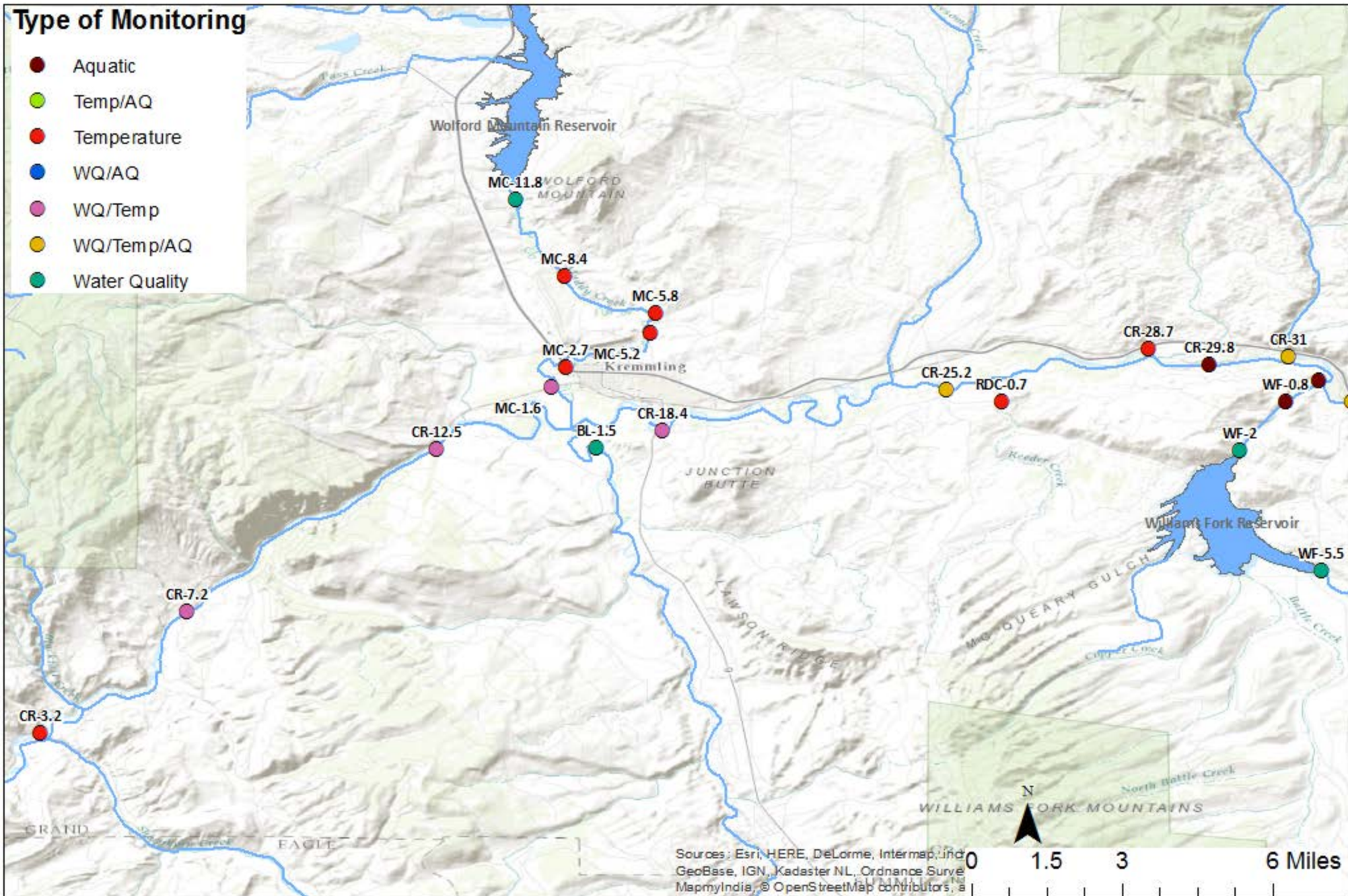
Type of Monitoring

- ▲ AquaticHabitat
- WaterQuality
- TemperatureSites



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swiss topo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Colorado River Grand County Line to Williams Fork



Colorado River - Grand County Line to Williams Fork

River Mile ID	Entity Station ID	River Mile	Description	Entity	Type	Location
ATC-1.8	AC-Lower	1.8	Antelope Creek - Lower	BLM	Temperature	Antelope Creek
BL-1.5	WS-BL-023	1.5	Blue River upstream of confluence with Colorado River	Denver Water	Water Quality	Blue River
CR-3.2	COR-Rad	3.2	Colorado River - BLM site at Radium	BLM	Temperature	Colorado River
CR-7.2	COR-Pumphouse	7.2	Colorado River blw Gore Canyon abv Pumphouse	BLM	Temperature	Colorado River
CR-7.2	WS-CO-002	7.2	Colorado River 100 yards upstream of Gore Trail trailhead	Denver Water	Water Quality	Colorado River
CR-12.5	09058000	12.5	Colorado River near Kremmling	CRWCD	Temperature	Colorado River
CR-12.5	WS-CO-006	12.5	Colorado River at upstream end	Denver Water	Water Quality	Colorado River
CR-18.4	COR-Hwy9	18.4	Colorado River above Hwy 9 Bridge at Kremmling	BLM	Temperature	Colorado River
CR-18.4	WS-CO-004	18.4	Colorado River at Kremmling (@ bridge on Colo 9)	Denver Water	Water Quality	Colorado River
CR-25.2	COR-KBDitch	25.2	Colorado R at KB Ditch	GCWIN	Temperature	Colorado River
CR-25.2	COR-KBDitch	25.2	Colorado R at KB Ditch	GCWIN	Macroinvertebrate	Colorado River
CR-25.2	COR-KBDitch	25.2	Colorado R at KB Ditch	GCWIN	Water Quality	Colorado River
CR-28.7	COR-ConRitschard	28.7	Colorado R at ConRitschard	GCWIN	Temperature	Colorado River
CR-29.8		29.8	Parshall-Sunset	CPW	Fish	Colorado River
CR-31	COR-KidPond	31	Colorado R above Kid Fishing Pond	GCWIN	Temperature	Colorado River
CR-31	COR-KidPond	31	Colorado R above Kid Fishing Pond	GCWIN	Macroinvertebrate	Colorado River
CR-31	COR-KidPond	31	Colorado R above Kid Fishing Pond	GCWIN	Water Quality	Colorado River
MC-1.6	MC-blwKSD	1.6	Muddy Creek below Kremmling Sanitation	GCWIN	Temperature	Muddy Creek
MC-1.6	WS-CO-005	1.6	Muddy Creek between Colorado River confluence and US 40 at Peak Ranch bridge above	Denver Water	Water Quality	Muddy Creek
MC-11.8	09041400	11.8	Muddy Creek below Wolford Mtn. Reservoir6	CRWCD	Water Quality	Muddy Creek
MC-2.7	MC-blwHwy40	2.7	Muddy Creek below Hwy 40 Bridge	BLM	Temperature	Muddy Creek
MC-5.2	MC-blwGRRGC	5.2	Muddy Creek below Gore Range Rod and Gun Club	GCWIN	Temperature	Muddy Creek
MC-5.8	MC-abvGRRGC	5.8	Muddy Creek above Gore Range Rod and Gun Club	GCWIN	Temperature	Muddy Creek
MC-8.4	MC-blwCOW	8.4	Muddy Creek below Cow Creek	GCWIN	Temperature	Muddy Creek
RDC-0	REE-Upper	0	Reeder Creek, upper	BLM	Temperature	Reeder Creek
RDC-0.7	REE-Lower	0.7	Reeder Crk above footbridge, blw irrigation ditch	BLM	Temperature	Reeder Creek

Colorado River - Grand County Line to Williams Fork

General Field Parameters	DW1	GW1	GW2	RD1	AQ1	AQ2
Temperature	X	X	X			
Dissolved Oxygen	X	X	X			
Specific Conductance	X	X	X			
pH	X	X	X			
Turbidity	X	X	X			
Flow	X	X	X			

Major Ions (plus carbon and misc)

Calcium		X	X			
Magnesium		X	X			
Potassium						
Sodium		X				
Chloride		X				
Sulfate		X				
Total Organic Carbon						
Total Alkalinity	X	X				
Total Suspended Solids	X	X				
Total Dissolved Solids						
Ecoli			X			

Metals

ICPMS Total/Dis Suite*	X					
Iron, total		X	X	X		
Aluminum, total		X	X			
Arsenic, total		X				
Chromium, total						
Manganese, total		X		X		
Aluminum, dis		X	X			
Copper, dis		X	X			
Iron, dis		X	X	X		
Manganese, dis		X		X		
Arsenic, dis		X				
Boron, dis						
Cadmium, dis		X				
Chromium, dis						
Lead, dis		X	X			
Nickel, dis						
Selenium, dis		X				
Silver, dis						
Uranium, dis						
Zinc, dis		X				

Nutrients

TKN						
NH3 as N		X	X			
NO3			X			
NO3+NO2		X				
Ortho P						
P Total	X	X	X			
chlorophyll a						

Aquatic Habitat

Macroinvertebrates					X	
Fish						X

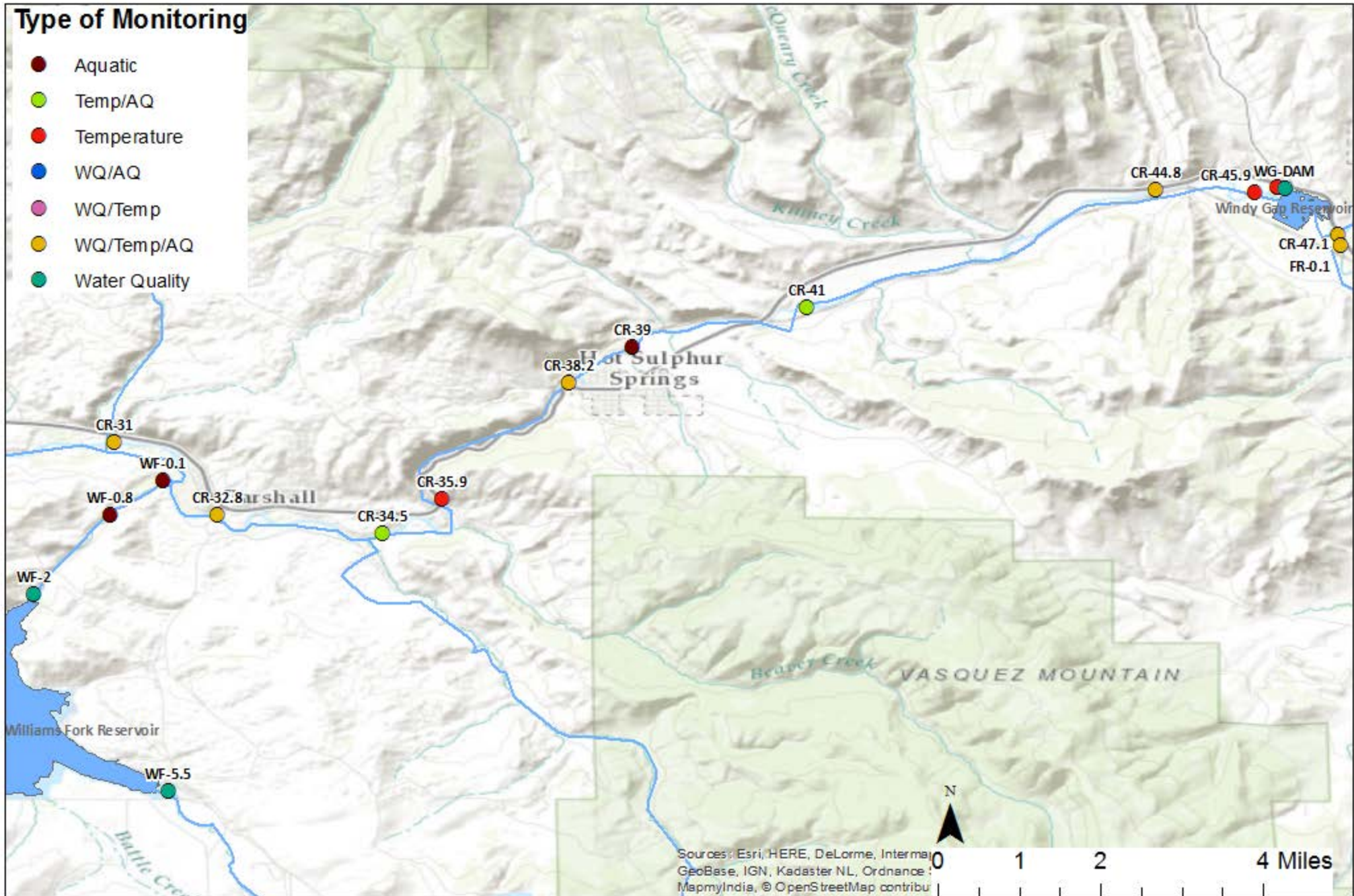
*ICPMS Total/Dis Suite - Be, B, Na, Mg, Al, Si, K, Ca, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Mo, Ag, Cd, Sb, Ba, Hg, Tl, Pb, U

DW - Denver Water

GW - GCWIN

AQ- Aquatic Life (bugs/fish)

Colorado River Williams Fork to Windy Gap



Colorado River -Williams Fork to Windy Gap

River Mile ID	Entity Station ID	River Mile	Description	Entity	Type	Location
CR-32.8	COR-CR3	32.8	Colorado R at County Rd 3	GCWIN	Temperature	Colorado River
CR-32.8	CR-WFU	32.8	Colorado River upstream of Williams Fork	Northern	Macroinvertebrate	Colorado River
CR-32.8	WS-CO-003	32.8	Colorado River north of Parshall at Bar Lazy J Ranch bridge	Denver Water	Water Quality	Colorado River
CR-34.5	COR-LoneBuck	34.5	Colorado R at Lone Buck	GCWIN	Temperature	Colorado River
CR-34.5		34.5	Gilbert-Lone Buck	CPW	Fish	Colorado River
CR-35.9	COR-blwByers	35.9	Colorado R blw Byers Canyon	GCWIN	Temperature	Colorado River
CR-38.2	COR-abvHSR	38.2	Colorado R above Hot Sulfur Resort	GCWIN	Temperature	Colorado River
CR-38.2	COR-abvHSR	38.2	Colorado R above Hot Sulfur Resort	GCWIN	Macroinvertebrate	Colorado River
CR-38.2	COR-abvHSR	38.2	Colorado R above Hot Sulfur Resort	GCWIN	Water Quality	Colorado River
CR-39	CR-HSU	39	Colorado River at Pioneer Park upstream of Hot Sulfur Springs	Northern	Macroinvertebrate	Colorado River
CR-41		41	Chimney Rock Ranch	CPW	Fish	Colorado River
CR-41	COR-SHRF	41	Colorado R at Sheriff Ranch	GCWIN	Temperature	Colorado River
CR-44.8	COR-blwWG	44.8	Colorado R blw Windy Gap at Hitching Post	GCWIN	Temperature	Colorado River
CR-44.8	COR-blwWG	44.8	Colorado R blw Windy Gap at Hitching Post	GCWIN	Macroinvertebrate	Colorado River
CR-44.8	COR-blwWG	44.8	Colorado R blw Windy Gap at Hitching Post	GCWIN	Water Quality	Colorado River
CR-44.8	CR-WGD	44.8	Colorado River downstream of Windy Gap	Northern	Temperature	Colorado River
CR-44.8	CR-WGD	44.8	Colorado River downstream of Windy Gap	Northern	Water Quality	Colorado River
CR-44.8	CR-WGD	44.8	Colorado River downstream of Windy Gap Reservoir	Northern	Macroinvertebrate	Colorado River
CR-45.9	CR-WGC	45.9	Colorado River at confluence of Windy Gap spillway and bypass	Northern	Temperature	Colorado River
CR-46.1	CR-WGB	46.1	Colorado River at Windy Gap Bypass	Northern	Temperature	Colorado River
WG-DAM	WG-DAM		Windy Gap Reservoir at Dam	Northern	Water Quality	Windy Gap Reservoir

Colorado River -Williams Fork to Windy Gap

General Field Parameters	Rivers and Streams						Windy Gap Reservoir	
	NW1	NW2	DW1	GW1	AQ1	AQ2	NW8	NW9
Temperature	X	X	X	X			X	X
Dissolved Oxygen	X	X	X	X			X	X
Specific Conductance	X	X	X	X			X	X
pH	X	X	X	X			X	X
Turbidity	X	X	X	X			X	X
Flow	X	X	X	X				
secchi depth							X	X

Major Ions (plus carbon and misc)

Calcium	X			X			X	
Magnesium	X			X			X	
Potassium	X						X	
Sodium	X			X			X	
Chloride	X			X			X	
Sulfate	X			X			X	
Total Organic Carbon	X	X					X	X
Total Alkalinity	X		X	X			X	
Total Suspended Solids	X	X	X	X			X	X
Total Dissolved Solids								

Metals

ICPMS Total/Dis Suite*	X		X				X	
Iron, total	X			X				
Aluminum, total				X				
Arsenic, total	X			X			X	
Chromium, total	X						X	
Manganese, total				X				
Aluminum, Dis				X				
Copper, dis	X			X			X	X
Iron, dis	X			X			X	X
Manganese, dis	X			X			X	X
Arsenic, dis	X			X			X	
Boron, dis	X						X	
Cadmium, dis	X			X			X	
Chromium, dis	X						X	
Lead, dis	X			X			X	
Nickel, dis	X						X	
Selenium, dis	X			X			X	
Silver, dis	X						X	
Uranium, dis	X						X	
Zinc, dis	X			X			X	

Nutrients

TKN	X	X					X	X
NH3 as N	X	X		X			X	X
NO3+NO2	X	X		X			X	X
Ortho P	X	X					X	X
P Total	X	X	X	X			X	X
chlorophyll a							X	X

Aquatic Habitat

Phytoplankton								
Zooplankton								
Macroinvertebrates					X			
Fish						X		

*ICPMS Total/Dis Suite - Be, B, Na, Mg, Al, Si, K, Ca, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Mo, Ag, Cd, Sb, Ba, Hg, Tl, Pb, U

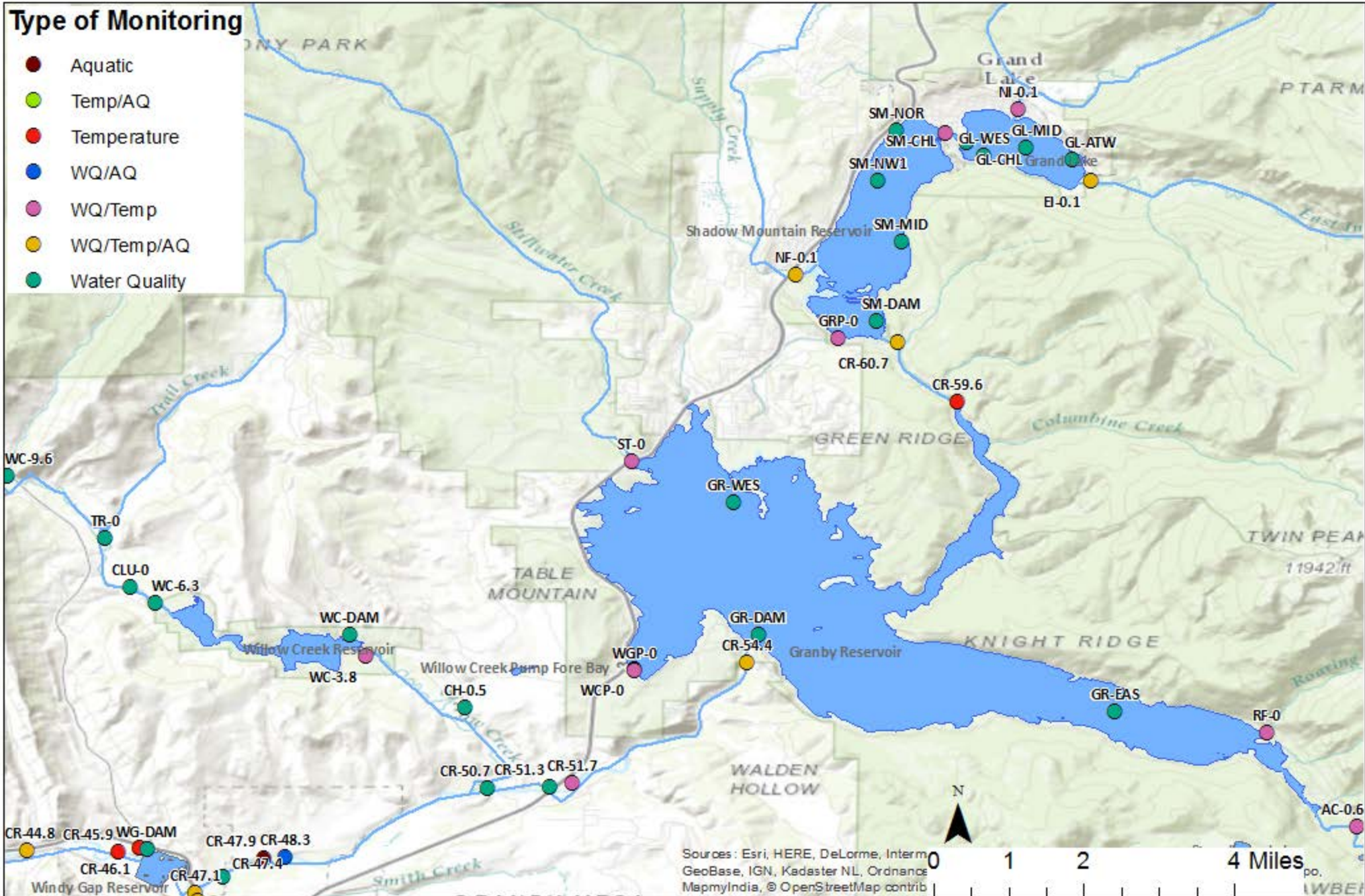
NW - Northern Water

DW - Denver Water

GW - GCWIN

AQ- Aquatic Life (bugs/fish)

Colorado River Windy Gap to Headwaters



Colorado River - Upstream of Windy Gap to Headwaters

River Mile ID	Entity Station ID	River Mile	Description	Entity	Type	Location
AC-0.6	AC-GRU	0.6	Arapaho Creek at Monarch Lake outlet, upstream of Lake Granby	Northern	Water Quality	Arapaho Creek
AC-0.6	AC-GRU	0.6	Arapaho Creek above Lake Granby	Northern	Temperature	Arapaho Creek
CH-0.5	CH-WCU	0.5	Church Creek upstream of Willow Creek at Flume	Northern	Water Quality	Church Creek
CLU-0	CLU1-WCU	0	Surface drainage channel on C Lazy U pasture that drains to Willow Creek	Northern	Water Quality	Willow Creek
CR-47.1	CR-WGU	47.1	Colorado River upstream of Windy Gap	Northern	Temperature	Colorado River
CR-47.1	CR-WGU	47.1	Colorado River above Windy Gap, upstream of confluence with Fraser River	Northern	Water Quality	Colorado River
CR-47.1	CR-WGU	47.1	Colorado River upstream of Windy Gap and Fraser River confluence	Northern	Macroinvertebrate	Colorado River
CR-47.4	CR-GPD	47.4	Colorado River downstream of Gravel Pit	Northern	Water Quality	Colorado River
CR-47.9		47.9	Shorefox Lower	CPW	Fish	Colorado River
CR-48.2	CR-GPU	48.2	Colorado River upstream of Gravel Pit	Northern	Water Quality	Colorado River
CR-48.3		48.3	Shorefox Upper	CPW	Fish	Colorado River
CR-50.7	CR-WCD	50.7	Colorado River downstream of Willow Creek	Northern	Water Quality	Colorado River
CR-51.3	CR-WCU	51.3	Colorado River upstream of Willow Creek	Northern	Water Quality	Colorado River
CR-51.7	CR-YGAGE	51.7	Colorado River downstream of Lake Granby at flow gage	Northern	Temperature	Colorado River
CR-51.7	CR-YGAGE	51.7	Colorado River downstream of Lake Granby at flow gage	Northern	Water Quality	Colorado River
CR-54.4	CR-GRD	54.4	Colorado River downstream of Lake Granby	Northern	Water Quality	Colorado River
CR-54.4	CR-GRD	54.4	Colorado River downstream of Lake Granby	Northern	Temperature	Colorado River
CR-54.4	CR-GRD	54.4	Colorado River downstream of Lake Granby	Northern	Macroinvertebrate	Colorado River
CR-59.6	CR-GRU	59.6	Colorado River upstream of Lake Granby	Northern	Temperature	Colorado River
CR-60.7	CR-SMD	60.7	Colorado River downstream of Shadow Mountain Reservoir	Northern	Water Quality	Colorado River
CR-60.7	CR-SMD	60.7	Colorado River downstream of Shadow Mountain Reservoir	Northern	Temperature	Colorado River
CR-60.7	CR-SMD	60.7	Colorado River downstream of Shadow Mountain Reservoir	Northern	Macroinvertebrate	Colorado River
EI-0.1	EI-GLU	0.1	East Inlet upstream of Grand Lake	Northern	Water Quality	East Inlet
EI-0.1	EI-GLU	0.1	East Inlet upstream of Grand Lake	Northern	Temperature	East Inlet
EI-0.1	EI-GLU	0.1	East Inlet upstream of Grand Lake	Northern	Macroinvertebrate	East Inlet
GL-ATW	GL-ATW		Grand Lake West Portal	Northern	Water Quality	Grand Lake
GL-MID	GL-MID		Grand Lake Mid-Section	Northern	Water Quality	Grand Lake
GL-WES	GL-WES		Grand Lake west end of lake, south of Shadow Mountain Channel	Northern	Water Quality	Grand Lake
GR-DAM	GR-DAM		Lake Granby Dam	Northern	Water Quality	Lake Granby
GR-EAS	GR-EAS		Lake Granby East Side	Northern	Water Quality	Lake Granby
GRP-0	GR-Pump	0	Granby Pump Canal at foot bridge on south side of Shadow Mountain	Northern	Water Quality	Granby Pump Canal
GRP-0	GR-PUMP	0	Granby Pump Canal above Shadow Mountain Reservoir	Northern	Temperature	Granby Pump Canal Canal
GR-WES	GR-WES		Lake Granby West Side	Northern	Water Quality	Lake Granby
NF-0.1	CR-SMU	0.1	North Fork of Colorado River upstream of Shadow Mountain Reservoir	Northern	Water Quality	North Fork of Colorado
NF-0.1	CR-SMU	0.1	North Fork of the Colorado River above Shadow Mountain Reservoir	Northern	Temperature	North Fork of Colorado
NF-0.1	CR-SMU	0.1	North Fork of Colorado River upstream of Shadow Mountain Reservoir	Northern	Macroinvertebrate	North Fork of Colorado

Colorado River - Upstream of Windy Gap to Headwaters

River Mile ID	Entity Station ID	River Mile	Description	Entity	Type	Location
NI-0.1	NI-GLU	0.1	North Inlet upstream of Grand Lake	Northern	Water Quality	North Inlet
NI-0.1	NI-GLU	0.1	North Inlet above Grand Lake	Northern	Temperature	North Inlet
RF-0	RF-GRU	0	Roaring Fork inlet upstream of Lake Granby	Northern	Water Quality	Roaring Fork
RF-0	RF-GRU	0	Roaring Fork above Lake Granby	Northern	Temperature	Roaring Fork
SM-CHL	SM-CHL		Shadow Mountain Reservoir Channel in Grand Lake at mouth of Channel	Northern	Water Quality	Grand Lake
SM-CHL	09014050		Grand Lake Outlet Blw Chipmunk Ln At Grand Lk, Co	GC/USGS	Temperature	Grand Lake
SM-CHL	09014050		Grand Lake Outlet Blw Chipmunk Ln At Grand Lk, Co	GC/USGS	Water Quality	Grand Lake
SM-DAM	SM-DAM		Shadow Mountain Reservoir Dam	Northern	Water Quality	Shadow Mountain
SM-MID	SM-MID		Shadow Mountain Reservoir Mid-Section	Northern	Water Quality	Shadow Mountain
SM-NOR	SM-NOR		Shadow Mountain Reservoir North	Northern	Water Quality	Shadow Mountain
SM-NW1	SM-NW1		Shadow Mountain Reservoir northwest of the center of the Reservoir	Northern	Water Quality	Shadow Mountain
ST-0	ST-GRU	0	Stillwater Creek upstream of Lake Granby	Northern	Water Quality	Stillwater Creek
ST-0	ST-GRU	0	Stillwater Creek above Lake Granby	Northern	Temperature	Stillwater Creek
TR-0	TRB-WCU	0	Tributary to Willow Creek upstream of C Lazy U Ranch (Trail Creek)	Northern	Water Quality	Trail Creek
WC-3.8	WC-WCRD	3.8	Willow Creek directly downstream of Willow Creek Reservoir Dam	Northern	Water Quality	Willow Creek
WC-3.8	WC-WCRD	3.8	Willow Creek downstream of Willow Creek Reservoir	Northern	Temperature	Willow Creek
WC-6.3	WC-WCRU	6.3	Willow Creek at USGS Gage above C-Lazy-U Ranch	Northern	Water Quality	Willow Creek
WC-9.6	WC-IRU	9.6	Willow Creek upstream of C-Lazy U Irrigated Areas	Northern	Water Quality	Willow Creek
WC-DAM	WC-DAM		Willow Creek Reservoir at Dam	Northern	Water Quality	Willow Creek Reservoir
WCP-0	WC-Pump	0	Willow Creek discharge chute to Lake Granby	Northern	Water Quality	Willow Creek Pump Canal
WCP-0	WC-PUMP	0	Willow Creek Pump Canal Inflow to Lake Granby	Northern	Temperature	Willow Creek Pump Canal
WGP-0	WG-Pump	0	Windy Gap discharge chute to Lake Granby	Northern	Water Quality	Windy Gap Pump Canal
WGP-0	WG-PUMP	0	Windy Gap Pump Inflow to Lake Granby	Northern	Temperature	Windy Gap Pump Canal

Colorado River - Upstream of Windy Gap to Headwaters

General Field Parameters	Rivers and Streams						Lakes and Reservoirs				
	NW1	NW2	NW3	NW4	NW5	AQ1	AQ2	NW6	NW7	NW8	NW9
Temperature	X	X	X	X	X			X	X	X	X
Dissolved Oxygen	X	X	X	X	X			X	X	X	X
Specific Conductance	X	X	X	X	X			X	X	X	X
pH	X	X	X	X	X			X	X	X	X
Turbidity	X	X	X	X	X			X	X	X	X
Flow	X	X	X	X	X						
secchi depth								X	X	X	X

Major Ions (plus carbon and misc)

Calcium	X							X		X	
Magnesium	X							X		X	
Potassium	X							X		X	
Sodium	X							X		X	
Chloride	X							X		X	
Sulfate	X							X		X	
Total Organic Carbon	X	X						X	X	X	X
Total Alkalinity	X							X		X	
Total Suspended Solids	X	X	X					X	X	X	X
Total Dissolved Solids											

Metals

Iron, total	X							X		X	
Arsenic, total	X							X		X	
Chromium, total	X							X		X	
Copper, dis	X							X	X	X	X
Iron, dis	X							X	X	X	X
Manganese, dis	X				X			X	X	X	X
Arsenic, dis	X							X		X	
Boron, dis	X							X		X	
Cadmium, dis	X							X		X	
Chromium, dis	X							X		X	
Lead, dis	X							X		X	
Nickel, dis	X							X		X	
Selenium, dis	X							X		X	
Silver, dis	X							X		X	
Uranium, dis	X							X		X	
Zinc, dis	X							X		X	

Nutrients

TKN	X	X	X	X	X			X	X	X	X
NH3 as N	X	X	X	X	X			X	X	X	X
NO3+NO2	X	X	X	X	X			X	X	X	X
Ortho P	X	X	X	X	X			X	X	X	X
P Total	X	X	X	X	X			X	X	X	X
chlorophyll a								X	X	X	X

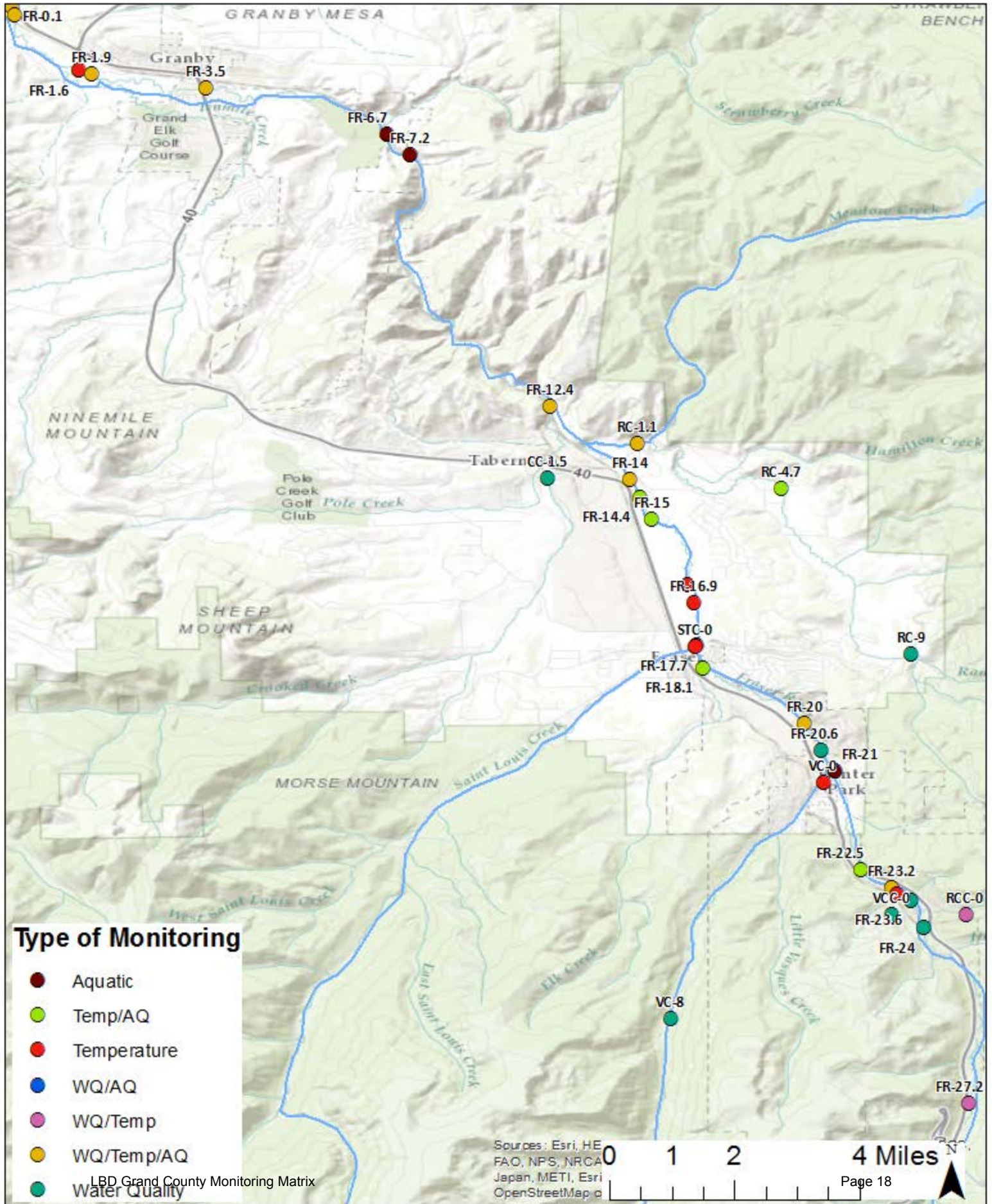
Aquatic Habitat

Phytoplankton								X	X		
Zooplankton								X	X		
Macroinvertebrates						X					
Fish							X				

NW - Northern Water

AQ- Aquatic Life (bugs/fish)

Fraser River - Colorado River Confluence to Winter Park



Fraser River - Colorado River to Winter Park

River Mile ID	Entity Station ID	River Mile	Description	Entity	Type	Location
CC-1.5	395927105505700	1.5	Crooked Cr Abv Pole Creek At Tabernash	EGWQB	Water Quality	Crooked Creek
FR-0.1	FR-WGU	0.1	Fraser River upstream of confluence with Colorado River	Northern	Water Quality	Fraser River
FR-0.1	FR-WGU	0.1	Fraser River upstream of confluence with Colorado River	Northern	Temperature	Fraser River
FR-0.1	FR-WGU	0.1	Fraser River upstream of confluence with Colorado River	Northern	Macroinvertebrate	Fraser River
FR-1.6	FR-blwGSD	1.6	Fraser R below Granby Sanitation	GCWIN	Temperature	Fraser River
FR-1.9	FR-abvGSD	1.9	Fraser R above Granby Sanitation	GCWIN	Temperature	Fraser River
FR-1.9	FR-abvGSD	1.9	Fraser R above Granby Sanitation	GCWIN	Macroinvertebrate	Fraser River
FR-1.9	FR-abvGSD	1.9	Fraser R above Granby Sanitation	GCWIN	Water Quality	Fraser River
FR-3.5	400453105554200	3.5	Fraser River At Hwy. 40 At Granby, Co	EGWQB	Water Quality	Fraser River
FR-3.5	FR-Hwy40Gr	3.5	Fraser R blw Highway 40 in Granby	GCWIN	Temperature	Fraser River
FR-3.5		3.5	Kaibab Park	CPW	Fish	Fraser River
FR-6.7		6.7	Granby Ranch	CPW	Fish	Fraser River
FR-7.2		7.2	Behler Creek	CPW	Fish	Fraser River
FR-12.4	09033300	12.4	Fraser River Blw Crooked Cr At Tabernash Co	EGWQB/CRWCD	Water Quality	Fraser River
FR-12.4	FR-abvFrCan	12.4	Fraser R above Fraser Canyon below Tabernash	GCWIN	Temperature	Fraser River
FR-12.4	FR-abvFrCan	12.4	Fraser R above Fraser Canyon below Tabernash	GCWIN	Macroinvertebrate	Fraser River
FR-14	09027100	14	Fraser River At Tabernash Co.	EGWQB	Water Quality	Fraser River
FR-14	09027100	14	Fraser River At Tabernash Co.	EGWQB/TU	Temperature	Fraser River
FR-14	FR-CR83	14	Fraser River at Tabernash below bridge on CR83	GCWIN	Macroinvertebrate	Fraser River
FR-14	FR-CR83	14	Fraser River at Tabernash below bridge on CR83	GCWIN	Water Quality	Fraser River
FR-14.4	FR-SpProjD	14.4	Fraser R LBD Restoration Project, Downstream end	GCWIN	Temperature	Fraser River
FR-14.4		14.4	Winter Park W & S	CPW	Fish	Fraser River
FR-15	FR-SpProjU	15	Fraser R LBD Restoration Project, Upstream end	GCWIN	Temperature	Fraser River
FR-15	FR-SpProjU	15	Fraser R LBD Restoration Project, Upstream end	GCWIN	Macroinvertebrate	Fraser River
FR-16.6	FR-blwFSD	16.6	Fraser R below Fraser Sanitation	GCWIN	Temperature	Fraser River
FR-16.9	FR-abvFSD	16.9	Fraser R above Fraser Sanitation	GCWIN	Temperature	Fraser River
FR-17.7	FR-blwCR8HD	17.7	Fraser R below County Rd 8 at Hammond Ditch	GCWIN	Temperature	Fraser River
FR-18.1	FR-CR804	18.1	Fraser R below County Rd 804	GCWIN	Temperature	Fraser River
FR-18.1		18.1	Safeway	CPW	Fish	Fraser River
FR-20	FR-Rendezvous	20	Fraser R at Rendezvous bridge	GCWIN	Temperature	Fraser River
FR-20	FR-Rendezvous	20	Fraser R at Rendezvous bridge	GCWIN	Macroinvertebrate	Fraser River
FR-20	FR-Rendezvous	20	Fraser R at Rendezvous bridge	GCWIN	Water Quality	Fraser River
FR-20.6	09025010	20.6	Fraser River Blw Vasquez Creek At Winter Park Co.	EGWQB	Water Quality	Fraser River

Fraser River - Colorado River to Winter Park

River Mile ID	Entity Station ID	River Mile	Description	Entity	Type	Location
FR-21		21	Confluence Park	CPW	Fish	Fraser River
FR-22.5	FR-blwWP	22.5	Fraser R below Winter Park Resort at Idlewild Campground	GCWIN	Temperature	Fraser River
FR-22.5		22.5	Idlewild Campground	CPW	Fish	Fraser River
FR-23.2	FR-blwWPSD	23.2	Fraser R below Winter Park Sanitation	GCWIN	Temperature	Fraser River
FR-23.4	FR-abvWPSD	23.2	Fraser R below Winter Park Sanitation	GCWIN	Macroinvertebrate	Fraser River
FR-23.4	FR-abvWPSD	23.2	Fraser R below Winter Park Sanitation	GCWIN	Water Quality	Fraser River
FR-23.4	FR-abvWPSD	23.4	Fraser R above Winter Park Sanitation	GCWIN	Temperature	Fraser River
FR-23.6	09023750	23.6	Fraser River Blw Buck Creek At Winter Park Co.	EGWQB	Water Quality	Fraser River
FR-24	09023560	24	Fraser River Above Moffat Tunnel Nr Winter Park, Co	EGWQB	Water Quality	Fraser River
FR-24	WS-FR-010	24	Fraser/Jim Canal at Gaging Station	Denver Water	Water Quality	Fraser River
FR-27.2	09022000	27.2	Fraser River At Upper Sta, Near Winter Park, Co.	EGWQB	Water Quality	Fraser River
FR-27.2	FR-Upper	27.2	Fraser R above Mary Jane entrance to Winter Park	GCWIN	Temperature	Fraser River
RC-1.1	09033100	1.1	Ranch Creek Blw Meadow Cr Nr Tabernash Co	EGWQB/CRWCD	Water Quality	Ranch Creek
RC-1.1	09033100	1.1	Ranch Creek Blw Meadow Cr Nr Tabernash Co	GC/DW	Temperature	Ranch Creek
RC-1.1	RC-blwMC	1.1	Ranch Creek below Meadow Creek	GCWIN	Temperature	Ranch Creek
RC-1.1	RC-blwMC	1.1	Ranch Creek below Meadow Creek	GCWIN	Macroinvertebrate	Ranch Creek
RC-4.7	RC-blwCR8315	4.7	Ranch Creek below County Rd 8315	GCWIN	Macroinvertebrate	Ranch Creek
RC-4.7	RC-blwCR8315	4.7	Ranch Creek below County Rd 8315	GCWIN	Temperature	Ranch Creek
RC-9	09032000	9	Ranch Creek Near Fraser, Co.	EGWQB	Water Quality	Ranch Creek
RCC-0	WS-FR-011	0	Ranch Canal at Gaging Station	Denver Water	Water Quality	Ranch Canal
STC-0	ST-LC	0	St. Louis Creek above confluence with Fraser R	GCWIN	Temperature	St Louis Creek
VC-0	VC-WP	0	Vasquez Creek at the town of Winter Park	GCWIN	Temperature	Vasquez Creek
VC-4.3	WS-FR-001	4.3	Vasquez Ck. above Vasquez Tunnel	Denver Water	Water Quality	Vasquez Creek
VC-8	WS-FR-002	8	Vasquez Ck. at diversion structure	Denver Water	Water Quality	Vasquez Creek
VCC-0	WS-FR-009	0	Vasquez Canal at Vasquez #1 Gaging Station	Denver Water	Water Quality	Vasquez Canal
VT-0	WS-WF-019	0	Vasquez Tunnel outlet	Denver Water	Water Quality	Vasquez Canal

Fraser River - Colorado River to Winter Park

General Field Parameters	NW1	NW2	DW1	GW1	GW2	EG1	EG2	EG3	EG4	EG5	EG6	AQ1	AQ2
Temperature	X	X	X	X	X	X	X	X	X	X	X		
Dissolved Oxygen	X	X	X	X	X	X	X	X	X	X	X		
Specific Conductance	X	X	X	X	X	X	X	X	X	X	X		
pH	X	X	X	X	X	X	X	X	X	X	X		
Turbidity	X	X	X	X	X	X	X	X	X	X	X		
Flow	X	X	X	X	X	X	X	X	X	X	X		

Major Ions (plus carbon and misc)

Calcium	X			X	X			X	X	X	X		
Magnesium	X			X	X			X	X	X	X		
Potassium	X												
Sodium	X			X									
Chloride	X			X		X	X	X	X	X	X		
Sulfate	X			X									
Total Organic Carbon	X	X											
Total Alkalinity	X		X	X									
Total Suspended Solids	X	X	X	X						X	X		
Total Dissolved Solids										X	X		
Cyanide										X	X		
Ecoli					X								

Metals

ICPMS Total/Dis Suite*			X										
Iron, total	X			X	X					X	X		
Aluminum, total				X	X								
Arsenic, total	X			X						X	X		
Boron, total										X	X		
Chromium, total	X									X	X		
Manganese, total				X									
Aluminum, dis				X	X								
Copper, dis	X			X	X		X	X	X	X	X		
Iron, dis	X			X	X		X	X	X	X	X		
Manganese, dis	X			X						X	X		
Arsenic, dis	X			X									
Boron, dis	X												
Cadmium, dis	X			X						X	X		
Chromium, dis	X												
Lead, dis	X			X	X		X	X	X	X	X		
Nickel, dis	X									X	X		
Selenium, dis	X			X						X	X		
Silver, dis	X									X	X		
Uranium, dis	X									X	X		
Zinc, dis	X			X			X	X	X	X	X		
Mercury, dis						X		X	X	X	X		

Nutrients

TKN	X	X				X	X	X	X	X			
NH3 as N	X	X		X	X	X	X	X	X	X			
NO3					X								
NO3+NO2	X	X		X		X	X	X	X	X			
Ortho P	X	X				X	X	X	X	X			
P Total	X	X	X	X	X	X	X	X	X	X			

Aquatic Habitat

Macroinvertebrates												X	
Fish													X

*ICPMS Total/Dis Suite - Be, B, Na, Mg, Al, Si, K, Ca, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Mo, Ag, Cd, Sb, Ba, Hg, Tl, Pb, U

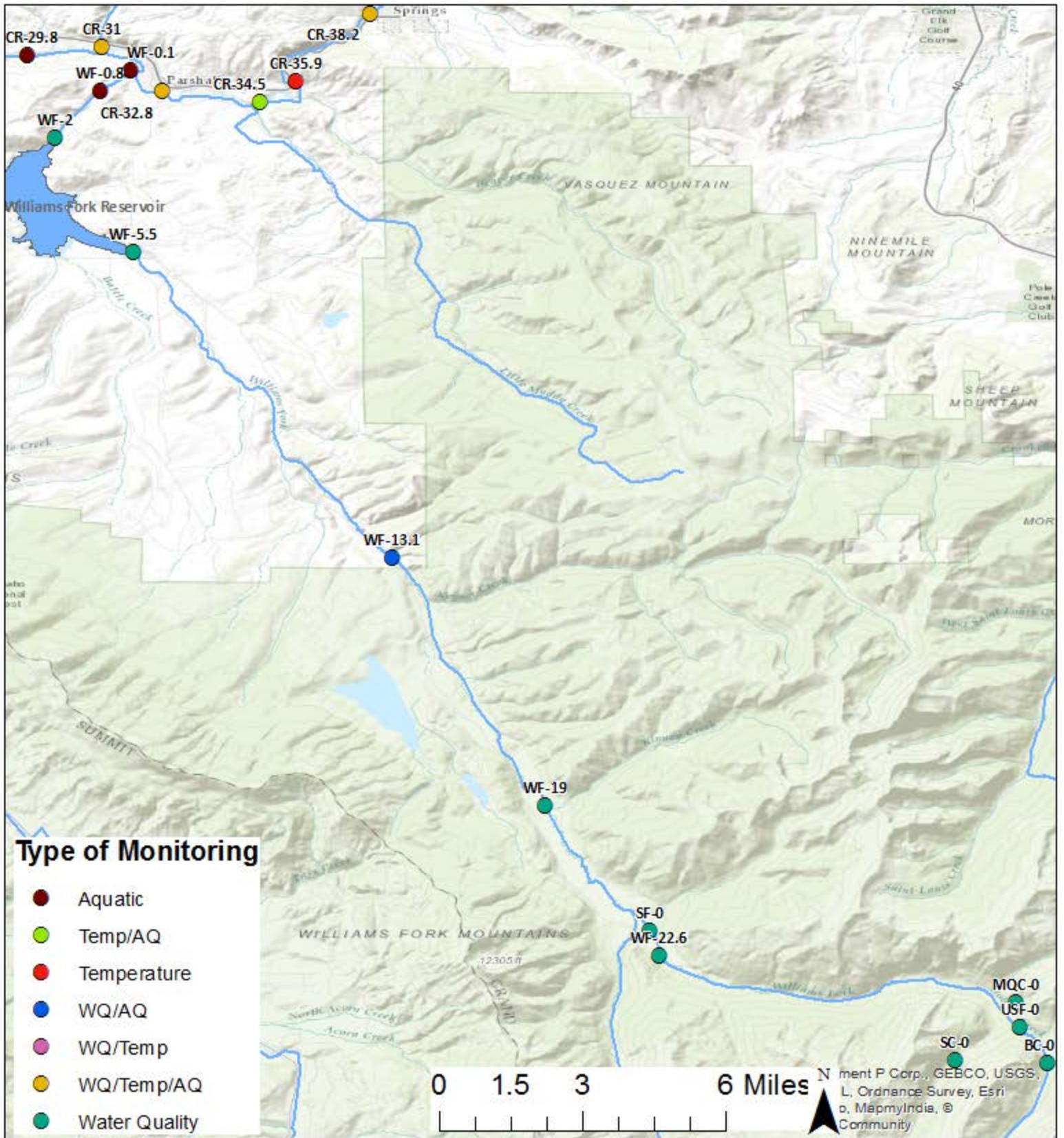
DW - Denver Water

GW - GCWIN

AQ- Aquatic Life (bugs/fish)

EG - East Grand Water Quality Board

Williams Fork



Williams Fork

River Mile ID	Entity Station ID	River Mile	Description	Entity	Type	Location
BC-0	WS-WF-008	0	Bobtail Creek above diversion dam downstream of gauging station (south of dorm)	Denver Water	Water Quality	Bobtail Creek
MQC-0	WS-WF-006	0	McQueary Creek above diversion dam 1 3/4 miles north of dorm	Denver Water	Water Quality	McQuery Creek
SC-0	WS-WF-005	0	Steelman Creek at bridge above diversion dam (south of dorm)	Denver Water	Water Quality	Steelman Creek
SF-0	WS-WF-003	0	South fork at South Fork Campground at gauging station	Denver Water	Water Quality	South Fork
USF-0	WS-WF-007	0	Upper South Fork of the Williams Fork (3.5 miles above trail head)	Denver Water	Water Quality	South Fork
WF-0.1		0.1	Fence Hole station	CPW	Fish	Williams Fork
WF-0.8		0.8	Diversion station	CPW	Fish	Williams Fork
WF-2	WS-WF-009	2	Williams Fork R. below Williams Fork Res.	Denver Water	Water Quality	Williams Fork
WF-5.5	WS-WF-001	5.5	Williams Fork River	Denver Water	Water Quality	Williams Fork
WF-13.1	KR-LS-11081	13.1	Williams Fork	BLM	Water Quality	Williams Fork
WF-13.1	KR-LS-11081	13.1	Williams Fork	BLM	Macroinvertebrate	Williams Fork
WF-13.1	KR-LS-11081	13.1	Williams Fork	BLM	Habitat	Williams Fork
WF-19	WS-WF-002	19	WilliamsForkRiver below Kinney Creek confluence at Leal gauge	Denver Water	Water Quality	Williams Fork
WF-22.6	WS-WF-004	22.6	Williams Fork above bridge at Sugarloaf Campground	Denver Water	Water Quality	Williams Fork

Williams Fork

General Field Parameters	DW1	BLM1	AQ1	AQ2
Temperature	X	X		
Dissolved Oxygen	X	X		
Specific Conductance	X	X		
pH	X	X		
Turbidity	X			
Flow	X			

Major Ions (plus carbon and misc)

Calcium				
Magnesium				
Potassium				
Sodium				
Chloride				
Sulfate				
Total Organic Carbon				
Total Alkalinity	X			
Total Suspended Solids	X			
Total Dissolved Solids				
Ecoli				

Metals

ICPMS Total/Dis Suite*	X			
------------------------	---	--	--	--

Nutrients

TKN		X		
NH3 as N		X		
NO3				
NO3+NO2		X		
Ortho P				
P Total	X	X		

Aquatic Habitat

Macroinvertebrates		X	X	
Fish				
Habitat (% fines,% pools, etc)		X		X

*ICPMS Total/Dis Suite - Be, B, Na, Mg, Al, Si, K, Ca, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Mo, Ag, Cd, Sb, Ba, Hg, Tl, Pb, U

DW - Denver Water

BLM - Bureau of Land Management

AQ- Aquatic Life (bugs/fish)

Williams Fork

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
BC-0					DW1				DW1			
MQC-0					DW1				DW1			
SC-0					DW1				DW1			
SF-0					DW1				DW1			
USF-0					DW1				DW1			
WF-0.1									AQ2			
WF-0.8									AQ2			
WF-2	DW1		DW1	DW1	DW1	DW1	DW1		DW1		DW1	
WF-5.5	DW1		DW1	DW1	DW1	DW1	DW1		DW1		DW1	
WF-13.1				BLM1								
WF-19					DW1				DW1			
WF-22.6					DW1				DW1			

River Name	Abbreviation
Bobtail Creek	BC
McQuery Creek	MQC
South Fork	SF
Steelman Creek	SC
Williams Fork	WF