

List and Source of Surface Water Records

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For the surface water operations model, inputs and calibration data sets made use of numerous data sources, as documented below. Links to the data are available via the [COHYST Website](#).

Mainstem gages

Gages used to obtain daily flow data are listed below.

Gage Number	Gage Description	Source	System
6764000	South Platte River at Julesburg, Colorado	USGS	South Platte River
6764880	South Platte River at Roscoe, Nebraska	USGS	South Platte River
6765000	South Platte River at Paxton, Nebraska	USGS	South Platte River
6765500	South Platte River at North Platte, Nebraska	USGS	South Platte River
6687500	North Platte River at Lewellen, Nebraska	USGS	North Platte River
6690500	North Platte River near Keystone, Nebraska	USGS	North Platte River
6691000	North Platte River near Sutherland, Nebraska	USGS	North Platte River
6693000	North Platte River at North Platte, Nebraska	USGS	North Platte River
229000	Platte River below Tri-County Diversion Dam	NDNR	Plate River
6766000	Platte River at Brady, Nebraska	USGS	Plate River
6766500	Platte River near Cozad, Nebraska	USGS	Plate River
6768000	Platte River near Overton, Nebraska	USGS	Plate River
6770000	Platte River near Odessa, Nebraska	USGS	Plate River
6770200	Platte River near Kearney, Nebraska	USGS	Plate River
6770500	Platte River near Grand Island, Nebraska	USGS	Plate River
6774000	Platte River near Duncan, Nebraska	USGS	Plate River

Tributary gages

Gages used to obtain daily flow data are listed below.

Gage Number	Gage Description	Source	System
6692000	Birdwood Creek near Hershey, Nebraska	USGS	North Platte River
216000	Fremont Slough (FREMONT SLOUGH INTO SUTHERLAND POWER RETURN AT NORTH PLATTE)	NDNR	North Platte River
6768020	Spring Creek near Overton, Nebraska	USGS	Platte River
203000	Buffalo Creek near Elm Creek	NDNR	Platte River
215000 (USGS) 6769525 (NDNR)	Elm Creek near Elm Creek	USGS/NDNR	Platte River
6767500	Plum Creek near Smithfield	USGS/NDNR	Platte River
6770195	North Dry Creek, 2 miles southwest of bridge southwest of Kearney	USGS	Platte River
6770175	Whisky Slough, 1 mile east of Phelps-Kearney County line	USGS	Platte River
6772000	Wood River near Alda, Nebraska	USGS/NDNR	Platte River
6772775	Warm Slough near Central City, Nebraska	USGS	Platte River
6772898	Silver Creek at Mi 4 near Silver Creek, Nebraska	USGS	Platte River
6773500	Prairie Creek near Silver Creek, Nebraska	USGS	Platte River
6769000	Buffalo Creek near Overton (Nebraska DNR/USGS station)	USGS/NDNR	Platte River

Canal infrastructure locations and diversion capacity

Spatial layouts of the surface water canal system were derived from NDNR hydrographic datasets. The layouts for the North Platte Canals (Keith-Lincoln, Paxton-Hershey, North Platte, Suburban, and Cody-Dillon) were supplemented with ground-truthed data provided by TPNRD. System layouts are available in ArcGIS shapefile format and can be founded on the data link FTP site.

Estimates of the physical capacities of the irrigation canal diversions and subsequent canal reaches were provided by NDNR, NPPD, and CNPPID and are summarized below.

Canal Reaches and Capacities

Canal Reach	Capacity [cfs]
North Platte	
Keystone Diversion, from headgate below Lake McConaughy to South Platte River crossing	1750
Keystone Diversion, from South Platte River to junction with Korty Diversion/Sutherland Canal	1750
Keith Lincoln Diversion, from headgate to South Platte River return	100
North Platte Diversion Canal, from headgate to junction with Cody Dillon Diversion	350
North Platte Diversion Canal, from junction with Cody Dillon Diversion to North Platte River return	
Paxton Hershey Diversion, from headgate to North Platte River return	135
Suburban Canal Diversion, from headgate to South Platte River return	105
Cody Dillon Diversion, from headgate to junction with North Platte Diversion Canal	60
Birdwood Creek	
Birdwood Canal, from headgate to end	
South Platte River	
Future Diversion below Julesburg, from headgate to end	
Western Canal, from headgate to South Platte River return	250
Korty Diversion, from headgate to junction with Keystone Diversion/Sutherland Canal	850
Sutherland Canal, from Keystone/Korty junction to Sutherland Reservoir inflow	2000
Sutherland Canal, from Sutherland Reservoir outflow to Lake Maloney inflow	1900
Sutherland Canal, from Lake Maloney outflow to NP Hydro	1750
Sutherland Canal, from NP Hydro to South Platte River return	1750
Platte River (north side)	
Gothenburg Canal, from headgate to junction with Lake Helen inlet lateral	400
Lateral, from Gothenburg Canal to Lake Helen	
Gothenburg Canal, from Lake Helen inlet lateral to junction with Lateral 6	400
Lateral 6, from Gothenburg Canal to junction with Cozad Diversion	12
Gothenburg Canal, below Lateral 6	400
Gothenburg Canal, above Spring Creek	400
Gothenburg Canal, from Spring Creek to junction with B1 Reservoir inlet lateral	400
Lateral, from Gothenburg Canal to B1 Reservoir	20
Gothenburg Canal, from B1 Reservoir inlet lateral to Buffalo Creek	
Cozad Diversion, from headgate to junction with Lateral 6	290
Cozad Canal, from Lateral 6 to junction with Dawson County Diversion	
Dawson County Diversion, from headgate to junction with Cozad Canal	525
Dawson County Diversion, from Cozad Canal to Spring Creek	
Dawson Canal, from Spring Creek to Berquist Lateral	

Berquist Lateral, from Dawson Canal to Spring Creek return	
Dawson Canal, from Berquist Lateral to Lateral 2	
Lateral 2, from Dawson Canal to Buffalo Creek return	
Dawson Canal, from Lateral 2 to French Creek	
Dawson Canal, from French Creek to Elm Creek return	
Kearney Canal Diversion, from headgate to Turkey Creek	400
Kearney Canal, from Turkey Creek to Cottonmill Lake	
Kearney Canal, from Cottonmill Lake to Lake Kearney inflow	
Kearney Canal, from Lake Kearney outflow to Platte River return	
Platte River (south side)	
Supply Canal, headgate to Jeffrey Reservoir inflow	2250
Supply Canal, Jeffrey Hydro outflow to junction with Jeffrey Return	
Jeffrey Return, from Supply Canal to Platte River return	1200
Supply Canal, from Jeffrey Return to junction with Thirty Mile Siphon	
Thirty Mile Siphon, from Supply Canal to junction with Thirty Mile Canal	
Supply Canal, from Thirty Mile Siphon to E65 Diversion	
Supply Canal, from E65 Diversion to Johnson Lake inflow	
Supply Canal, from Johnson Lake outflow/E67 Diversion to J1 Hydro	
E67 Diversion, from Supply Canal to end	100
Supply Canal, from J1 Hydro to J2 Hydro	
Supply Canal, from J2 Hydro to Phelps County Diversion	
Supply Canal (J2 Return), from Phelps County Diversion to Platte River return	2000
Thirty Mile Diversion, from headgate to junction with Thirty Mile Siphon	325
Thirty Mile Canal, from Thirty Mile Siphon to Thirty Mile Midway Lakes inflow	
Thirty Mile Midway Lakes, inflow to outflow	
Thirty Mile Return, from Thirty Mile Midway Lakes outflow to Platte River return	
Six Mile Canal, from headgate to Platte River return	25
Orchard Alfalfa Canal, from headgate to Platte River return	85

Diversion data other than Tri-County system

Daily diversion data for the irrigation canals were obtained from NDNR records for gaging stations listed below. With the exception of the Kearney Canal, none of the irrigation canal returns are gaged.

Gages used to obtain diversion data are listed below.

Gage Number	Canal Gage Description	Source	System
76000	Keith-Lincoln Canal	NDNR	North Platte River
121000	Paxton-Hershey Canal	NDNR	North Platte River
114000	North Platte Canal	NDNR	North Platte River
136000	Suburban Canal	NDNR	North Platte River
27000	Cody-Dillon Canal	NDNR	North Platte River
16000	Birdwood Canal	NDNR	North Platte River
147000	Western Canal	NDNR	South Platte River
57000	Gothenburg Canal	NDNR	Platte River
141000	Thirty-Mile Canal	NDNR	Platte River
134000	Six Mile Canal	NDNR	Platte River
33000	Cozad Canal	NDNR	Platte River
37000	Dawson County Canal	NDNR	Platte River
117000	Orchard Alfalfa Canal	NDNR	Platte River
73000	Kearney Canal from the Platte River	NDNR	Platte River
75000	Kearney Power Return to the Platte River	NDNR	Platte River

Infrastructure for Tri-County system

The Tri-County system includes the Tri-County diversion, the main supply canal, two regulating reservoirs (Jeffrey and Johnson Lakes), three hydropower facilities (Jeffrey, J-1, and J-2), three irrigation delivery canals (E-65, E-67, and Phelps canals), one irrigation storage reservoir (Elwood Reservoir) and two returns to the Platte River (Jeffrey and J-2 returns). Layouts of the Tri-County canal system were provided by CNPPID. System layouts are available in ArcGIS shapefile format and can be founded on the data link FTP site.

Estimates of the physical capacities of the supply and irrigation canal diversions, subsequent canal reaches, hydropower facilities, and returns were provided by CNPPID. Main Canal data are summarized in the capacities table above and more specific E-65 – Phelps Canal capacity data are shown in the table below.

Location	Flow/CFS	Depth	Width	Length/Miles	Area/Sq.Ft.	Ac. Ft.
E65 Diversion, from headgate to junction with Elwood Reservoir inlet/outlet	365	6.50	10.00	5.90	149.50	106.92
E65 to and from Elwood Reservoir	310	9.00	10.00	0.28	252.00	8.55
E65, from Elwood Reservoir inlet/outlet to junction with E65 Lateral 19.1	675	11.40	23.00	11.48	522.12	726.54
E65 Lateral 19.1, from E65 to end	91	6.60	4.00	5.70	113.52	78.43
E65, from E65 lateral 19.1 to junction with E65 Lateral 19.3	552	8.85	18.00	0.20	315.95	7.66
E65 Lateral 19.3, from E65 to end	22	2.75	1.00	4.52	17.88	9.79
E65, from E65 lateral 19.3 to junction with E65 lateral 23.7	502	7.68	19.00	4.40	263.88	140.00
E65 Main, from E65 Lateral 23.7 to end	174	5.00	5.00	12.50	75.00	113.64
E65 lateral 23.7, from E65 Main to junction with E65 lateral 23.7 lateral 1.7	361	9.50	7.00	1.70	247.00	50.90
E65 lateral 23.7 lateral 1.7, from E65 lateral 23.7 to end	48	2.86	2.00	3.50	22.08	9.37
E65 lateral 23.7, from lateral 1.7 to Phelps Canal return	300	6.09	4.00	16.80	98.54	200.66
Phelps County Diversion, from Supply Canal (J-2 Return) to Lateral A18.7	1314	10.82	45.00	18.70	721.04	1634.37
Lateral A18.7, from Phelps	96	5.00	8.00	11.40	90.00	124.36

Canal to end						
Phelps Canal, from Lateral A18.7 to Lateral A21.5	1194	10.70	35.00	2.80	603.48	204.82
Lateral A21.5, from Phelps Canal to end	55	3.30	7.00	5.20	44.88	28.29
Phelps Canal, from Lateral A21.5 to junction with E65 Lateral 23.7	1033	9.90	35.00	1.20	542.52	78.91
Phelps Canal, from junction with E65 Lateral 23.7 to Lateral A24.4	1033	9.90	35.00	2.10	542.52	138.10
Lateral A24.4, from Phelps Canal to end	82	4.00	7.00	10.80	60.00	78.55
Phelps Canal, from Lateral A24.4 to Lateral A29.1	826	8.76	35.00	4.70	460.08	262.10
Lateral A29.1, from Phelps Canal to Funk Lagoon	220	5.00	12.00	46.00	110.00	613.33
Phelps Canal, from Lateral A29.1 to Lateral A29.8	612	8.76	30.00	0.70	416.28	35.32
Lateral A29.8, from Phelps Canal to Funk Lagoon	Pipeline					
Phelps Canal, from A29.8 to Lateral A33.5	612	7.60	25.00	4.40	305.52	162.94
Lateral A33.5, from Phelps Canal to Funk Lagoon	68	3.50	8.00	12.20	52.50	77.63
Phelps Canal, from A33.5 to Lateral A38.6	538	7.07	20.00	5.10	241.37	149.21
Lateral A38.6, from Phelps Canal to Lateral A38.6-0.6	288	7.20	14.00	0.60	204.48	14.87
Lateral A38.6-0.6, from Lateral A38.6 to end	120	3.70	9.00	13.20	60.68	97.09
Lateral A38.6, from Lateral A38.6-0.6 to Phelps Canal Return	168	4.10	10.00	10.20	72.00	89.02
Phelps Canal, from Lateral A38.6 to Lateral A38.6 return	257	5.70	8.00	7.90	110.58	105.89
Phelps Canal, from Lateral A38.6 return to Lateral A49.2	151	4.00	8.00	2.70	64.00	20.94
Lateral A49.2, from Phelps Canal to Phelps Canal return	25	2.00	2.00	5.10	12.00	7.42
Phelps Canal, from Lateral A49.2 to Lateral A49.2 return	151	4.00	8.00	4.50	64.00	34.91
Phelps Canal, from Lateral A49.2 return to Adams Canal	151	4.00	8.00	3.00	64.00	23.27

Diversion and return data for Tri-County system

Gages used to obtain diversion data are listed below; two returns are gaged.

Gage Number	Canal Gage Description	Source
142000	Tri-County Canal (CNPPID Supply Canal)	NDNR
	Jeffrey Lake Discharge	CNPPID
143000	Jeffrey Lake Power Return to Platte River	NDNR
	J1 Hydropower Facility Discharge	CNPPID
	J2 Hydropower Facility Discharge	CNPPID
144000	Johnson (J2) Return Canal to Platte River	NDNR
	E65 Diversion @ headgate(total diversion into E65 canal for irrigation and Elwood)	CNPPID
	E67 Diversion	CNPPID
	Phelps Canal Diversion	CNPPID

Infrastructure for the Sutherland system

The NPPD Sutherland system includes two diversions (Korty Diversion from the South Platte River, Keystone Diversion from the North Platte River), main supply canal, Sutherland Reservoir which serves as a cooling water source for the Gerald Gentleman Station, one regulating reservoir (Lake Maloney), the North Platte hydropower facility, and the Sutherland return to the South Platte River near North Platte. Layouts of the Sutherland system were provided by NPPD. System layouts are available in ArcGIS shapefile format and can be founded on the data link FTP site.

Estimates of the physical capacities of the supply and irrigation canal diversions, subsequent canal reaches, hydropower facilities, and returns were provided by NPPD. Key data are summarized above in the capacities table.

Diversion and return data for Sutherland system

Gages used to obtain diversion and outflow or return data are listed below.

Gage Number	Canal Gage Description	Source
138000	Keystone diversion from North Platte River	NDNR
6764900	Korty diversion from South Platte River	USGS
	Sutherland Reservoir Inflow	NPPD
	Sutherland Reservoir Outflow	NPPD
	Lake Maloney Inflow	NPPD
140000	Sutherland return to North Platte River	NDNR

Reservoir data

Daily data for the reservoirs included in the STELLA surface water operations model were provided by NPPD and CNPPID gaging records, from the locations listed below.

Description	Source	System
Lake McConaughy Elevation	CNPPID	North Platte River
Lake McConaughy Releases	CNPPID	North Platte River
Sutherland Reservoir Elevation	NPPD	South Platte River
Lake Maloney Elevation	NPPD	South Platte River
Jeffrey Lake Elevation	CNPPID	Platte River
B1 Reservoir Inflow	CPNRD	Platte River via Gothenburg Canal
Elwood Reservoir Elevation	CNPPID	Platte River
Elwood Reservoir Inflow	CNPPID	Platte River
Elwood Reservoir Outflow	CNPPID	Platte River
Johnson Lake Elevation	CNPPID	Platte River