SUPPLEMENTAL INFORMATION

Table 4. Summary of ice data collected at selected sites in South Dakota, 1999-2001

[°C, degrees Celsius; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 degrees Celsius; sec, seconds; in/sec, inches per second; lb/in^2, pounds per square inch; >, greater than; --, no data or not applicable]

Date of ice-data collection	Air temperature (°C)	Daily mean discharge (ft^3/s)	Description of ice sample	Total distance across transect (feet)	Distance from shore (feet)	Ice thickness (feet)
			Site 1, James River at Huron			
02-06-99	0.0	222	Clear ice (columnar ice)	[1]250	40	1.1
			Clear ice (columnar ice)		80	1.1
			Clear ice (columnar ice)		80	--
			Clear ice (columnar ice)		120	1.1
			Clear ice (columnar ice)		120	--
			Clear ice (columnar ice)		160	1.3
			Clear ice (columnar ice)		160	--
			Clear ice (columnar ice)		160	--
			Clear ice (columnar ice)		200	1.3
			Clear ice (columnar ice)		200	--
			Clear ice (columnar ice)		230	1.3
			Clear ice (columnar ice)		230	--
01-20-00	-5.0	139	Cloudy ice (snow ice)	[1]241	50	.7
			Cloudy ice (snow ice)		100	.9
			Cloudy ice (snow ice)		150	1.0
			Cloudy ice (snow ice)		200	1.2
02-24-00	3.0	99	Cloudy ice (deteriorated columnar and snow ice); 0.40-inch rain fell on 02-23-00	[1]235	50	.7
			Cloudy ice (deteriorated columnar and snow ice); 0.40-inch rain fell on 02-23-00		50	--
			Cloudy ice (deteriorated columnar and snow ice); 0.40-inch rain fell on 02-23-00		122	.7
			Cloudy ice (deteriorated columnar and snow ice); 0.40-inch rain fell on 02-23-00		122	--
			Cloudy ice (deteriorated columnar and snow ice); 0.40-inch rain fell on 02-23-00		122	--
			Cloudy ice (deteriorated columnar and snow ice); 0.40-inch rain fell on 02-23-00		182	1.0
			Cloudy ice (deteriorated columnar and snow ice); 0.40-inch rain fell on 02-23-00		182	--
01-08-01	-4.0	[2]260	Top 3 inches cloudy ice (snow ice), then very clear ice (columnar ice)	[1]250	50	1.4
			Top 3 inches cloudy ice (snow ice), then very clear ice (columnar ice)		50	--
			Top 3 inches cloudy ice (snow ice), then very clear ice (columnar ice)		100	1.6
			Top 3 inches cloudy ice (snow ice), then very clear ice (columnar ice)		100	--

Snow depth (inches)	Depth of water (feet)	Specific conduc-tance (µS/cm)	Ice sample diameter by height (inches)	Where sample taken in column	Ice-crushing rate (in/sec)	Ice-crushing strength (lb/in^2)	Average ice-crushing strength at section (lb/in^2)	Average ice-crushing strength at site (rounded to nearest 25 lb/in^2)
0.0	7.8	--	4x8	Middle	0.0010	474	474	[2]400
.0	11.1	--	4x8	Middle	.0010	466	465	--
--	--	--	4x5	Middle	.0010	465	--	--
.0	9.3	--	4x8	Middle	.0010	455	437	--
--	--	--	4x5.5	Middle	.0010	418	--	--
.0	6.2	--	4x6.75	Middle	.0010	228	238	--
--	--	--	4x6.5	Middle	.0010	244	--	--
--	--	--	4x6.5	Middle	.0010	243	--	--
.0	4.5	--	4x8	Middle	.0010	381	336	--
--	--	--	3.5x7	Middle	.0006	290	--	--
.0	2.0	--	4x8.5	Middle	.0010	522	[2]500	--
--	--	--	3.5x7	Middle	.0010	>381	--	--
.5	12.0	--	4x7	Middle	.0010	875	875	[2]950
.0	10.8	--	4x7	Middle	.0010	>883	[2]900	--
.0	6.8	--	4x6	Middle	.0010	>1,042	[2]1,050	--
1.5	1.6	--	4x7	Middle	--	--	--	--
.0	10.7	--	3.5x6	Middle	.0010	258	288	[2]300
--	--	--	3.5x7	Middle	.0010	317	--	--
.0	9.4	--	3.5x7	Middle	.0013	>172	[2]175	--
--	--	--	3.5x7	Middle	.0010	>120	--	--
--	--	--	4x4.5	Middle	.0010	180	--	--
.0	4.7	--	3.5x6.25	Middle	.0013	>495	[2]450	--
--	--	--	3.5x6.5	Middle	.0010	380	--	--
.0	10.7	--	3.5x8	Upper	.0010	744	802	[2]800
--	--	--	3.5x8	Upper	.0010	859	--	--
.0	10.7	--	3.5x8	Upper	.0010	>1,046	[2]1,010	--
--	--	--	3.5x8	Upper	.0010	973	--	--

Table 4. Summary of ice data collected at selected sites in South Dakota, 1999-2001—Continued

[°C, degrees Celsius; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 degrees Celsius; sec, seconds; in/sec, inches per second; lb/in^2, pounds per square inch; >, greater than; --, no data or not applicable]

Date of ice-data collection	Air temperature (°C)	Daily mean discharge (ft^3/s)	Description of ice sample	Total distance across transect (feet)	Distance from shore (feet)	Ice thickness (feet)
			Site 1, James River at Huron—Continued			
01-08-01			Top 3 inches cloudy ice (snow ice), then very clear ice (columnar ice)		150	1.7
			Top 3 inches cloudy ice (snow ice), then very clear ice (columnar ice)		150	--
			Top 3 inches cloudy ice (snow ice), then very clear ice (columnar ice)		150	--
			Very clear ice (columnar ice)		200	1.8
			Very clear ice (columnar ice)		200	--
02-12-01	-8.3	[2]65	Semi-cloudy ice	[3]250	50	2.3
			Semi-cloudy ice		50	--
			Clear ice (columnar ice)		50	--
			Clear ice (columnar ice)		50	--
			Top 2 inches cloudy/milky ice (snow ice), then clear ice (columnar ice)		100	1.8
			Top 2 inches cloudy/milky ice (snow ice), then clear ice (columnar ice)		100	--
			Clear ice (columnar ice)		100	--
			Clear ice (columnar ice)		100	1.8
			Semi-cloudy ice; water on ice		150	--
			Semi-cloudy ice; water on ice		150	--
			4 inches of water on ice		200	--
04-02-01	3.0	[2]472	Top 3 inches slushy ice (deteriorated columnar and snow ice), then clear ice (columnar ice)	[1]250	70	1.8
			Top 3 inches slushy ice (deteriorated columnar and snow ice), then clear ice (columnar ice)		70	--
			Top 4 inches slushy ice (deteriorated columnar and snow ice), then clear ice (columnar ice)		130	1.8
			Top 4 inches slushy ice (deteriorated columnar and snow ice), then clear ice (columnar ice)		130	--
			Top 4 inches hard blueish/gray ice (columnar ice), then weak ice (deteriorated columnar ice)		205	2.2
			Top 4 inches hard blueish/gray ice (columnar ice), then weak ice (deteriorated columnar ice)		205	--
04-03-01	--	[2]771	Top 7 inches water/slush, then cloudy/slushy ice (deteriorated columnar and snow ice)	[1]250	50	--
			Top 7 inches water/slush, then cloudy/slushy ice (deteriorated columnar and snow ice)		50	--

Snow depth (inches)	Depth of water (feet)	Specific conduc-tance (µS/cm)	Ice sample diameter by height (inches)	Where sample taken in column	Ice-crushing rate (in/sec)	Ice-crushing strength (lb/in^2)	Average ice-crushing strength at section (lb/in^2)	Average ice-crushing strength at site (rounded to nearest 25 lb/in^2)
0.0	7.7	--	3.5x8	Upper	0.0011	838	789	--
--	--	--	3.5x7	Lower	.0010	661	--	--
--	5.2	--	3.5x7	Lower	.0010	869	--	--
.0	--	--	3.5x8	Upper	.0010	578	638	--
--	--	--	3.5x8	Upper	.0010	697	--	--
24.0	3.6	1,900	3.5x8	Upper	.0013	968	924	[2]850
--	--	--	3.5x8	Upper	.0013	988	--	--
--	--	--	3.5x7	Lower	.0013	744	--	--
--	--	--	3.5x8	Lower	.0013	994	--	--
14.0	10.2	1,868	3.5x8	Upper	.0013	>859	[2]825	--
--	--	--	3.5x8	Upper	.0013	979	--	--
--	--	--	3.5x8	Lower	.0013	754	--	--
--	--	--	3.5x8	Lower	.0013	703	--	--
14.0	11.5	2,280	3.5x8	Upper	.0013	942	780	--
--	--	--	3.5x8.25	Upper	.0013	619	--	--
--	--	--	--	--	--	--	--	--
.0	12.1	--	3.5x7.5	Middle	.0009	245	[2]240	[2]250
--	--	--	3.5x7.5	Middle	.0009	>146	--	--
.0	9.1	915	3.5x8	Middle-bottom	.0009	250	258	--
--	--	--	3.5x8	Middle-bottom	.0009	266	--	--
.0	6.2	1,115	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	3.5x7.5	Lower	.0010	207	[2]200	[2]200
--	--	--	3.5x7.5	Lower	.0010	>172	--	--

Table 4. Summary of ice data collected at selected sites in South Dakota, 1999-2001—Continued

[°C, degrees Celsius; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 degrees Celsius; sec, seconds; in/sec, inches per second; lb/in^2, pounds per square inch; >, greater than; --, no data or not applicable]

Date of ice-data collection	Air temperature (°C)	Daily mean discharge (ft^3/s)	Description of ice sample	Total distance across transect (feet)	Distance from shore (feet)	Ice thickness (feet)
			Site 2, James River near Scotland			
02-11-99	-5.0	[2]550	Clear ice (columnar ice)	[3]120	30	0.7
			Clear ice (columnar ice)		50	--
			Clear ice (columnar ice)		50	--
			Clear ice (columnar ice)		50	--
			Clear ice (columnar ice)		50	--
			Clear ice (columnar ice)		55	.9
			Very thin ice		60-120	--
01-24-00	-5.0	[2]206	Cloudy ice (snow ice)	[3]122	30	1.0
			Cloudy ice (snow ice)		75	.5
			Cloudy ice (snow ice)		90	.5
			Cloudy ice (snow ice)		90	--
01-09-01	-3.0	[2]360	7 inches of cloudy/milky ice (snow ice), then clear ice (columnar ice)	[3]120	35	1.4
			8 inches of cloudy/milky ice (snow ice), then clear ice (columnar ice)		35	--
			9 inches of cloudy/milky ice (snow ice), then clear ice (columnar ice)		35	--
			4.5 inches of cloudy/milky ice (snow ice), then clear ice (columnar ice)		70	1.1
			4.5 inches of cloudy/milky ice (snow ice), then clear ice (columnar ice)		70	--
			4.5 inches of cloudy/milky ice (snow ice), then clear ice (columnar ice)		105	1.2
			4.5 inches of cloudy/milky ice (snow ice), then clear ice (columnar ice)		105	--
02-12-01	-8.3	[2]155	Slushy ice (deteriorated columnar and snow ice)	[3]135	50	1.7
			Slushy ice (deteriorated columnar and snow ice)		50	--
			Semi-clear ice (columnar ice)		50	--
			Semi-clear ice (columnar ice)		50	--
			Clear ice (columnar ice)		75	1.7
			Clear ice (columnar ice)		75	--
			Semi-clear ice (columnar ice)		100	1.6
			Semi-clear ice (columnar ice)		100	--
			Semi-clear ice (columnar ice)		100	--
			Semi-clear ice (columnar ice)		100	--

Snow depth (inches)	Depth of water (feet)	Specific conduc-tance (µS/cm)	Ice sample diameter by height (inches)	Where sample taken in column	Ice-crushing rate (in/sec)	Ice-crushing strength (lb/in^2)	Average ice-crushing strength at section (lb/in^2)	Average ice-crushing strength at site (rounded to nearest 25 lb/in^2)
0.0	0.7	--	--	--	--	--	--	475
--	--	--	4x8	Middle	0.0010	417	484	--
--	--	--	4x8	Middle	.0006	447	--	--
--	--	--	3.5x8	Middle	.0010	603	--	--
--	--	--	3.5x7	Middle	.0010	470	--	--
.0	.7	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
.0	1.3	--	4x6.5	Middle	.0008	694	694	625
.0	7.6	--	4x5	Middle	.0008	565	565	--
.0	4.9	--	4x6.5	Middle	.0008	605	634	--
--	--	--	4x5	--	.0005	663	--	--
.0	7.5	--	3.5x8	Upper	.0010	630	588	[2]500
--	--	--	3.5x8	Upper	.0010	609	--	--
--	--	--	3.5x6.25	Lower	.0010	526	--	--
.0	7.4	--	3.5x8	Upper	.0011	>359	[2]325	--
--	--	--	3.5x8	Upper	.0011	287	--	--
.0	2.4	--	3.5x8	Upper	.0010	578	620	--
--	--	--	3.5x8	Upper	.0010	661	--	--
2.0	6.6	2,490	3.5x7.5	Upper	.0010	401	444	500
--	--	--	3.5x7.5	Upper	.0010	411	--	--
--	--	--	3.5x7.5	Lower	.0010	552	--	--
--	--	--	3.5x7.5	Lower	.0010	411	--	--
2.0	6.0	1,907	3.5x8	Upper	.0010	318	370	--
--	--	--	3.5x8	Lower	.0010	422	--	--
5.0	4.0	1,897	3.5x7.5	Upper	.0010	869	692	--
--	--	--	3.5x7	Upper	.0010	578	--	--
--	--	--	3.5x7.75	Lower	.0010	614	--	--
--	--	--	3.5x7.75	Lower	.0010	705	--	--

Table 4. Summary of ice data collected at selected sites in South Dakota, 1999-2001—Continued

[°C, degrees Celsius; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 degrees Celsius; sec, seconds; in/sec, inches per second; lb/in^2, pounds per square inch; >, greater than; --, no data or not applicable]

Date of ice-data collection	Air temperature (°C)	Daily mean discharge (ft^3/s)	Description of ice sample	Total distance across transect (feet)	Distance from shore (feet)	Ice thickness (feet)
			Site 2, James River near Scotland—Continued			
03-20-01	12.0	[2]1,800	Open water	[3]150	0-10	0.0
			Slushy ice; very soft ice (deteriorated columnar and snow ice); 3 inches water/slush over ice		20	1.2
			Slushy ice; very soft ice (deteriorated columnar and snow ice); 3 inches water/slush over ice		25	1.4
			Clear to cloudy ice (columnar and snow ice); 3 inches water/slush over ice		33	1.6
			Clear to cloudy ice (columnar and snow ice); 3 inches water/slush over ice		35	--
			Clear to cloudy ice (columnar and snow ice); 3 inches water/slush over ice		40	1.6
			Clear to fractured ice (columnar ice); 3 inches water/slush over ice		45	--
			Slushy ice; very soft ice (deteriorated columnar and snow ice); 3 inches water/slush over ice		50	1.1
			Slushy ice; very soft ice (deteriorated columnar and snow ice); 3 inches water/slush over ice		60	.9
			Open water		140-150	.0
			Site 3, White River near Oacoma/Presho			
[4]01-28-00	-1	[5]160	Lot of sediment in ice (columnar ice)	[6]242	108	.7
			Much sediment in ice (columnar ice)		108	--
			Much sediment in ice (columnar ice)		108	--
			Much sediment in ice (columnar ice)		108	--
			Much sediment in ice (columnar ice)		160	1.0
			Much sediment in ice (columnar ice)		160	--
			Much sediment in ice (columnar ice)		202	1.0
			Much sediment in ice (columnar ice)		202	--
			Much sediment in ice (columnar ice)		202	--
			Much sediment in ice (columnar ice)		202	--
			Much sediment in ice (columnar ice)		202	--
[7]02-24-00	7.0	[2]700	Clear ice (columnar ice); some sediment in ice	[8]125	11	.9
			Clear ice; some sediment in ice		40	.7
			Clear ice; some sediment in ice		40	--

Snow depth (inches)	Depth of water (feet)	Specific conduc-tance (µS/cm)	Ice sample diameter by height (inches)	Where sample taken in column	Ice-crushing rate (in/sec)	Ice-crushing strength (lb/in^2)	Average ice-crushing strength at section (lb/in^2)	Average ice-crushing strength at site (rounded to nearest 25 lb/in^2)
0.0	--	1,060 (from open water along shore)	--	--	--	--	--	275
.0	--	145 (from water on top of ice)	--	--	--	--	--	--
.0	--	--	3.5x8	Middle	0.0010	276	276	--
.0	--	--	--	--	--	--	--	--
--	6.0	--	3.5x8	Middle	.0010	276	276	--
.0	--	--	--	--	--	--	--	--
--	4.0	--	3.5x7.25	Middle	.0010	255	255	--
.0	--	--	--	--	--	--	--	--
.0	--	--	3.5x7.25	Middle	.0010	297	297	--
.0	--	--	--	--	--	--	--	--
1.5	1.0	--	4x5	Middle	.0010	395	[2]450	[2]450
--	--	--	4x5	Middle	.0008	488	--	--
--	--	--	4x4.5	Middle	.0010	>419	--	--
--	--	--	4x4.5	Middle	.0008	475	--	--
1.5	1.2	--	4x4.5	Middle	.0010	482	530	--
--	--	--	4x4.5	Middle	.0008	579	--	--
1.5	2.6	--	4.x6	Middle	.0010	375	365	--
--	--	--	4x6	Middle	.0010	383	--	--
--	--	--	4x5.5	Middle	.0010	355	--	--
--	--	--	4.x6	Middle	.0008	371	--	--
--	--	--	4.4.5	Middle	.0008	342	--	--
.0	1.5	--	3.5x6	Middle	.0010	292	292	[2]225
.0	2.2	--	3.5x5	Middle	.0010	180	180	--
--	--	--	3.5x5	Middle	.0010	>122	[2]180	--

Table 4. Summary of ice data collected at selected sites in South Dakota, 1999-2001—Continued

[°C, degrees Celsius; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 degrees Celsius; sec, seconds; in/sec, inches per second; lb/in^2, pounds per square inch; >, greater than; --, no data or not applicable]

Date of ice-data collection	Air temperature (°C)	Daily mean discharge (ft^3/s)	Description of ice sample	Total distance across transect (feet)	Distance from shore (feet)	Ice thickness (feet)
			Site 3,White River near Oacoma/Presho—Continued			
[7]02-24-00			Clear ice; some sediment in ice		50	0.5
			Thin ice to open water		60-110	--
[7]01-10-01	-2.0	[2]116	Cloudy ice (snow ice)	[6]265	9.5	.8
			3.5 inches cloudy (snow ice), then 3 inches sediment-loaded, then 3.5 inches clear ice (columnar ice)		42	.8
			3.5 inches cloudy (snow ice), then 3 inches sediment-loaded, then 3.5 inches clear ice (columnar ice)		42	--
			2 inches cloudy (snow ice), then 4.5 inches sediment-loaded, then 3.5 inches clear ice (columnar ice)		69	1.2
			Cloudy ice (snow ice)		102	1.5
			Cloudy ice (snow ice)		102	--
			Cloudy ice (snow ice)		138	1.2
			4 inches cloudy (snow ice), then 1 inch sediment-loaded, then 5 inches clear ice (columnar ice)		142	--
			5 inches cloudy (snow ice), then 1 inch sediment-loaded, then 5 inches clear ice (columnar ice)		142	--
			Cloudy ice (snow ice)		185	1.3
			5 inches cloudy (snow ice), then 3.5 inches sediment-loaded, then 1.5 inches clear ice (columnar ice)		200	--
			Cloudy ice (snow ice)		215	1.0
			Cloudy ice (snow ice)		240	.8
			Cloudy ice (snow ice)		255	--
[7]02-13-01	--	[2]320	Thin ice; not much water	--	--	.1
[7,9]03-13-01	12.0	[2]6,500	Semi-clear ice (columnar ice)	[6]--	10	1.0
			Semi-clear ice (columnar ice)		10	1.2
			Semi-clear ice (columnar ice)		10	.9
			Semi-clear ice (columnar ice)		10	--
			Semi-clear ice (columnar ice)		10	--
			Semi-clear ice (columnar ice)		10	--
			Site 4, Grand River at Little Eagle			
[10]02-12-99	-4.0	[2]4,500	Semi-clear ice (columnar ice)	[6]--	5	1.2
			Milky-colored ice (snow ice)		5	1.2
			Clear ice (columnar ice)		5	1.2

Snow depth (inches)	Depth of water (feet)	Specific conduc-tance (µS/cm)	Ice sample diameter by height (inches)	Where sample taken in column	Ice-crushing rate (in/sec)	Ice-crushing strength (lb/in^2)	Average ice-crushing strength at section (lb/in^2)	Average ice-crushing strength at site (rounded to nearest 25 lb/in^2)
0.0	1.3	--	--	--	0.0010	--	--	--
.0	--	--	--	--	--	--	--	--
.0	1.8	--	--	--	--	--	--	[2]475
.0	1.7	--	3.5x7.25	Upper	.0010	422	431	--
--	--	--	3.5x8	Upper	.0010	440	--	--
.0	1.5	--	3.5x7.75	Upper	.0010	>318	[2]400	--
.0	1.6	--	3.5x7	Upper	.0010	585	585	--
--	--	--	3.5x6.75	Lower	.0010	585	--	--
.0	2.0	--	--	--	--	--	--	--
--	--	--	3.5x8	Upper	.0010	536	510	--
--	--	--	3.5x8	Upper	.0010	484	--	--
.0	1.7	--	--	--	--	--	--	--
--	--	--	3.5x8	Upper	.0010	474	474	--
.0	1.1	--	--	--	--	--	--	--
.0	1.7	--	--	--	--	--	--	--
--	1.5	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
.0	--	614	3.5x7	Middle	.0010	>157	[2]229	[2]225
.0	--	--	3.5x8	Middle	.0010	224	--	--
.0	--	--	3.5x8	Middle	.0010	224	--	--
--	--	--	3.5x6.5	Middle	.0010	271	--	--
--	--	--	3.5x7	Middle	.0010	229	--	--
--	--	--	3x5.7	Middle	.0010	214	--	--
.0	--	--	4x7.5	Middle	.0010	369	392	400
.0	--	--	3.5x7	Middle	.0010	229	--	--
.0	--	--	4x7	Middle	.0010	577	--	--

Table 4. Summary of ice data collected at selected sites in South Dakota, 1999-2001—Continued

[°C, degrees Celsius; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 degrees Celsius; sec, seconds; in/sec, inches per second; lb/in^2, pounds per square inch; >, greater than; --, no data or not applicable]

Date of ice-data collection	Air temperature (°C)	Daily mean discharge (ft^3/s)	Description of ice sample	Total distance across transect (feet)	Distance from shore (feet)	Ice thickness (feet)
			Site 4, Grand River at Little Eagle—Continued			
01-25-00	-5.0	[2]56	Cloudy ice (snow ice)	[6]115	20	1.2
			Clear ice (columnar ice)		50	1.0
			Cloudy ice (snow ice)		75	.9
			Cloudy ice (snow ice)		95	.8
02-25-00	5.0	[2]120	Water on ice in lot of spots; cloudy ice (snow ice)	[6]102	15	.5
			Water on ice in lot of spots; cloudy ice (snow ice)		15	--
			Water on ice in lot of spots; cloudy ice (snow ice)		45	.8
			Water on ice in lot of spots; cloudy ice (snow ice)		45	--
			Water on ice in lot of spots; cloudy ice (snow ice)		70	--
			Water on ice in lot of spots; cloudy ice (snow ice)		70	--
			Water on ice in lot of spots; cloudy ice (snow ice)		77	.6
			Some open water		77-102	--
01-10-01	--	[2]14	Thin ice; not much water	--	--	.2
02-14-01	--	[2]17	Thin ice; not much water	--	--	.2
[10]03-14-01	4.0	[2]3,000	Dirty-looking/soft ice (deteriorated columnar and snow ice)	[6]--	5-30	1.4
			Dirty-looking/soft ice (deteriorated columnar and snow ice)		5-30	1.4
			Clear/cloudy ice (columnar and snow ice)		5-30	1.4
			Dirty-looking/soft ice (deteriorated columnar and snow ice)		5-30	1.4
			Dirty-looking/soft ice (deteriorated columnar and snow ice)		5-30	1.4
			Site 5, Oahe Reservoir near Mobridge			
02-12-99	--	--	Clear ice (columnar ice)	[6]6,500	300	1.8
			Clear ice (columnar ice)		300	--
			Clear ice (columnar ice)		300	--
			Clear ice (columnar ice)		600	1.7
			Clear ice (columnar ice)		600	--
			Clear ice (columnar ice)		600	--
			Clear ice (columnar ice)		900	1.7
			Clear ice (columnar ice)		900	--
			Clear ice (columnar ice)		1,200	1.8
			Clear ice (columnar ice)		1,200	--
			Clear ice (columnar ice)		1,500	1.7
			Clear ice (columnar ice)		1,500	--

Snow depth (inches)	Depth of water (feet)	Specific conduc-tance (µS/cm)	Ice sample diameter by height (inches)	Where sample taken in column	Ice-crushing rate (in/sec)	Ice-crushing strength (lb/in^2)	Average ice-crushing strength at section (lb/in^2)	Average ice-crushing strength at site (rounded to nearest 25 lb/in^2)
0.0	1.2	--	--	--	--	--	--	575
.0	1.7	--	4x7.5	Middle	0.0008	615	615	--
.0	2.1	--	--	--	--	--	--	--
.0	2.1	--	4x5	Middle	.0008	554	554	--
.0	1.4	--	--	Middle	.0007	526	505	300
--	--	--	--	Middle	.0007	484	--	--
.0	1.7	--	--	Middle	.0010	148	212	--
--	--	--	--	Middle	.0010	275	--	--
--	--	--	--	Middle	.0011	185	197	--
--	--	--	--	Middle	.0011	209	--	--
.0	2.2	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
.0	--	--	--	--	--	--	--	--
.0	--	--	--	--	--	--	--	--
.0	--	314	3.5x8	Middle	.0010	289	291	[2]300
.0	--	--	3.5x8	Middle	.0010	269	--	--
.0	--	--	3.5x8	Middle	.0010	411	--	--
.0	--	--	3.5x8	Middle	.0010	250	--	--
.0	--	--	3.5x7	Middle	.0010	236	--	--
.0	55.5	--	4x6.5	Middle	.0010	483	449	[2]500
--	--	--	4x8	Middle	.0010	463	--	--
--	--	--	3.5x7	Middle	.0010	402	--	--
.0	72.5	--	4x8	Middle	.0010	387	473	--
--	--	--	4x8	Middle	.0010	473	--	--
--	--	--	4x6	Lower	.0010	559	--	--
.0	75.0	--	4x7	Middle	.0010	566	626	--
--	--	--	4x5	Lower	.0010	685	--	--
.0	79.0	--	4x7.5	Middle	.0010	522	479	--
--	--	--	4x8	Middle	.0010	436	--	--
.0	76.5	--	4x8	Middle	.0010	465	[2]430	--
--	--	--	4x5.5	Lower	.0010	>369	--	--

Table 4. Summary of ice data collected at selected sites in South Dakota, 1999-2001—Continued

[°C, degrees Celsius; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 degrees Celsius; sec, seconds; in/sec, inches per second; lb/in^2, pounds per square inch; >, greater than; --, no data or not applicable]

Date of ice-data collection	Air temperature (°C)	Daily mean discharge (ft^3/s)	Description of ice sample	Total distance across transect (feet)	Distance from shore (feet)	Ice thickness (feet)
			Site 5, Oahe Reservoir near Mobridge—Continued			
01-25-00	-1.0	--	Clear ice (columnar ice)	[6]6,500	800	0.9
			Clear ice (columnar ice)		1,300	.9
			Clear ice (columnar ice)		1,750	1.0
			Clear ice (columnar ice)		2,350	.9
02-25-00	7.2	--	Ice deteriorating due to rain previous day	[6]6,500	500	1.1
			Ice crushed on 02-26-00		1,000	1.1
					2,000	1.2
					2,000	--
					3,000	.9
					3,000	--
					3,000	--
01-11-01	-4.0	--	Clear ice (columnar ice)	[6]6,500	650	1.7
			Clear ice (columnar ice)		650	--
			Clear ice (columnar ice)		1,200	1.7
			Clear ice (columnar ice)		1,200	--
			Clear ice (columnar ice)		1,200	--
			Clear ice (columnar ice)		1,200	--
			Clear ice (columnar ice)		2,300	1.8
			Clear ice (columnar ice)		2,300	--
			Clear ice (columnar ice)		3,300	1.7
			Clear ice (columnar ice)		3,300	--
			Clear ice (columnar ice)		3,300	--
			Clear ice (columnar ice)		4,300	1.4
			Clear ice (columnar ice)		4,300	--
			Clear ice (columnar ice)		4,300	--
			Clear ice (columnar ice)		4,300	--
02-14-01	-1.0	--	Clear ice (columnar ice)	[6]6,500	800	2.2
			Clear ice (columnar ice)		800	--
			Clear ice (columnar ice)		800	--
			Clear ice (columnar ice)		800	--
			Clear ice (columnar ice)		1,500	2.1
			Clear ice (columnar ice)		1,500	--
			Clear ice (columnar ice)		1,500	--
			Clear ice (columnar ice)		1,500	--

Snow depth (inches)	Depth of water (feet)	Specific conduc-tance (µS/cm)	Ice sample diameter by height (inches)	Where sample taken in column	Ice-crushing rate (in/sec)	Ice-crushing strength (lb/in^2)	Average ice-crushing strength at section (lb/in^2)	Average ice-crushing strength at site (rounded to nearest 25 lb/in^2)
0.0	71.2	--	4x5	Middle	0.0010	472	472	600
.0	71.2	--	4x8	Middle	.0010	883	883	--
.0	75.1	--	4x7.5	Middle	.0010	475	475	--
.0	71.1	--	4x7	Middle	.0010	531	531	--
.0	>70	--	3.5x6	Middle	.0010	571	571	[2]525
.0	>70	--	3.5x6	Middle	.0010	247	247	--
.0	>70	--	3.5x6	Middle	.0010	573	581	--
--	--	--	3.5x6.5	Middle	.0010	588	--	--
.0	>70	--	3.5x6	Middle	.0008	633	707	--
--	--	--	3.5x6	Middle	.0010	754	--	--
--	--	--	3.5x5.5	Middle	.0010	735	--	--
.0	57.0	--	3.5x8	Upper	.0010	474	546	[2]550
--	--	--	3.5x6.25	Lower	.0010	619	--	--
.0	62.0	--	3.5x6.5	Upper	.0008	462	596	--
--	--	--	3.5x7.25	Upper	.0008	401	--	--
--	--	--	3.5x8	Lower	.0008	474	--	--
--	--	--	3.5x8	Lower	.0008	>1,046	--	--
.0	65.0	--	3.5x8	Upper	.0010	391	669	--
--	--	--	3.5x6.5	Lower	.0010	947	--	--
.0	64.0	--	3.5x8	Upper	.0010	453	548	--
--	--	--	3.5x7.5	Lower	.0010	583	--	--
--	--	--	3.5x7.5	Upper	.0010	607	--	--
.0	70.0	--	3.5x8	Upper	.0010	474	439	--
--	--	--	3.5x8	Upper	.0010	375	--	--
--	--	--	3.5x8	Lower	.0010	391	--	--
--	--	--	3.5x7.25	Lower	.0010	517	--	--
4.0	61.4	694	3.5x7	Upper	.0010	848	665	[2]650
--	--	--	3.5x7	Upper	.0010	931	--	--
--	--	--	3.5x7.5	Lower	.0010	318	--	--
--	--	--	3.5x7.5	Lower	.0010	562	--	--
4.0	70.3	587	3.5x8	Upper	.0010	739	[2]675	--
--	--	--	3.5x8	Upper	.0010	599	--	--
--	--	--	3.5x7.5	Lower	.0010	>573	--	--
--	--	--	3.5x8	Lower	.0010	723	--	--

Table 4. Summary of ice data collected at selected sites in South Dakota, 1999-2001—Continued

[°C, degrees Celsius; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 degrees Celsius; sec, seconds; in/sec, inches per second; lb/in^2, pounds per square inch; >, greater than; --, no data or not applicable]

Date of ice-data collection	Air temperature (°C)	Daily mean discharge (ft^3/s)	Description of ice sample	Total distance across transect (feet)	Distance from shore (feet)	Ice thickness (feet)
			Site 5, Oahe Reservoir near Mobridge—Continued			
02-14-01			Clear ice (columnar ice)		2,100	1.9
			Clear ice (columnar ice)		2,100	--
			Clear ice (columnar ice)		2,100	--
			Clear ice (columnar ice)		2,100	--
03-21-01	2.0	--	Samples taken from ice mass (deteriorated columnar ice); 10-20 feet open water	[6]6,500	10	.0
					20	.7-1.0
					20	1.1
					20	1.2
					20	--
			Site 6, Lake Francis Case at the Platte-Winner Bridge			
01-09-01	7.0	--	Clear ice (columnar ice)	[1]5,000	100	1.3
			Snowy/milky ice (snow ice)		200	1.6
			Greenish clear ice (columnar ice)		500	1.3
			Greenish clear ice (columnar ice)		1,000	1.4
			Greenish clear ice (columnar ice)		1,000	--
			Greenish clear ice (columnar ice)		2,000	1.2
			Greenish clear ice (columnar ice)		2,000	--
02-13-01	-4.0	--	Top 2.5 inches cloudy; rest clear ice	[3]5,000	900	1.7
			Top 2.5 inches cloudy; rest clear ice		900	--
			Top 2.5 inches cloudy; rest clear ice		900	--
			Clear ice (columnar ice)		1,800	1.8
			Clear ice (columnar ice)		1,800	--
			Clear ice (columnar ice)		1,800	--
			Clear ice (columnar ice)		2,700	1.8
			Clear ice (columnar ice)		2,700	--
			Clear ice (columnar ice)		2,700	--
			Clear ice (columnar ice)		2,700	--

[1]Distance measured from east shore.
[2]Estimated.
[3]Distance measured from west shore.
[4]Measured near Presho (25 miles upstream of Oacoma site).
[5]Estimated using Oacoma site.
[6]Distance measured from north shore.
[7]Measured near Oacoma.
[8]Distance measured from south shore.
[9]Sampled from ice jam.
[10]From shore from ice breakup.

Snow depth (inches)	Depth of water (feet)	Specific conduc-tance (µS/cm)	Ice sample diameter by height (inches)	Where sample taken in column	Ice-crushing rate (in/sec)	Ice-crushing strength (lb/in^2)	Average ice-crushing strength at section (lb/in^2)	Average ice-crushing strength at site (rounded to nearest 25 lb/in^2)
4.0	65.3	538	3.5x8.25	Upper	0.0010	578	614	--
--	--	--	3.5x6.5	Upper	.0010	593	--	--
--	--	--	3.5x8	Lower	.0010	786	--	--
--	--	--	3.5x7.75	Lower	.0010	500	--	--
--	--	--	--	--	--	--	--	75
.0	--	215	3.5x7	Middle	.0010	58	68	--
.0	>70	--	3.5x7.25	Middle	.0010	79	--	--
.0	>70	--	3.5x7.25	Middle	.0010	73	--	--
--	--	--	3.5x6.5	Middle	.0010	63	--	--
.0	6.5	--	3.5x8	Upper	.0010	157	157	[2]250
.0	9.5	--	3.5x8	Upper	.0010	151	151	--
.0	30.5	--	3.5x6	Upper	.0010	396	396	--
.0	46.0	--	3.5x8	Upper	.0013	428	326	--
--	--	--	3.5x8	Upper	.0013	224	--	--
.0	58.0	--	3.5x8	Upper	.0010	162	282	--
--	--	--	3.5x8	Upper	.0010	401	--	--
2.0	30.0	527	3.5x7.5	Upper	.0010	709	705	[2]725
--	--	--	3.5x8	Upper	.0010	635	--	--
--	--	--	3.5x7	Lower	.0010	771	--	--
2.0	43.6	624	3.5x7	Upper	.0010	593	794	--
--	--	--	3.5x7	Upper	.0010	907	--	--
--	--	--	3.5x7.25	Lower	.0010	881	--	--
2.0	62.3	707	3.5x8	Upper	.0010	715	692	--
--	--	--	3.5x7.75	Upper	.0010	737	--	--
--	--	--	3.5x7.5	Lower	.0010	627	--	--
--	--	--	3.5x6.5	Lower	.0010	687	--	--

Table 5. Summary of historical ice-thickness data measured at selected U.S. Geological Survey streamflow-gaging stations in South Dakota, 1970-97

[ft, feet; ft^3/s, cubic feet per second; mi, miles; --, no data]

Date	Ice thickness (ft)			Daily mean discharge (ft^3/s)	Additional location information
	Left	Center	Right		
Station 06357800 (Grand River at Little Eagle) Period of Record 11-24-75 to 02-27-97					
11-24-75	--	--	0.4	19	1,000 ft above gage
12-22-75	1.1	1.0	1.2	9	500 ft above gage
01-19-76	1.3	1.1	1.2	11	500 ft above gage
03-16-76	.3	.3	.6	90	800 ft above gage
12-21-76	1.2	1.2	1.2	.56	100 ft below gage
11-23-77	.6	.5	.6	0	--
12-19-77	1.5	1.2	1.2	0	--
12-06-78	.6	.8	.7	37	At gage
01-12-79	1.3	.7	.8	3.3	At gage
12-06-79	.3	.3	.4	25	400 ft above gage
01-10-80	1.4	1.3	1.3	2.9	300 ft above gage
03-05-80	.5	.8	.7	13	800 ft above gage
01-07-81	1.0	.6	.5	5	300 ft below gage
01-06-82	.8	.6	.7	1.5	600 ft below gage
03-03-82	.3	.5	.5	102	300 ft below gage
12-07-82	.6	.8	.6	140	75 ft below gage
11-30-83	.3	.3	.4	15	200 ft below gage
12-05-83	1.2	1.3	1.3	12	--
12-05-84	.4	.2	.3	12	100 ft below gage
01-10-85	1.1	.9	.9	3.4	100 ft below gage
02-06-85	1.6	1.9	1.6	0	At gage
11-20-85	.4	.4	.4	11	250 ft below gage
12-18-85	1.5	1.0	1.6	20	50 ft below gage
01-23-86	1.6	1.7	1.0	26	100 ft below gage
02-20-86	2.4	1.9	2.1	14	50 ft below gage
11-19-86	.6	.6	.6	82	900 ft below gage
12-17-86	.9	.9	1.0	52	600 ft below gage
01-14-87	.9	1.0	1.3	55	900 ft below gage
11-11-87	.9	1.0	1.1	62	125 ft below gage
12-29-87	.7	.6	.4	31	500 ft below gage
01-14-88	1.1	1.1	1.3	.5	600 ft below gage
02-10-88	2.9	2.5	2.8	4.1	750 ft below gage
12-20-88	.5	.3	.6	18	250 ft below gage
02-14-89	.9	1.0	.7	5.7	400 ft below gage
03-08-89	1.0	1.1	1.4	5.3	300 ft below gage

Table 5. Summary of historical ice-thickness data measured at selected U.S. Geological Survey streamflow-gaging stations in South Dakota, 1970-97–Continued

[ft, feet; ft^3/s, cubic feet per second; mi, miles; --, no data]

Date	Ice thickness (ft)			Daily mean discharge (ft^3/s)	Additional location information
	Left	Center	Right		
Station 06357800 (Grand River at Little Eagle) Period of Record 11-24-75 to 02-27-97—Continued					
12-20-89	0.6	0.8	0.8	0.7	150 ft below gage
02-01-90	1.1	1.1	1.2	13	150 ft below gage
12-04-90	.3	.4	.3	4.5	150 ft below gage
03-04-91	.3	.6	.4	28	250 ft below gage
11-07-91	.6	.4	.6	2.5	150 ft below gage
01-06-92	.9	.6	.8	4	200 ft below gage
02-11-92	.2	.6	.3	24	250 ft below gage
11-30-92	--	.3	.3	9.5	300 ft below gage
03-01-93	.1	--	.1	3.7	250 ft below gage
01-04-94	1.1	.9	1.0	50	400 ft below gage
02-15-94	1.2	1.2	1.4	49	400 ft below gage
01-10-95	1.1	.9	1.0	30	300 ft below gage
12-01-95	.6	--	.6	102	300 ft below gage
01-24-96	1.6	1.2	1.8	56	350 ft below gage
01-21-97	1.6	1.5	1.7	69	250 ft below gage
02-27-97	2.1	1.6	1.8	113	250 ft below gage
Station 06452000 (White River near Oacoma) Period of Record 12-05-75 to 01-13-95					
12-05-75	.4	.5	.6	6.5	500 ft below gage
01-09-76	1.3	1.4	.8	11	At gage
01-29-76	1.5	1.1	1.2	38	200 ft above gage
12-03-76	.8	.7	.8	7	300 ft above gage
01-03-77	.9	.8	.7	11	0.5 mi below gage
01-27-77	1.8	1.6	1.7	10	At gage
11-29-77	.6	.5	.4	90	100 ft below gage
12-22-77	1.0	.8	.8	90	400 ft below gage
01-16-78	1.3	1.0	.9	70	600 ft from gage
02-21-78	1.4	1.1	.9	55	600 ft below gage
12-04-78	.5	.5	.3	40	500 ft below gage
01-08-79	1.5	1.4	1.5	13	400 ft below gage
02-05-79	2.2	1.8	2.0	25	300 ft below gage
03-05-79	1.0	2.3	2.2	36	300 ft below gage
12-04-79	.3	.3	.3	66	50 ft below gage
01-07-80	.7	.9	.7	30	0.5 mi below gage
02-05-80	1.1	1.0	1.1	56	0.5 mi below gage
03-03-80	1.7	1.1	1.6	295	300 ft above gage

Table 5. Summary of historical ice-thickness data measured at selected U.S. Geological Survey streamflow-gaging stations in South Dakota, 1970-97–Continued

[ft, feet; ft^3/s, cubic feet per second; mi, miles; --, no data]

Date	Ice thickness (ft)			Daily mean discharge (ft^3/s)	Additional location information
	Left	Center	Right		
Station 06452000 (White River near Oacoma) Period of Record 12-05-75 to 01-13-95—Continued					
12-03-80	0.3	0.4	0.4	32	500 ft above gage
02-17-81	1.9	2.0	1.6	110	300 ft below gage
12-23-82	.2	.3	.4	160	50 ft below gage
01-20-83	.8	.9	.9	230	250 ft below gage
12-27-83	.8	.6	.7	85	50 ft below gage
01-23-84	1.3	1.3	1.2	85	30 ft below gage
12-03-84	.2	.2	.3	41	50 ft below gage
12-28-84	.9	.8	.7	25	30 ft below gage
01-25-85	1.3	1.3	1.2	49	75 ft below gage
02-21-85	1.7	1.8		65	300 ft above gage
12-10-85	.7	.5	.6	59	10 ft above gage
01-14-86	.8	.9	1.2	54	75 ft below gage
02-18-86	.9	1.4	1.2	160	100 ft above gage
12-05-86	.3	--	.2	75	150 ft below gage
01-08-87	.7	.5	.7	190	50 ft below gage
01-30-87	.9	.6	.8	170	125 ft below gage
01-07-88	.8	.6	.7	22	100 ft below gage
12-16-88	.3	.4	.4	81	60 ft below gage
01-18-89	1.0	.9	1.0	32	100 ft below gage
02-27-89	1.3	1.3	1.3	81	100 ft above gage
12-08-89	.4	.5	.7	104	150 ft below wire-weight gage
01-23-90	.4	.8	.5	187	125 ft below wire-weight gage
11-29-90	.2	.3	.3	21	120 ft below gage
01-07-91	.8	.7	.8	.05	30 ft below gage
01-14-91	1.3	1.1	1.2	.34	800 ft below gage
01-16-92	.8	.5	1.0	75	125 ft below gage
01-08-93	1.0	.8	.8	14	At gage
03-02-93	.6	1.1	1.1	68	600 ft below gage
12-08-93	.5	.5	.5	280	700 ft below gage
01-24-94	1.1	1.3	.8	85	700 ft below gage
12-09-94	.4	.3	.3	58	100 ft below gage
12-09-94	.5	.5	.5	58	--
01-13-95	.8	.8	.6	71	At gage
01-13-95	1.0	.8	.8	71	--

Table 5. Summary of historical ice-thickness data measured at selected U.S. Geological Survey streamflow-gaging stations in South Dakota, 1970-97–Continued

[ft, feet; ft^3/s, cubic feet per second; mi, miles; --, no data]

Date	Ice thickness (ft)			Daily mean discharge (ft^3/s)	Additional location information
	Left	Center	Right		
Station 06478500 (James River near Scotland) Period of Record 12-28-70 to 03-04-97					
12-28-70	0.7	0.4	0.4	24	800 ft below gage
01-21-71	1.0	.4	.3	14	800 ft below gage
02-11-71	1.1	.4	.5	14	400 ft below gage
01-12-72	.6	.3	.4	96	800 ft below gage
02-01-72	1.1	.6	.6	46	300 ft below gage
02-23-72	.9	.2	.4	52	500 ft below gage
12-20-72	.4	.0	.3	81	1/4 mi below gage
01-03-73	.3	.0	.4	96	1/4 mi below gage
01-24-73	1.2	1.1	1.3	250	At gage
02-12-73	.3	.4	.5	87	1/4 mi below gage
12-19-73	.0	.0	.0	32	1/4 mi below gage
01-17-74	.6	.0	.0	26	300 ft below gage
02-22-74	.0	.0	.0	118	1/4 mi below gage
01-15-75	.5	.5	.3	14	300 ft below gage
02-12-75	.5	.4	.4	15	300 ft below gage
03-14-75	.3	.0	.3	30	300 ft below gage
12-09-75	1.2	.7	.7	260	10 ft above bridge
01-12-76	.8	.9	1.1	113	300 ft below gage
02-11-76	.4	.4	.9	79	250 ft below gage
03-09-76	.0	.0	.5	160	300 ft below gage
01-20-77	.3	.3	1.1	3.3	300 ft below gage
12-29-77	.5	.0	.7	22	400 ft below gage
01-30-78	1.1	.7	1.2	20	300 ft below gage
02-27-78	.7	.6	.7	22	250 ft below gage
12-20-78	.5	.0	.6	65	400 ft below gage
01-22-79	.9	1.0	1.0	38	Below gage
02-20-79	.4	.8	.8	31	Below gage
12-17-79	.5	.0	.4	226	Below gage
01-22-80	.0	.0	.4	104	Below gage
02-12-80	.1	.3	.4	42	Below gage
12-27-82	.5	.6	.7	173	30 ft below gage
01-27-83	.3	.5	.5	92	1/4 mi below gage
12-13-83	.6	.4	.5	188	300 ft below gage
01-18-84	.6	.4	1.0	73	100 ft below gage
02-15-84	1.5	1.2	1.4	107	400 ft above gage

Table 5. Summary of historical ice-thickness data measured at selected U.S. Geological Survey streamflow-gaging stations in South Dakota, 1970-97–Continued

[ft, feet; ft^3/s, cubic feet per second; mi, miles; --, no data]

Date	Ice thickness (ft)			Daily mean discharge (ft^3/s)	Additional location information
	Left	Center	Right		
Station 06478500 (James River near Scotland) Period of Record 12-28-70 to 03-04-97—Continued					
03-14-84	1.3	1.3	1.7	590	150 ft below gage
01-14-85	.3	.2	.3	68	1/2 mi below gage
01-06-86	.3	.3	1.0	65	200 ft below dam
02-18-86	.1	.2	.2	55	200 ft below dam
01-20-87	.0	.0	.4	177	200 ft below dam
02-18-88	1.2	.5	1.0	80	300 ft below gage
02-07-89	.4	.3	.3	20	300 ft below gage
12-13-89	.3	.0	.4	30	100 ft below gage
11-14-91	.0	.0	.0	50	200 ft below gage
12-26-91	.0	.0	.0	34	200 ft below gage
01-21-93	.6	.5	.6	40	350 ft below gage
01-14-94	1.1	1.0	1.1	470	400 ft below gage
12-19-94	.7	.6	.5	432	20 ft below gage
01-09-96	.6	1.0	1.1	233	1/2 mi below gage
11-25-96	.7	.5	.6	540	60 ft below gage
01-07-97	1.6	.7	1.3	215	500 ft below gage
03-04-97	1.7	1.3	2.0	160	200 ft below gage
Station 06478513 (James River near Yankton) Period of Record 02-02-82 to 01-31-95					
02-02-82	1.3	1.5	.2	14	500 ft below gage
12-16-82	.5	.4	.3	190	--
01-12-83	.7	.9	.8	185	500 ft below gage
02-04-83	.7	.8	.8	80	1/3 mi below gage
12-07-83	.6	.4	.4	190	50 ft above gage
01-05-84	.9	1.0	.4	130	100 ft above gage
02-08-84	1.2	1.3	.5	85	30 ft above gage
03-08-84	1.0	1.0	.6	620	20 ft above bridge
01-15-85	.6	.7	.5	85	100 ft above gage
02-20-85	1.2	1.0	.7	100	At gage
01-07-86	.8	.8	.4	72	50 ft below gage
02-20-86	.5	.6	.4	60	50 ft above gage
12-16-86	.3	.0	.0	290	100 ft above gage
01-21-87	.4	.0	.0	200	50 ft above gage
02-16-88	.7	1.1	.8	80	50 ft above gage
12-28-89	.7	.7	.6	15	30 ft above gage
02-13-90	.5	.2	.0	29	50 ft above gage

Table 5. Summary of historical ice-thickness data measured at selected U.S. Geological Survey streamflow-gaging stations in South Dakota, 1970-97–Continued

[ft, feet; ft^3/s, cubic feet per second; mi, miles; --, no data]

Date	Ice thickness (ft)			Daily mean discharge (ft^3/s)	Additional location information
	Left	Center	Right		
Station 06478513 (James River near Yankton) Period of Record 02-02-82 to 01-31-95—Continued					
02-05-91	0.6	0.8	0.4	25	25 ft above gage
11-12-91	.0	.0	.0	42	50 ft above gage
12-27-91	.3	.4	.0	29	75 ft above gage
02-09-93	.0	.8	.0	260	30 ft above gage
12-19-94	.6	.6	.7	410	100 ft above gage
01-31-95	.8	1.0	1.1	140	100 ft above gage
Station 06479000 (Vermillion River near Wakonda) Period of Record 12-16-70 to 02-08-83					
12-16-70	.5	.6	.6	6.2	25 ft below gage
01-14-71	1.8	1.8	2.0	2.5	75 ft below gage
02-18-71	.0	.0	.0	35	75 ft below gage
12-10-71	.3	.3	.3	9.9	300 ft below gage
01-12-72	.9	.6	.8	4.7	700 ft above gage
02-11-72	1.0	1.0	.9	1.8	300 ft below gage
12-19-72	.6	.6	.5	12	150 ft below gage
01-16-73	1.1	1.0	1.2	10	100 ft below gage
01-24-73	.0	.0	.5	65	50 ft below gage
02-13-73	1.5	1.6	2.0	20	40 ft below gage
12-12-73	.3	.4	.3	18	800 ft above gage
01-17-74	1.3	1.2	1.2	6.7	800 ft above gage
02-25-74	1.3	.9	1.2	48	800 ft above gage
12-17-74	.3	.3	.5	4.9	1/4 mi below gage
01-22-75	.8	1.4	1.0	2	200 ft below gage
03-19-75	.0	.0	.0	4.6	1/4 mi below gage
11-25-75	.4	.4	.4	3.9	Below gage
01-15-76	.0	.0	.0	1.6	1/4 mi below gage
12-16-76	.0	.0	.0	.59	1/4 mi below gage
01-20-77	.0	1.4	.0	.01	1/4 mi below gage
12-14-77	.4	.5	.6	7.6	1/8 mi below gage
01-20-78	.0	.0	.0	.43	1/8 mi below control
03-01-78	.0	.0	.0	.47	1/8 mi below gage
12-12-78	.5	.4	.2	14	Beaver dam
01-23-79	1.1	1.0	1.1	6.9	1/4 mi below gage
02-21-79	.5	.0	.0	6.8	Below gage
12-19-79	.3	.6	.5	47	Below gage
01-23-80	.6	.5	.6	32	--

Table 5. Summary of historical ice-thickness data measured at selected U.S. Geological Survey streamflow-gaging stations in South Dakota, 1970-97–Continued

[ft, feet; ft^3/s, cubic feet per second; mi, miles; --, no data]

Date	Ice thickness (ft)			Daily mean discharge (ft^3/s)	Additional location information
	Left	Center	Right		
Station 06479000 (Vermillion River near Wakonda) Period of Record 12-16-70 to 02-08-83—Continued					
02-13-80	0.8	0.9	0.8	21	Below gage, control
02-18-81	.5	.9	1.0	8.1	1,000 ft below gage
01-13-82	.5	.3	.3	1	3/4 mi below gage
02-01-82	.0	.0	.0	.8	1/2 mi below gage
12-14-82	.5	.5	.4	177	500 ft above gage
01-13-83	2.0	1.2	1.0	75	At gage
02-08-83	1.8	1.9	2.0	50	At gage
Station 06479010 (Vermillion River near Vermillion) Period of Record 12-06-83 to 02-07-96					
12-06-83	.5	.2	.8	85	100 ft above gage
02-09-84	.0	.0	.0	64	100 ft above gage
01-16-85	.4	.3	.3	65	300 ft above gage
12-05-85	.4	.7	.3	50	100 ft from gage
01-08-86	.0	.6	.7	45	100 ft above gage
02-20-86	.0	.0	.0	35	50 ft below gage
12-16-86	.4	.4	.4	150	200 ft above gage
01-22-87	.4	.3	.3	50	200 ft below gage
12-17-87	.3	.3	.3	37	200 ft above gage
02-18-88	.0	.0	1.2	24	300 ft above gage
12-20-88	.0	.0	.3	22	75 ft above gage
02-28-89	.3	.0	.5	8	150 ft above gage
12-28-89	.8	1.0	1.1	7.5	40 ft above gage
02-13-90	.0	.6	.5	15	75 ft above gage
12-06-90	.0	.3	.3	8.5	75 ft above gage
02-06-91	.5	1.4	1.5	8.8	200 ft above gage
11-13-91	1.2	.9	1.2	15	50 ft above gage
12-27-91	.8	.6	.7	7.5	50 ft above gage
01-20-93	1.0	1.2	.8	60	50 ft above gage
02-11-93	.0	.0	.0	102	75 ft above gage
01-14-94	.5	.4	.4	50	100 ft above gage
02-01-95	.0	.0	.0	39	150 ft above gage
02-07-96	.8	.4	1.2	120	150 ft above gage
Station 06480000 (Big Sioux River near Brookings) Period of Record 11-30-78 to 12-16-94					
11-30-70	.3	.3	.4	48	300 ft below gage
01-05-71	1.3	1.3	1.4	14	200 ft below gage
02-02-71	1.4	1.3	1.6	4.5	200 ft below gage

Table 5. Summary of historical ice-thickness data measured at selected U.S. Geological Survey streamflow-gaging stations in South Dakota, 1970-97–Continued

[ft, feet; ft^3/s, cubic feet per second; mi, miles; --, no data]

Date	Ice thickness (ft)			Daily mean discharge (ft^3/s)	Additional location information
	Left	Center	Right		
Station 06480000 (Big Sioux River near Brookings) Period of Record 11-30-78 to 12-16-94—Continued					
03-03-71	0.4	0.3	0.3	190	150 ft below gage
01-03-72	.4	.5	.5	30	300 ft below gage
02-07-72	1.0	1.0	.8	6.1	300 ft below gage
03-06-72	1.5	1.3	.7	5.8	300 ft below gage
12-04-72	.5	.0	.4	92	300 ft below gage
01-11-73	.6	1.3	.6	32	150 ft below gage
01-30-73	.3	1.2	.9	53	300 ft below gage
01-09-74	.7	.5	.6	6.5	300 ft below gage
02-12-74	.9	.8	1.0	6.8	300 ft below gage
12-04-74	.3	.3	.3	5.8	200 ft below gage
01-07-75	.5	.5	.3	4.1	150 ft below gage
02-03-75	1.7	1.5	1.7	.71	150 ft above gage
03-04-75	2.0	1.8	1.6	.57	100 ft above gage
04-02-75	1.8	1.7	1.1	3.1	100 ft above bridge
12-02-75	.6	.8	.9	3.3	--
01-12-76	1.4	1.4	1.1	2.3	75 ft above gage
02-02-76	1.4	1.5	1.2	2.5	75 ft above gage
03-01-76	1.7	1.5	1.1	37	50 ft below gage
03-01-77	.6	.5	.6	0	300 ft below gage
11-30-77	.3	.3	.4	109	150 ft above gage
01-04-78	1.2	1.3	1.0	37	150 ft above gage
02-06-78	1.8	2.0	1.0	12	150 ft above gage
03-07-78	.7	1.1	2.2	12	150 ft above gage
12-06-78	.5	.3	.3	20	200 ft below gage
01-10-79	.9	.0	.4	3.8	200 ft below gage
02-07-79	.7	1.0	.9	2.9	250 ft below gage
03-06-79	1.8	.9	1.2	2.5	200 ft below gage
12-05-79	.0	.0	.0	91	200 ft below gage
01-22-80	.4	.5	.3	37	200 ft below gage
02-13-80	.6	1.0	.7	20	150 ft below gage
03-12-80	.4	1.1	.6	21	200 ft below gage
01-15-81	.6	.8	.9	6.2	100 ft below gage
12-16-81	.0	.0	.3	11	200 ft below gage
01-18-83	.9	.8	.5	50	150 ft below gage
02-17-83	.8	.6	.0	50	100 ft above gage

Table 5. Summary of historical ice-thickness data measured at selected U.S. Geological Survey streamflow-gaging stations in South Dakota, 1970-97–Continued

[ft, feet; ft^3/s, cubic feet per second; mi, miles; --, no data]

Date	Ice thickness (ft)			Daily mean discharge (ft^3/s)	Additional location information
	Left	Center	Right		
Station 06480000 (Big Sioux River near Brookings) Period of Record 11-30-78 to 12-16-94—Continued					
12-27-83	1.2	1.0	0.5	28	150 ft below gage
01-09-84	.4	1.3	.9	45	200 ft above gage
02-08-84	.4	1.4	.4	29	200 ft above gage
03-08-84	.7	1.3	.5	530	400 ft below gage
01-07-85	.6	.4	.5	90	200 ft below gage
02-05-85	.5	1.2	.6	45	200 ft below gage
12-10-85	.7	.7	.7	175	120 ft below gage
01-13-86	.7	1.2	1.0	120	100 ft below gage
02-18-86	.7	1.6	1.1	88	150 ft below gage
12-17-86	.7	.5	.4	210	100 ft below gage
02-24-88	.0	1.9	1.8	15	150 ft below gage
03-22-89	.4	.2	.3	69	100 ft below gage
12-27-89	.8	.8	1.0	3	200 ft below gage
02-20-90	.7	.4	.5	5.7	200 ft below gage
02-21-91	.5	.7	.9	22	250 ft below gage
11-08-91	.6	.5	.5	44	375 ft below gage
12-19-91	.4	.7	.8	40	275 ft below gage
01-23-92	.5	.7	.8	40	100 ft below gage
12-17-92	.3	.0	.7	127	150 ft below gage
02-24-93	.5	1.5	1.3	60	150 ft below gage
03-25-93	.4	1.3	1.7	100	100 ft below gage
01-13-94	.7	.8	.9	160	100 ft below gage
12-16-94	2.0	.0	.7	190	200 ft below gage
Station 06481000 (Big Sioux River near Dell Rapids) Period of record 12-17-70 to 03-06-97					
12-17-70	.6	.3	.4	50	800 ft below gage
02-03-71	.6	1.1	1.2	10	600 ft below gage
01-10-72	.5	.8	.2	38	800 ft below gage
01-31-72	1.0	1.5	.4	14	600 ft below gage
03-03-72	1.0	1.1	.2	14	600 ft below gage
12-07-72	.4	.3	.4	122	800 ft below gage
12-20-72	.6	.9	.8	80	600 ft below gage
01-11-73	.7	1.2	1.0	47	600 ft below gage
01-31-73	.6	.9	1.0	95	1/4 mi below gage
01-10-74	.9	1.3	1.0	14	300 ft above gage
02-12-74	1.0	1.4	1.3	13	300 ft above gage

Table 5. Summary of historical ice-thickness data measured at selected U.S. Geological Survey streamflow-gaging stations in South Dakota, 1970-97–Continued

[ft, feet; ft^3/s, cubic feet per second; mi, miles; --, no data]

Date	Ice thickness (ft)			Daily mean discharge (ft^3/s)	Additional location information
	Left	Center	Right		
Station 06481000 (Big Sioux River near Dell Rapids) Period of record 12-17-70 to 03-06-97—Continued					
12-03-74	0.0	0.0	0.0	15	1 3/4 mi above gage
02-06-75	.5	.8	.8	5.6	1 1/2 mi above gage
03-03-75	.1	.5	1.2	6.6	1 1/2 mi above gage
04-02-75	.5	.4	.4	20	300 ft below gage
12-02-75	.8	.0	.5	13	1 1/2 mi above gage
12-19-75	.3	.4	.5	7.5	1 1/2 mi above gage
01-05-76	.6	.5	.7	9.7	1 1/4 mi above gage
02-05-76	1.2	1.0	.3	8	Above gage
02-19-76	1.2	1.6	1.3	20	300 ft above gage
03-01-76	.5	1.1	.3	220	300 ft above gage
01-04-77	.5	.4	.5	1.7	250 ft below gage
12-07-77	.5	.6	.6	111	300 ft above gage
12-22-77	.9	.8	.8	114	300 ft above gage
01-05-78	1.0	1.1	.9	56	300 ft above gage
01-23-78	1.3	1.6	1.2	32	300 ft above gage
02-06-78	1.3	1.8	1.6	22	300 ft above gage
02-14-78	1.2	1.8	1.5	20	300 ft above gage
03-03-78	1.5	2.1	1.4	18	300 ft above gage
12-04-78	.5	.6	.4	33	200 ft above gage
01-09-79	1.0	1.5	1.4	12	200 ft above gage
02-06-79	1.0	1.8	1.3	10	300 ft above gage
03-05-79	.9	1.5	1.3	13	200 ft above gage
12-05-79	.4	.0	.4	155	300 ft above gage
01-21-80	.8	.7	.9	65	200 ft above gage
02-12-80	1.0	1.1	1.2	40	200 ft above gage
03-13-80	1.2	1.0	.9	46	200 ft above gage
12-22-80	.5	.6	.5	20	600 ft below gage
01-29-81	1.4	1.2	1.5	17	500 ft above gage
12-17-81	.3	.4	.4	21	400 ft below gage
01-25-83	1.0	.9	1.2	83	300 ft below gage
12-15-83	.7	.7	.5	150	--
01-16-84	.9	.8	.5	65	--
02-13-84	1.4	1.0	.8	78	--
03-16-84	.8	1.2	1.4	280	--
01-02-85	.6	.0	.2	130	--

Table 5. Summary of historical ice-thickness data measured at selected U.S. Geological Survey streamflow-gaging stations in South Dakota, 1970-97–Continued

[ft, feet; ft^3/s, cubic feet per second; mi, miles; --, no data]

Date	Ice thickness (ft)			Daily mean discharge (ft^3/s)	Additional location information
	Left	Center	Right		
Station 06481000 (Big Sioux River near Dell Rapids) Period of record 12-17-70 to 03-06-97—Continued					
02-13-85	0.8	1.0	1.8	65	500 ft below gage
12-18-85	.7	.6	.8	200	300 ft below gage
01-15-86	.8	.6	1.3	150	300 ft below gage
02-20-86	1.8	1.9	1.4	120	200 ft below gage
01-09-87	.5	.0	.2	250	250 ft below gage
02-16-88	1.5	1.7	1.3	17	700 ft below gage
12-13-88	.0	.0	.0	20	300 ft below gage
02-05-91	.0	.0	.3	14	400 ft below gage
11-06-91	.4	.0	.4	190	300 ft below gage
12-19-91	.2	.0	.2	375	400 ft below gage
03-01-93	1.0	1.4	.7	390	300 ft below gage
01-14-94	1.3	1.4	1.0	160	150 ft above gage
03-04-94	2.2	2.0	1.3	80	300 ft above gage
01-05-96	.8	.8	.4	120	800 ft below gage
02-06-96	1.6	1.6	1.2	160	700 ft below gage
01-16-97	1.0	1.3	1.0	80	500 ft below gage
03-06-97	1.4	1.2	1.3	120	700 ft below gage

Table 6. Comparison between measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Study-Collected Data											
Huron	James River	02-06-99	1	Huron	1.3	1.4	0.1	1.6	0.3	1.4	0.1
Huron	James River	01-20-00	1	Huron	1.0	1.0	.0	1.1	.1	1.1	.1
Huron	James River	02-24-00	1	Huron	1.3	1.1	.2	1.4	.1	1.6	.3
Huron	James River	01-08-01	1	Huron	1.8	1.7	.1	1.8	.0	.8	1.0
Huron	James River	02-12-01	1	Huron	2.3	2.1	.2	2.3	.0	1.1	1.2
Huron	James River	04-02-01	1	Huron	2.2	2.5	.3	2.6	.4	1.2	1.0
Scotland	James River	02-11-99	2	Yankton	.9	1.2	.3	1.3	.4	.9	.0
Scotland	James River	01-24-00	2	Yankton	1.0	.9	.1	.9	.1	1.2	.2
Scotland	James River	01-09-01	2	Yankton	1.4	1.6	.2	1.7	.3	.9	.5
Scotland	James River	02-12-01	2	Yankton	1.7	1.9	.2	2.0	.3	1.2	.5
Scotland	James River	03-20-01	2	Yankton	1.6	2.1	.5	2.2	.6	1.3	.3
Presho	White River	01-28-00	3	Gann Valley	1.0	1.1	.1	1.2	.2	1.6	.6
Oacoma	White River	02-24-00	3	Gann Valley	.9	1.3	.4	1.4	.5	1.9	1.0
Oacoma	White River	01-10-01	3	Gann Valley	1.5	1.7	.2	1.8	.3	2.5	1.0
Oacoma	White River	03-13-01	3	Gann Valley	1.2	2.4	([1])	2.5	([1])	3.6	([1])
Oacoma	White River	03-13-01	3	Gann Valley	1.2	1.2	.0	1.3	.1	1.6	.4
Little Eagle	Grand River	02-12-99	4	Eureka	1.2	1.7	.5	1.8	.6	2.0	.8
Little Eagle	Grand River	01-25-00	4	Eureka	1.2	1.3	.1	1.3	.1	1.9	.7
Little Eagle	Grand River	02-25-00	4	Eureka	.8	1.5	.7	1.6	.8	2.4	1.6
Little Eagle	Grand River	03-14-01	4	Eureka	1.4	2.5	([1])	2.6	([1])	2.7	([1])
Little Eagle	Grand River	03-14-01	4	Eureka	1.4	1.2	.2	1.3	.1	.9	.5
near Mobridge	Oahe Reservoir	02-12-99	5	Eureka	1.8	1.7	.1	1.8	.0	2.0	.2

Table 6. Comparison between measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Study-Collected Data—Continued											
near Mobridge	Oahe Reservoir	01-25-00	5	Eureka	1.0	1.3	0.3	1.3	0.3	1.9	0.9
near Mobridge	Oahe Reservoir	02-25-00	5	Eureka	1.2	1.5	.3	1.6	.4	2.4	1.2
near Mobridge	Oahe Reservoir	01-11-01	5	Eureka	1.8	1.9	.1	1.9	.1	1.8	.0
near Mobridge	Oahe Reservoir	02-14-01	5	Eureka	2.2	2.2	.0	2.4	.2	2.3	.1
near Mobridge	Oahe Reservoir	03-21-01	5	Eureka	1.0	2.5	([1])	2.6	([1])	2.7	([1])
Platte-Winner	Lake Francis Case	01-09-01	6	Academy	1.6	1.6	.0	1.7	.1	.6	1.0
Platte-Winner	Lake Francis Case	02-13-01	6	Academy	1.8	1.9	.1	2.0	.2	.8	1.0
Historical Data											
Little Eagle	Grand River	01-19-76	06357800	Mobridge	1.3	1.5	.2	1.6	.3	1.6	.3
Little Eagle	Grand River	12-21-76	06357800	Mobridge	1.2	1.1	.1	1.2	.0	1.4	.2
Little Eagle	Grand River	12-19-77	06357800	Mobridge	1.5	1.2	.3	1.2	.3	.4	1.1
Little Eagle	Grand River	12-06-78	06357800	Mobridge	.8	1.1	.3	1.1	.3	.6	.2
Little Eagle	Grand River	01-10-80	06357800	Mobridge	1.4	1.1	.3	1.2	.2	1.3	.1
Little Eagle	Grand River	01-07-81	06357800	Mobridge	1.0	1.0	.0	1.1	.1	1.3	.3
Little Eagle	Grand River	01-06-82	06357800	Mobridge	.8	1.3	.5	1.4	.6	1.1	.3
Little Eagle	Grand River	12-07-82	06357800	Mobridge	.8	.5	.3	.7	.1	.6	.2
Little Eagle	Grand River	12-05-83	06357800	Mobridge	1.3	.7	.6	.8	.5	.5	.8
Little Eagle	Grand River	02-06-85	06357800	Mobridge	1.9	2.0	.1	2.1	.2	2.2	.3
Little Eagle	Grand River	01-20-86	06357800	Mobridge	1.7	1.8	.1	1.9	.2	.6	1.1
Little Eagle	Grand River	02-20-86	06357800	Mobridge	2.4	2.2	.2	2.3	.1	.9	1.5
Little Eagle	Grand River	01-14-87	06357800	Mobridge	1.3	1.0	.3	1.1	.2	.6	.7
Little Eagle	Grand River	01-14-88	06357800	Mobridge	1.3	1.2	.1	1.3	.0	1.3	.0
Little Eagle	Grand River	02-10-88	06357800	Mobridge	2.9	1.6	1.3	1.7	1.2	1.8	1.1
Little Eagle	Grand River	02-14-89	06357800	Mobridge	1.0	1.7	.7	1.8	.8	1.2	.2
Little Eagle	Grand River	02-01-90	06357800	Mobridge	1.2	1.5	.3	1.6	.4	1.9	.7

Table 6. Comparison between measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Historical Data—Continued											
Little Eagle	Grand River	12-04-90	06357800	Mobridge	0.4	0.5	0.1	0.5	0.1	0.5	0.1
Little Eagle	Grand River	01-06-92	06357800	Mobridge	.8	1.0	.2	1.1	.3	1.1	.3
Little Eagle	Grand River	02-15-94	06357800	Mobridge	1.4	2.1	.7	2.2	.8	1.0	.4
Little Eagle	Grand River	01-10-95	06357800	Mobridge	1.1	1.3	.2	1.4	.3	.9	.2
Little Eagle	Grand River	01-24-96	06357800	Mobridge	1.8	1.5	.3	1.6	.2	1.7	.1
Little Eagle	Grand River	01-21-97	06357800	Mobridge	1.7	2.0	.3	2.1	.4	.8	.9
Little Eagle	Grand River	02-27-97	06357800	Mobridge	2.1	2.3	.2	2.5	.4	.8	1.3
Oacoma	White River	01-29-76	06452000	Gann Valley	1.5	1.5	.0	1.6	.1	1.7	.2
Oacoma	White River	01-27-77	06452000	Gann Valley	1.8	1.7	.1	1.9	.1	2.4	.6
Oacoma	White River	02-21-78	06452000	Gann Valley	1.4	2.3	.9	2.4	1.0	1.9	.5
Oacoma	White River	02-05-79	06452000	Gann Valley	2.2	2.1	.1	2.2	.0	2.5	.3
Oacoma	White River	03-05-79	06452000	Gann Valley	2.3	2.4	.1	2.5	.2	2.8	.5
Oacoma	White River	03-03-80	06452000	Gann Valley	1.7	1.5	.2	1.6	.1	2.2	.5
Oacoma	White River	12-03-80	06452000	Gann Valley	.4	.4	.0	.5	.1	.2	.2
Oacoma	White River	02-17-81	06452000	Gann Valley	2.0	1.3	.7	1.4	.6	1.7	.3
Oacoma	White River	01-20-83	06452000	Gann Valley	.9	1.0	.1	1.1	.2	1.2	.3
Oacoma	White River	01-23-84	06452000	Gann Valley	1.3	1.9	.6	2.0	.7	.8	.5
Oacoma	White River	02-21-85	06452000	Gann Valley	1.8	1.9	.1	2.1	.3	2.1	.3
Oacoma	White River	01-14-86	06452000	Gann Valley	1.2	1.8	.6	1.9	.7	.6	.6
Oacoma	White River	01-30-87	06452000	Gann Valley	.9	1.0	.1	1.1	.2	1.4	.5
Oacoma	White River	01-07-88	06452000	Gann Valley	.8	1.1	.3	1.2	.4	.7	.1
Oacoma	White River	02-27-89	06452000	Gann Valley	1.3	1.8	.5	1.9	.6	1.6	.3
Oacoma	White River	01-23-90	06452000	Gann Valley	.8	1.4	.6	1.5	.7	1.8	1.0
Oacoma	White River	01-14-91	06452000	Gann Valley	1.3	1.6	.3	1.7	.4	2.1	.8
Oacoma	White River	01-08-93	06452000	Gann Valley	1.0	1.4	.4	1.5	.5	2.1	1.1

Table 6. Comparison between measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Historical Data—Continued											
Oacoma	White River	01-24-94	06452000	Gann Valley	1.3	1.7	0.4	1.8	0.5	1.7	0.4
Oacoma	White River	01-13-95	06452000	Gann Valley	1.0	1.3	.3	1.4	.4	1.5	.5
Scotland	James River	02-11-71	06478500	Yankton	1.1	1.8	.7	1.9	.8	1.9	.8
Scotland	James River	02-01-72	06478500	Yankton	1.1	1.6	.5	1.7	.6	1.5	.4
Scotland	James River	01-24-73	06478500	Yankton	1.3	1.4	.1	1.5	.2	1.3	.0
Scotland	James River	01-17-74	06478500	Yankton	.6	1.5	.9	1.6	1.0	1.3	.7
Scotland	James River	01-15-75	06478500	Yankton	.5	1.2	.7	1.1	.6	1.1	.6
Scotland	James River	12-09-75	06478500	Yankton	1.2	.8	.4	.9	.3	.2	1.0
Scotland	James River	01-20-77	06478500	Yankton	1.1	1.6	.5	1.7	.6	2.3	1.2
Scotland	James River	01-30-78	06478500	Yankton	1.2	1.8	.6	1.9	.7	1.9	.7
Scotland	James River	01-22-79	06478500	Yankton	1.0	1.7	.7	1.8	.8	2.2	1.2
Scotland	James River	12-17-79	06478500	Yankton	.5	.7	.2	.8	.3	.6	.1
Scotland	James River	12-27-82	06478500	Yankton	.7	.4	.3	.7	.0	.4	.3
Scotland	James River	02-15-84	06478500	Yankton	1.5	1.8	.3	1.9	.4	.7	.8
Scotland	James River	03-14-84	06478500	Yankton	1.7	1.9	.2	2.0	.3	.7	1.0
Scotland	James River	01-14-85	06478500	Yankton	.3	1.2	.9	1.2	.9	1.4	1.1
Scotland	James River	01-06-86	06478500	Yankton	1.0	1.6	.6	1.7	.7	1.5	.5
Scotland	James River	01-20-87	06478500	Yankton	.4	.8	.4	.9	.5	1.1	.7
Scotland	James River	02-18-88	06478500	Yankton	1.2	1.7	.5	1.8	.6	1.6	.4
Scotland	James River	02-07-89	06478500	Yankton	.4	1.1	.7	1.2	.8	1.6	1.2
Scotland	James River	12-13-89	06478500	Yankton	.4	.7	.3	.8	.4	.5	.1
Scotland	James River	12-26-91	06478500	Yankton	.0	.7	.7	.8	.8	.5	.5
Scotland	James River	01-21-93	06478500	Yankton	.6	1.4	.8	1.5	.9	1.5	.9
Scotland	James River	01-14-94	06478500	Yankton	1.1	1.2	.1	1.3	.2	1.3	.2
Scotland	James River	12-19-94	06478500	Yankton	.7	.8	.1	.9	.2	.3	.4

Table 6. Comparison between measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Historical Data—Continued											
Scotland	James River	01-09-96	06478500	Yankton	1.1	1.0	0.1	1.1	0.0	1.0	0.1
Scotland	James River	11-25-96	06478500	Yankton	.7	.6	.1	.7	.0	.5	.2
Scotland	James River	01-07-97	06478500	Yankton	1.6	1.4	.2	1.5	.1	1.5	.1
Scotland	James River	03-04-97	06478500	Yankton	2.0	2.0	.0	2.1	.1	2.0	.0
Yankton	James River	02-02-82	06478513	Yankton	1.5	1.6	.1	1.8	.3	1.1	.4
Yankton	James River	12-16-82	06478513	Yankton	.5	.5	.0	.6	.1	.4	.1
Yankton	James River	01-12-83	06478513	Yankton	.9	.7	.2	.9	.0	.3	.6
Yankton	James River	02-04-83	06478513	Yankton	.8	1.1	.3	1.2	.4	.5	.3
Yankton	James River	12-07-83	06478513	Yankton	.6	.7	.1	.8	.2	.3	.3
Yankton	James River	01-05-84	06478513	Yankton	1.0	1.5	.5	1.6	.6	.5	.5
Yankton	James River	02-08-84	06478513	Yankton	1.3	1.8	.5	1.9	.6	.7	.6
Yankton	James River	03-08-84	06478513	Yankton	1.0	1.9	.9	2.0	1.0	.7	.3
Yankton	James River	01-15-85	06478513	Yankton	.7	1.2	.5	1.3	.6	1.4	.7
Yankton	James River	02-20-85	06478513	Yankton	1.2	1.7	.5	1.8	.6	1.9	.7
Yankton	James River	01-07-86	06478513	Yankton	.8	1.6	.8	1.7	.9	1.6	.8
Yankton	James River	01-21-87	06478513	Yankton	.4	.7	.3	.7	.3	.8	.4
Yankton	James River	02-16-88	06478513	Yankton	1.1	1.7	.6	1.8	.7	1.6	.5
Yankton	James River	12-28-89	06478513	Yankton	.7	1.3	.6	1.4	.7	.7	.0
Yankton	James River	02-05-91	06478513	Yankton	.8	1.5	.7	1.6	.8	1.7	.9
Yankton	James River	12-27-91	06478513	Yankton	.4	.9	.5	1.0	.6	.5	.1
Yankton	James River	02-09-93	06478513	Yankton	.8	1.4	.6	1.6	.8	1.5	.7
Yankton	James River	01-31-95	06478513	Yankton	1.1	1.3	.2	1.4	.3	1.2	.1
Wakonda	Vermillion River	01-14-71	06479000	Yankton	2.0	1.4	.6	1.5	.5	1.1	.9
Wakonda	Vermillion River	02-11-72	06479000	Yankton	1.0	1.8	.8	1.9	.9	1.7	.7

Table 6. Comparison between measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Historical Data—Continued											
Wakonda	Vermillion River	01-16-73	06479000	Yankton	1.2	1.4	0.2	1.5	0.3	1.3	0.1
Wakonda	Vermillion River	02-13-73	06479000	Yankton	2.0	1.5	.5	1.6	.4	1.5	.5
Wakonda	Vermillion River	01-17-74	06479000	Yankton	1.3	1.5	.2	1.6	.3	1.3	.0
Wakonda	Vermillion River	01-22-75	06479000	Yankton	1.0	1.1	.1	1.2	.2	1.2	.2
Wakonda	Vermillion River	11-25-75	06479000	Yankton	.4	.5	.1	.6	.2	.1	.3
Wakonda	Vermillion River	01-20-77	06479000	Yankton	1.4	1.6	.2	1.7	.3	2.3	.9
Wakonda	Vermillion River	12-14-77	06479000	Yankton	.6	.8	.2	.9	.3	1.1	.5
Wakonda	Vermillion River	01-23-79	06479000	Yankton	1.1	1.7	.6	1.8	.7	2.2	1.1
Wakonda	Vermillion River	02-13-80	06479000	Yankton	.9	1.4	.5	1.5	.6	1.7	.8
Wakonda	Vermillion River	02-18-81	06479000	Yankton	1.0	1.3	.3	1.4	.4	1.7	.7
Wakonda	Vermillion River	01-13-82	06479000	Yankton	.5	1.1	.6	1.4	.9	.9	.4
Wakonda	Vermillion River	01-13-83	06479000	Yankton	2.0	.8	1.2	1.0	1.0	.2	1.8
Vermillion	Vermillion River	01-05-84	06479010	Yankton	.9	1.5	.6	1.6	.7	.5	.4
Vermillion	Vermillion River	01-16-85	06479010	Yankton	.4	1.2	.8	1.3	.9	1.4	1.0
Vermillion	Vermillion River	12-05-85	06479010	Yankton	.7	1.1	.4	1.1	.4	.8	.1
Vermillion	Vermillion River	12-16-86	06479010	Yankton	.4	.6	.2	.7	.3	.6	.2
Vermillion	Vermillion River	02-18-88	06479010	Yankton	1.2	1.7	.5	1.8	.6	1.6	.4
Vermillion	Vermillion River	02-28-89	06479010	Yankton	.5	1.4	.9	1.5	1.0	2.0	1.5
Vermillion	Vermillion River	12-28-89	06479010	Yankton	1.1	1.3	.2	1.4	.3	.9	.2
Vermillion	Vermillion River	02-06-91	06479010	Yankton	1.5	1.5	.0	1.6	.1	1.8	.3
Vermillion	Vermillion River	11-13-91	06479010	Yankton	1.2	.7	.5	.8	.4	.2	1.0
Vermillion	Vermillion River	01-20-93	06479010	Yankton	1.2	1.4	.2	1.4	.2	1.5	.3
Vermillion	Vermillion River	01-14-94	06479010	Yankton	.5	1.2	.7	1.4	.9	1.3	.8
Vermillion	Vermillion River	02-01-95	06479010	Yankton	.0	1.3	1.3	1.4	1.4	1.2	1.2
Vermillion	Vermillion River	02-07-96	06479010	Yankton	1.2	1.5	.3	1.6	.4	1.9	.7

Table 6. Comparison between measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Historical Data—Continued											
Brookings	Big Sioux River	02-02-71	06480000	Brookings	1.6	2.0	0.4	2.1	0.5	1.9	0.3
Brookings	Big Sioux River	03-06-72	06480000	Brookings	1.5	2.4	.9	2.5	1.0	1.8	.3
Brookings	Big Sioux River	01-11-73	06480000	Brookings	1.3	1.6	.3	1.7	.4	2.0	.7
Brookings	Big Sioux River	02-12-74	06480000	Brookings	1.0	2.0	1.0	2.1	1.1	1.6	.6
Brookings	Big Sioux River	02-03-75	06480000	Brookings	1.7	1.6	.1	1.7	.0	1.6	.1
Brookings	Big Sioux River	03-04-75	06480000	Brookings	2.0	2.0	.0	2.1	.1	2.0	.0
Brookings	Big Sioux River	01-12-76	06480000	Brookings	1.4	1.6	.2	1.8	.4	.9	.5
Brookings	Big Sioux River	02-02-76	06480000	Brookings	1.5	1.9	.4	2.0	.5	1.0	.5
Brookings	Big Sioux River	03-01-76	06480000	Brookings	1.7	2.0	.3	2.1	.4	1.1	.6
Brookings	Big Sioux River	03-01-77	06480000	Brookings	.6	2.3	1.7	2.4	1.8	3.4	2.8
Brookings	Big Sioux River	02-06-78	06480000	Brookings	2.0	2.3	.3	2.4	.4	2.3	.3
Brookings	Big Sioux River	03-07-78	06480000	Brookings	2.2	2.6	.4	2.8	.6	2.5	.3
Brookings	Big Sioux River	03-06-79	06480000	Brookings	1.8	2.7	.9	2.8	1.0	3.0	1.2
Brookings	Big Sioux River	02-13-80	06480000	Brookings	1.0	1.7	.7	1.8	.8	2.3	1.3
Brookings	Big Sioux River	01-15-81	06480000	Brookings	.9	1.3	.4	1.4	.5	1.9	1.0
Brookings	Big Sioux River	12-16-81	06480000	Brookings	.3	.8	.5	.9	.6	.5	.2
Brookings	Big Sioux River	01-18-83	06480000	Brookings	.9	1.3	.4	1.4	.5	1.4	.5
Brookings	Big Sioux River	12-27-83	06480000	Brookings	1.2	1.6	.4	1.7	.5	.6	.6
Brookings	Big Sioux River	02-08-84	06480000	Brookings	1.4	2.1	.7	2.2	.8	1.2	.2
Brookings	Big Sioux River	02-05-85	06480000	Brookings	1.2	1.9	.7	2.0	.8	2.4	1.2
Brookings	Big Sioux River	02-18-86	06480000	Brookings	1.6	2.3	.7	2.4	.8	1.4	.2
Brookings	Big Sioux River	12-17-86	06480000	Brookings	.7	1.0	.3	1.1	.4	1.4	.7
Brookings	Big Sioux River	02-24-88	06480000	Brookings	1.9	2.1	.2	2.3	.4	1.4	.5
Brookings	Big Sioux River	12-27-89	06480000	Brookings	1.0	1.5	.5	1.6	.6	2.2	1.2
Brookings	Big Sioux River	02-21-91	06480000	Brookings	.9	1.9	1.0	2.0	1.1	2.4	1.5
Brookings	Big Sioux River	02-24-92	06480000	Brookings	1.5	1.6	.1	1.7	.2	2.0	.5

Table 6. Comparison between measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Historical Data—Continued											
Brookings	Big Sioux River	03-25-92	06480000	Brookings	1.7	1.6	0.1	1.7	0.0	1.9	0.2
Brookings	Big Sioux River	01-13-94	06480000	Brookings	.9	1.6	.7	1.7	.8	.9	.0
Brookings	Big Sioux River	12-16-94	06480000	Brookings	2.0	.9	1.1	1.0	1.0	.7	1.3
Dell Rapids	Big Sioux River	02-03-71	06481000	Sioux Falls	1.2	1.8	.6	2.0	.8	1.6	.4
Dell Rapids	Big Sioux River	01-10-72	06481000	Sioux Falls	.8	1.5	.7	1.5	.7	.8	.0
Dell Rapids	Big Sioux River	01-31-72	06481000	Sioux Falls	1.5	1.8	.3	1.9	.4	1.3	.2
Dell Rapids	Big Sioux River	01-11-73	06481000	Sioux Falls	1.2	1.5	.3	1.6	.4	1.8	.6
Dell Rapids	Big Sioux River	02-12-74	06481000	Sioux Falls	1.4	1.8	.4	1.9	.5	1.5	.1
Dell Rapids	Big Sioux River	03-03-75	06481000	Sioux Falls	1.2	1.8	.6	1.9	.7	1.8	.6
Dell Rapids	Big Sioux River	02-05-76	06481000	Sioux Falls	1.2	1.7	.5	1.8	.6	1.0	.2
Dell Rapids	Big Sioux River	02-19-76	06481000	Sioux Falls	1.6	1.7	.1	1.8	.2	1.0	.6
Dell Rapids	Big Sioux River	01-04-77	06481000	Sioux Falls	.5	1.4	.9	1.5	1.0	1.8	1.3
Dell Rapids	Big Sioux River	02-06-78	06481000	Sioux Falls	1.8	2.1	.3	2.2	.4	2.5	.7
Dell Rapids	Big Sioux River	03-03-78	06481000	Sioux Falls	2.1	2.4	.3	2.5	.4	2.7	.6
Dell Rapids	Big Sioux River	02-06-79	06481000	Sioux Falls	1.8	2.2	.4	2.3	.5	2.2	.4
Dell Rapids	Big Sioux River	02-12-80	06481000	Sioux Falls	1.2	1.6	.4	1.6	.4	1.9	.7
Dell Rapids	Big Sioux River	01-29-81	06481000	Sioux Falls	1.5	1.2	.3	1.3	.2	1.8	.3
Dell Rapids	Big Sioux River	12-17-81	06481000	Sioux Falls	.4	.7	.3	.8	.4	.5	.1
Dell Rapids	Big Sioux River	01-25-83	06481000	Sioux Falls	1.2	1.2	.0	1.3	.1	.9	.3
Dell Rapids	Big Sioux River	02-13-84	06481000	Sioux Falls	1.4	2.0	.6	2.1	.7	1.0	.4
Dell Rapids	Big Sioux River	02-13-85	06481000	Sioux Falls	1.8	1.8	.0	1.9	.1	2.5	.7
Dell Rapids	Big Sioux River	02-20-86	06481000	Sioux Falls	1.9	2.1	.2	2.2	.3	1.2	.7
Dell Rapids	Big Sioux River	01-09-87	06481000	Sioux Falls	.5	1.0	.5	1.1	.6	1.3	.8
Dell Rapids	Big Sioux River	02-16-88	06481000	Sioux Falls	1.7	1.9	.2	2.0	.3	1.1	.6
Dell Rapids	Big Sioux River	12-13-88	06481000	Sioux Falls	.0	.6	.6	.7	.7	.7	.7

Table 6. Comparison between measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Historical Data—Continued											
Dell Rapids	Big Sioux River	02-05-91	06481000	Sioux Falls	0.3	1.6	1.3	1.7	1.4	1.3	1.0
Dell Rapids	Big Sioux River	12-19-91	06481000	Sioux Falls	.3	.7	.4	1.1	.8	.8	.5
Dell Rapids	Big Sioux River	03-01-93	06481000	Sioux Falls	1.4	1.9	.5	2.0	.6	1.7	.3
Dell Rapids	Big Sioux River	03-04-94	06481000	Sioux Falls	2.2	2.0	.2	2.1	.1	1.8	.4
Dell Rapids	Big Sioux River	02-06-96	06481000	Sioux Falls	1.6	1.7	.1	1.9	.3	2.0	.4
Dell Rapids	Big Sioux River	01-16-97	06481000	Sioux Falls	1.3	1.6	.3	1.7	.4	1.1	.2
				Average difference, in feet			.4		.5		.6
				Number of samples used in analysis			199		199		199
				Standard deviation			.3		.3		.4

[1]Not calculated because representative maximum ice thickness was not obtained due to unsafe ice conditions; samples collected only near shore.

Table 7. Comparison between measured and equation-estimated ice thickness at selected sites in South Dakota using only study-collected ice-thickness data

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Huron	James River	02-06-99	1	Huron	1.3	1.4	0.1	1.6	0.3	1.4	0.1
Huron	James River	01-20-00	1	Huron	1.2	1.0	.2	1.1	.1	1.1	.1
Huron	James River	02-24-00	1	Huron	1.3	1.1	.2	1.4	.1	1.6	.3
Huron	James River	01-08-01	1	Huron	1.8	1.7	.1	1.8	.0	.8	1.0
Huron	James River	02-12-01	1	Huron	2.3	2.1	.2	2.3	.0	1.1	1.2
Huron	James River	04-02-01	1	Huron	2.2	2.5	.3	2.6	.4	1.2	1.0
Scotland	James River	02-11-99	2	Yankton	.9	1.2	.3	1.3	.4	.9	.0
Scotland	James River	01-24-00	2	Yankton	1.0	.9	.1	.9	.1	1.2	.2
Scotland	James River	01-09-01	2	Yankton	1.4	1.6	.2	1.7	.3	.9	.5
Scotland	James River	02-12-01	2	Yankton	1.7	1.9	.2	2.0	.3	1.2	.5
Scotland	James River	03-20-01	2	Yankton	1.6	2.1	.5	2.2	.6	1.3	.3
Presho	White River	01-28-00	3	Gann Valley	1.0	1.1	.1	1.2	.2	1.6	.6
Oacoma	White River	02-24-00	3	Gann Valley	.9	1.3	.4	1.4	.5	1.9	1.0
Oacoma	White River	01-10-01	3	Gann Valley	1.5	1.7	.2	1.8	.3	2.5	1.0
Oacoma	White River	03-13-01	3	Gann Valley	1.2	2.4	([1])	2.5	([1])	3.6	([1])
Oacoma	White River	03-13-01	3	Gann Valley	1.2	1.2	.0	1.3	.1	1.6	.4
Little Eagle	Grand River	02-12-99	4	Eureka	1.2	1.7	.5	1.8	.6	2.0	.8
Little Eagle	Grand River	01-25-00	4	Eureka	1.2	1.3	.1	1.3	.1	1.9	.7
Little Eagle	Grand River	02-25-00	4	Eureka	.8	1.5	.7	1.6	.8	2.4	1.6

Table 7. Comparison between measured and equation-estimated ice thickness at selected sites in South Dakota using only study-collected ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Little Eagle	Grand River	03-14-01	4	Eureka	1.4	2.5	([1])	2.6	([1])	2.7	([1])
Little Eagle	Grand River	03-14-01	4	Eureka	1.4	1.2	0.2	1.3	0.1	.9	0.5
near Mobridge	Oahe Reservoir	02-12-99	5	Eureka	1.8	1.7	.1	1.8	.0	2.0	.2
near Mobridge	Oahe Reservoir	01-25-00	5	Eureka	1.0	1.3	.3	1.3	.3	1.9	.9
near Mobridge	Oahe Reservoir	02-25-00	5	Eureka	1.2	1.5	.3	1.6	.4	2.4	1.2
near Mobridge	Oahe Reservoir	01-11-01	5	Eureka	1.8	1.9	.1	1.9	.1	1.8	.0
near Mobridge	Oahe Reservoir	02-14-01	5	Eureka	2.2	2.2	.0	2.4	.2	2.3	.1
near Mobridge	Oahe Reservoir	03-21-01	5	Eureka	1.0	2.5	([1])	2.6	([1])	2.7	([1])
Platte-Winner	Lake Francis Case	01-09-01	6	Academy	1.6	1.6	.0	1.7	.1	.6	1.0
Platte-Winner	Lake Francis Case	02-13-01	6	Academy	1.8	1.9	.1	2.0	.2	.8	1.0
				Average difference, in feet			.2		.3		.6
				Number of samples used in analysis			26		26		26
				Standard deviation			.2		.2		.4

[1]Not calculated because representative maximum ice thickness was not obtained due to unsafe ice conditions; samples collected only near shore.

Table 8. Comparison between equal or greater-than-1.0-foot measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Study-Collected Data											
Huron	James River	02-06-99	1	Huron	1.3	1.4	0.1	1.6	0.3	1.4	0.1
Huron	James River	01-20-00	1	Huron	1.2	1.0	.2	1.1	.1	1.1	.1
Huron	James River	02-24-00	1	Huron	1.3	1.1	.2	1.4	.1	1.6	.3
Huron	James River	01-08-01	1	Huron	1.8	1.7	.1	1.8	.0	.8	1.0
Huron	James River	02-12-01	1	Huron	2.3	2.1	.2	2.3	.0	1.1	1.2
Huron	James River	04-02-01	1	Huron	2.2	2.5	.3	2.6	.4	1.2	1.0
Scotland	James River	01-24-00	2	Yankton	1.0	.9	.1	.9	.1	1.2	.2
Scotland	James River	01-09-01	2	Yankton	1.4	1.6	.2	1.7	.3	.9	.5
Scotland	James River	02-12-01	2	Yankton	1.7	1.9	.2	2.0	.3	1.2	.5
Scotland	James River	03-20-01	2	Yankton	1.6	2.1	.5	2.2	.6	1.3	.3
Presho	White River	01-28-00	3	Gann Valley	1.0	1.1	.1	1.2	.2	1.6	.6
Oacoma	White River	01-10-01	3	Gann Valley	1.5	1.7	.2	1.8	.3	2.5	1.0
Oacoma	White River	03-13-01	3	Gann Valley	1.2	1.2	.0	1.3	.1	1.6	.4
Little Eagle	Grand River	02-12-99	4	Eureka	1.2	1.7	.5	1.8	.6	2.0	.8
Little Eagle	Grand River	01-25-00	4	Eureka	1.2	1.3	.1	1.3	.1	1.9	.7
Little Eagle	Grand River	03-14-01	4	Eureka	1.4	1.2	.2	1.3	.1	.9	.5
near Mobridge	Oahe Reservoir	02-12-99	5	Eureka	1.8	1.7	.1	1.8	.0	2.0	.2
near Mobridge	Oahe Reservoir	01-25-00	5	Eureka	1.0	1.3	.3	1.3	.3	1.9	.9
near Mobridge	Oahe Reservoir	02-25-00	5	Eureka	1.2	1.5	.3	1.6	.4	2.4	1.2
near Mobridge	Oahe Reservoir	01-11-01	5	Eureka	1.8	1.9	.1	1.9	.1	1.8	.0
near Mobridge	Oahe Reservoir	02-14-01	5	Eureka	2.2	2.2	.0	2.4	.2	2.3	.1

Table 8. Comparison between equal or greater-than-1.0-foot measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Study-Collected Data—Continued											
Platte-Winner	Lake Francis Case	01-09-01	6	Academy	1.6	1.6	0.0	1.7	0.1	0.6	1.0
Platte-Winner	Lake Francis Case	02-13-01	6	Academy	1.8	1.9	.1	2.0	.2	.8	1.0
Historical Data											
Little Eagle	Grand River	01-19-76	06357800	Mobridge	1.3	1.5	.2	1.6	.3	1.6	.3
Little Eagle	Grand River	12-21-76	06357800	Mobridge	1.2	1.1	.1	1.2	.0	1.4	.2
Little Eagle	Grand River	12-19-77	06357800	Mobridge	1.5	1.2	.3	1.2	.3	.4	1.1
Little Eagle	Grand River	01-10-80	06357800	Mobridge	1.4	1.1	.3	1.2	.2	1.3	.1
Little Eagle	Grand River	01-07-81	06357800	Mobridge	1.0	1.0	.0	1.1	.1	1.3	.3
Little Eagle	Grand River	12-05-83	06357800	Mobridge	1.3	.7	.6	.8	.5	.5	.8
Little Eagle	Grand River	02-06-85	06357800	Mobridge	1.9	2.0	.1	2.1	.2	2.2	.3
Little Eagle	Grand River	01-20-86	06357800	Mobridge	1.7	1.8	.1	1.9	.2	.6	1.1
Little Eagle	Grand River	02-20-86	06357800	Mobridge	2.4	2.2	.2	2.3	.1	.9	1.5
Little Eagle	Grand River	01-14-87	06357800	Mobridge	1.3	1.0	.3	1.1	.2	.6	.7
Little Eagle	Grand River	01-14-88	06357800	Mobridge	1.3	1.2	.1	1.3	.0	1.3	.0
Little Eagle	Grand River	02-10-88	06357800	Mobridge	2.9	1.6	1.3	1.7	1.2	1.8	1.1
Little Eagle	Grand River	02-14-89	06357800	Mobridge	1.0	1.7	.7	1.8	.8	1.2	.2
Little Eagle	Grand River	02-01-90	06357800	Mobridge	1.2	1.5	.3	1.6	.4	1.9	.7
Little Eagle	Grand River	02-15-94	06357800	Mobridge	1.4	2.1	.7	2.2	.8	1.0	.4
Little Eagle	Grand River	01-10-95	06357800	Mobridge	1.1	1.3	.2	1.4	.3	.9	.2
Little Eagle	Grand River	01-24-96	06357800	Mobridge	1.8	1.5	.3	1.6	.2	1.7	.1
Little Eagle	Grand River	01-21-97	06357800	Mobridge	1.7	2.0	.3	2.1	.4	.8	.9
Little Eagle	Grand River	02-27-97	06357800	Mobridge	2.1	2.3	.2	2.5	.4	.8	1.3
Oacoma	White River	01-29-76	06452000	Gann Valley	1.5	1.5	.0	1.6	.1	1.7	.2
Oacoma	White River	01-27-77	06452000	Gann Valley	1.8	1.7	.1	1.9	.1	2.4	.6
Oacoma	White River	02-21-78	06452000	Gann Valley	1.4	2.3	.9	2.4	1.0	1.9	.5

Table 8. Comparison between equal or greater-than-1.0-foot measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Historical Data—Continued											
Oacoma	White River	02-05-79	06452000	Gann Valley	2.2	2.1	0.1	2.2	0.0	2.5	0.3
Oacoma	White River	03-05-79	06452000	Gann Valley	2.3	2.4	.1	2.5	.2	2.8	.5
Oacoma	White River	03-03-80	06452000	Gann Valley	1.7	1.5	.2	1.6	.1	2.2	.5
Oacoma	White River	02-17-81	06452000	Gann Valley	2.0	1.3	.7	1.4	.6	1.7	.3
Oacoma	White River	01-23-84	06452000	Gann Valley	1.3	1.9	.6	2.0	.7	.8	.5
Oacoma	White River	02-21-85	06452000	Gann Valley	1.8	1.9	.1	2.1	.3	2.1	.3
Oacoma	White River	01-14-86	06452000	Gann Valley	1.2	1.8	.6	1.9	.7	.6	.6
Oacoma	White River	02-27-89	06452000	Gann Valley	1.3	1.8	.5	1.9	.6	1.6	.3
Oacoma	White River	01-14-91	06452000	Gann Valley	1.3	1.6	.3	1.7	.4	2.1	.8
Oacoma	White River	01-08-93	06452000	Gann Valley	1.0	1.4	.4	1.5	.5	2.1	1.1
Oacoma	White River	01-24-94	06452000	Gann Valley	1.3	1.7	.4	1.8	.5	1.7	.4
Oacoma	White River	01-13-95	06452000	Gann Valley	1.0	1.3	.3	1.4	.4	1.5	.5
Scotland	James River	02-11-71	06478500	Yankton	1.1	1.8	.7	1.9	.8	1.9	.8
Scotland	James River	02-01-72	06478500	Yankton	1.1	1.6	.5	1.7	.6	1.5	.4
Scotland	James River	01-24-73	06478500	Yankton	1.3	1.4	.1	1.5	.2	1.3	.0
Scotland	James River	12-09-75	06478500	Yankton	1.2	.8	.4	.9	.3	.2	1.0
Scotland	James River	01-20-77	06478500	Yankton	1.1	1.6	.5	1.7	.6	2.3	1.2
Scotland	James River	01-30-78	06478500	Yankton	1.2	1.8	.6	1.9	.7	1.9	.7
Scotland	James River	01-22-79	06478500	Yankton	1.0	1.7	.7	1.8	.8	2.2	1.2
Scotland	James River	02-15-84	06478500	Yankton	1.5	1.8	.3	1.9	.4	.7	.8
Scotland	James River	03-14-84	06478500	Yankton	1.7	1.9	.2	2.0	.3	.7	1.0
Scotland	James River	01-06-86	06478500	Yankton	1.0	1.6	.6	1.7	.7	1.5	.5
Scotland	James River	02-18-88	06478500	Yankton	1.2	1.7	.5	1.8	.6	1.6	.4
Scotland	James River	01-14-94	06478500	Yankton	1.1	1.2	.1	1.3	.2	1.3	.2
Scotland	James River	01-09-96	06478500	Yankton	1.1	1.0	.1	1.1	.0	1.0	.1

Table 8. Comparison between equal or greater-than-1.0-foot measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Historical Data—Continued											
Scotland	James River	01-07-97	06478500	Yankton	1.6	1.4	0.2	1.5	0.1	1.5	0.1
Scotland	James River	03-04-97	06478500	Yankton	2.0	2.0	.0	2.1	.1	2.0	.0
Yankton	James River	02-02-82	06478513	Yankton	1.5	1.6	.1	1.8	.3	1.1	.4
Yankton	James River	01-05-84	06478513	Yankton	1.0	1.5	.5	1.6	.6	.5	.5
Yankton	James River	02-08-84	06478513	Yankton	1.3	1.8	.5	1.9	.6	.7	.6
Yankton	James River	03-08-84	06478513	Yankton	1.0	1.9	.9	2.0	1.0	.7	.3
Yankton	James River	02-20-85	06478513	Yankton	1.2	1.7	.5	1.8	.6	1.9	.7
Yankton	James River	02-16-88	06478513	Yankton	1.1	1.7	.6	1.8	.7	1.6	.5
Yankton	James River	01-31-95	06478513	Yankton	1.1	1.3	.2	1.4	.3	1.2	.1
Wakonda	Vermillion River	01-14-71	06479000	Yankton	2.0	1.4	.6	1.5	.5	1.1	.9
Wakonda	Vermillion River	02-11-72	06479000	Yankton	1.0	1.8	.8	1.9	.9	1.7	.7
Wakonda	Vermillion River	01-16-73	06479000	Yankton	1.2	1.4	.2	1.5	.3	1.3	.1
Wakonda	Vermillion River	02-13-73	06479000	Yankton	2.0	1.5	.5	1.6	.4	1.5	.5
Wakonda	Vermillion River	01-17-74	06479000	Yankton	1.3	1.5	.2	1.6	.3	1.3	.0
Wakonda	Vermillion River	01-22-75	06479000	Yankton	1.0	1.1	.1	1.2	.2	1.2	.2
Wakonda	Vermillion River	01-20-77	06479000	Yankton	1.4	1.6	.2	1.7	.3	2.3	.9
Wakonda	Vermillion River	01-23-79	06479000	Yankton	1.1	1.7	.6	1.8	.7	2.2	1.1
Wakonda	Vermillion River	02-18-81	06479000	Yankton	1.0	1.3	.3	1.4	.4	1.7	.7
Wakonda	Vermillion River	01-13-83	06479000	Yankton	2.0	.8	1.2	1.0	1.0	.2	1.8
Vermillion	Vermillion River	02-18-88	06479010	Yankton	1.2	1.7	.5	1.8	.6	1.6	.4
Vermillion	Vermillion River	12-28-89	06479010	Yankton	1.1	1.3	.2	1.4	.3	.9	.2
Vermillion	Vermillion River	02-06-91	06479010	Yankton	1.5	1.5	.0	1.6	.1	1.8	.3
Vermillion	Vermillion River	11-13-91	06479010	Yankton	1.2	.7	.5	.8	.4	.2	1.0

Table 8. Comparison between equal or greater-than-1.0-foot measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Historical Data—Continued											
Vermillion	Vermillion River	01-20-93	06479010	Yankton	1.2	1.4	0.2	1.4	0.2	1.5	0.3
Vermillion	Vermillion River	02-07-96	06479010	Yankton	1.2	1.5	.3	1.6	.4	1.9	.7
Brookings	Big Sioux River	02-02-71	06480000	Brookings	1.6	2.0	.4	2.1	.5	1.9	.3
Brookings	Big Sioux River	03-06-72	06480000	Brookings	1.5	2.4	.9	2.5	1.0	1.8	.3
Brookings	Big Sioux River	01-11-73	06480000	Brookings	1.3	1.6	.3	1.7	.4	2.0	.7
Brookings	Big Sioux River	02-12-74	06480000	Brookings	1.0	2.0	1.0	2.1	1.1	1.6	.6
Brookings	Big Sioux River	02-03-75	06480000	Brookings	1.7	1.6	.1	1.7	.0	1.6	.1
Brookings	Big Sioux River	03-04-75	06480000	Brookings	2.0	2.0	.0	2.1	.1	2.0	.0
Brookings	Big Sioux River	01-12-76	06480000	Brookings	1.4	1.6	.2	1.8	.4	.9	.5
Brookings	Big Sioux River	02-02-76	06480000	Brookings	1.5	1.9	.4	2.0	.5	1.0	.5
Brookings	Big Sioux River	03-01-76	06480000	Brookings	1.7	2.0	.3	2.1	.4	1.1	.6
Brookings	Big Sioux River	02-06-78	06480000	Brookings	2.0	2.3	.3	2.4	.4	2.3	.3
Brookings	Big Sioux River	03-07-78	06480000	Brookings	2.2	2.6	.4	2.8	.6	2.5	.3
Brookings	Big Sioux River	03-06-79	06480000	Brookings	1.8	2.7	.9	2.8	1.0	3.0	1.2
Brookings	Big Sioux River	02-13-80	06480000	Brookings	1.0	1.7	.7	1.8	.8	2.3	1.3
Brookings	Big Sioux River	12-27-83	06480000	Brookings	1.2	1.6	.4	1.7	.5	.6	.6
Brookings	Big Sioux River	02-08-84	06480000	Brookings	1.4	2.1	.7	2.2	.8	1.2	.2
Brookings	Big Sioux River	02-05-85	06480000	Brookings	1.2	1.9	.7	2.0	.8	2.4	1.2
Brookings	Big Sioux River	02-18-86	06480000	Brookings	1.6	2.3	.7	2.4	.8	1.4	.2
Brookings	Big Sioux River	02-24-88	06480000	Brookings	1.9	2.1	.2	2.3	.4	1.4	.5
Brookings	Big Sioux River	12-27-89	06480000	Brookings	1.0	1.5	.5	1.6	.6	2.2	1.2
Brookings	Big Sioux River	02-24-92	06480000	Brookings	1.5	1.6	.1	1.7	.2	2.0	.5
Brookings	Big Sioux River	03-25-92	06480000	Brookings	1.7	1.6	.1	1.7	.0	1.9	.2
Brookings	Big Sioux River	12-16-94	06480000	Brookings	2.0	.9	1.1	1.0	1.0	.7	1.3

Table 8. Comparison between equal or greater-than-1.0-foot measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Historical Data—Continued											
Dell Rapids	Big Sioux River	02-03-71	06481000	Sioux Falls	1.2	1.8	0.6	2.0	0.8	1.6	0.4
Dell Rapids	Big Sioux River	01-31-72	06481000	Sioux Falls	1.5	1.8	.3	1.9	.4	1.3	.2
Dell Rapids	Big Sioux River	01-11-73	06481000	Sioux Falls	1.2	1.5	.3	1.6	.4	1.8	.6
Dell Rapids	Big Sioux River	02-12-74	06481000	Sioux Falls	1.4	1.8	.4	1.9	.5	1.5	.1
Dell Rapids	Big Sioux River	03-03-75	06481000	Sioux Falls	1.2	1.8	.6	1.9	.7	1.8	.6
Dell Rapids	Big Sioux River	02-05-76	06481000	Sioux Falls	1.2	1.7	.5	1.8	.6	1.0	.2
Dell Rapids	Big Sioux River	02-19-76	06481000	Sioux Falls	1.6	1.7	.1	1.8	.2	1.0	.6
Dell Rapids	Big Sioux River	02-06-78	06481000	Sioux Falls	1.8	2.1	.3	2.2	.4	2.5	.7
Dell Rapids	Big Sioux River	03-03-78	06481000	Sioux Falls	2.1	2.4	.3	2.5	.4	2.7	.6
Dell Rapids	Big Sioux River	02-06-79	06481000	Sioux Falls	1.8	2.2	.4	2.3	.5	2.2	.4
Dell Rapids	Big Sioux River	02-12-80	06481000	Sioux Falls	1.2	1.6	.4	1.6	.4	1.9	.7
Dell Rapids	Big Sioux River	01-29-81	06481000	Sioux Falls	1.5	1.2	.3	1.3	.2	1.8	.3
Dell Rapids	Big Sioux River	01-25-83	06481000	Sioux Falls	1.2	1.2	.0	1.3	.1	.9	.3
Dell Rapids	Big Sioux River	02-13-84	06481000	Sioux Falls	1.4	2.0	.6	2.1	.7	1.0	.4
Dell Rapids	Big Sioux River	02-13-85	06481000	Sioux Falls	1.8	1.8	.0	1.9	.1	2.5	.7
Dell Rapids	Big Sioux River	02-20-86	06481000	Sioux Falls	1.9	2.1	.2	2.2	.3	1.2	.7
Dell Rapids	Big Sioux River	02-16-88	06481000	Sioux Falls	1.7	1.9	.2	2.0	.3	1.1	.6
Dell Rapids	Big Sioux River	03-01-93	06481000	Sioux Falls	1.4	1.9	.5	2.0	.6	1.7	.3
Dell Rapids	Big Sioux River	03-04-94	06481000	Sioux Falls	2.2	2.0	.2	2.1	.1	1.8	.4
Dell Rapids	Big Sioux River	02-06-96	06481000	Sioux Falls	1.6	1.7	.1	1.9	.3	2.0	.4
Dell Rapids	Big Sioux River	01-16-97	06481000	Sioux Falls	1.3	1.6	.3	1.7	.4	1.1	.2
				Average difference, in feet			.4		.4		.6
				Number of samples used in analysis			138		138		138
				Standard deviation			.3		.3		.4

Table 9. Comparison between equal or greater-than-1.5-foot measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Study-Collected Data											
Huron	James River	01-08-01	1	Huron	1.8	1.7	0.1	1.8	0.0	0.8	1.0
Huron	James River	02-12-01	1	Huron	2.3	2.1	.2	2.3	.0	1.1	1.2
Huron	James River	04-02-01	1	Huron	2.2	2.5	.3	2.6	.4	1.2	1.0
Scotland	James River	02-12-01	2	Yankton	1.7	1.9	.2	2.0	.3	1.2	.5
Scotland	James River	03-20-01	2	Yankton	1.6	2.1	.5	2.2	.6	1.3	.3
Oacoma	White River	01-10-01	3	Gann Valley	1.5	1.7	.2	1.8	.3	2.5	1.0
near Mobridge	Oahe Res.	02-12-99	5	Eureka	1.8	1.7	.1	1.8	.0	2.0	.2
near Mobridge	Oahe Res.	01-11-01	5	Eureka	1.8	1.9	.1	1.9	.1	1.8	.0
near Mobridge	Oahe Res.	02-14-01	5	Eureka	2.2	2.2	.0	2.4	.2	2.3	.1
Platte-Winner	Lake Francis Case	01-09-01	6	Academy	1.6	1.6	.0	1.7	.1	.6	1.0
Platte-Winner	Lake Francis Case	02-13-01	6	Academy	1.8	1.9	.1	2.0	.2	.8	1.0
Little Eagle	Grand River	12-19-77	06357800	Mobridge	1.5	1.2	.3	1.2	.3	.4	1.1
Little Eagle	Grand River	02-06-85	06357800	Mobridge	1.9	2.0	.1	2.1	.2	2.2	.3
Little Eagle	Grand River	01-20-86	06357800	Mobridge	1.7	1.8	.1	1.9	.2	.6	1.1
Little Eagle	Grand River	02-20-86	06357800	Mobridge	2.4	2.2	.2	2.3	.1	.9	1.5
Little Eagle	Grand River	02-10-88	06357800	Mobridge	2.9	1.6	1.3	1.7	1.2	1.8	1.1
Little Eagle	Grand River	01-24-96	06357800	Mobridge	1.8	1.5	.3	1.6	.2	1.7	.1
Little Eagle	Grand River	01-21-97	06357800	Mobridge	1.7	2.0	.3	2.1	.4	.8	.9
Little Eagle	Grand River	02-27-97	06357800	Mobridge	2.1	2.3	.2	2.5	.4	.8	1.3
Historical Data											
Oacoma	White River	01-29-76	06452000	Gann Valley	1.5	1.5	.0	1.6	.1	1.7	.2

Table 9. Comparison between equal or greater-than-1.5-foot measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Historical Data—Continued											
Oacoma	White River	01-27-77	06452000	Gann Valley	1.8	1.7	0.1	1.9	0.1	2.4	0.6
Oacoma	White River	02-05-79	06452000	Gann Valley	2.2	2.1	.1	2.2	.0	2.5	.3
Oacoma	White River	03-05-79	06452000	Gann Valley	2.3	2.4	.1	2.5	.2	2.8	.5
Oacoma	White River	03-03-80	06452000	Gann Valley	1.7	1.5	.2	1.6	.1	2.2	.5
Oacoma	White River	02-17-81	06452000	Gann Valley	2.0	1.3	.7	1.4	.6	1.7	.3
Oacoma	White River	02-21-85	06452000	Gann Valley	1.8	1.9	.1	2.1	.3	2.1	.3
			06452000								
Scotland	James River	02-15-84	06478500	Yankton	1.5	1.8	.3	1.9	.4	.7	.8
Scotland	James River	03-14-84	06478500	Yankton	1.7	1.9	.2	2.0	.3	.7	1.0
Scotland	James River	01-07-97	06478500	Yankton	1.6	1.4	.2	1.5	.1	1.5	.1
Scotland	James River	03-04-97	06478500	Yankton	2.0	2.0	.0	2.1	.1	2.0	.0
Yankton	James River	02-02-82	06478513	Yankton	1.5	1.6	.1	1.8	.3	1.1	.4
Wakonda	Vermillion River	01-14-71	06479000	Yankton	2.0	1.4	.6	1.5	.5	1.1	.9
Wakonda	Vermillion River	02-13-73	06479000	Yankton	2.0	1.5	.5	1.6	.4	1.5	.5
Wakonda	Vermillion River	01-13-83	06479000	Yankton	2.0	.8	1.2	1.0	1.0	.2	1.8
Vermillion	Vermillion River	02-06-91	06479010	Yankton	1.5	1.5	.0	1.6	.1	1.8	.3
Brookings	Big Sioux River	02-02-71	06480000	Brookings	1.6	2.0	.4	2.1	.5	1.9	.3
Brookings	Big Sioux River	03-06-72	06480000	Brookings	1.5	2.4	.9	2.5	1.0	1.8	.3
Brookings	Big Sioux River	02-03-75	06480000	Brookings	1.7	1.6	.1	1.7	.0	1.6	.1
Brookings	Big Sioux River	03-04-75	06480000	Brookings	2.0	2.0	.0	2.1	.1	2.0	.0
Brookings	Big Sioux River	02-02-76	06480000	Brookings	1.5	1.9	.4	2.0	.5	1.0	.5
Brookings	Big Sioux River	03-01-76	06480000	Brookings	1.7	2.0	.3	2.1	.4	1.1	.6

Table 9. Comparison between equal or greater-than-1.5-foot measured and equation-estimated ice thickness at selected sites in South Dakota using both study-collected and historical ice-thickness data–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day, Incremental Accumulative Freezing Degree Day, and Simplified Energy Budget equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site or USGS streamflow-gaging station number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2		Equation 3	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Historical Data—Continued											
Brookings	Big Sioux River	02-06-78	06480000	Brookings	2.0	2.3	0.3	2.4	0.4	2.3	0.3
Brookings	Big Sioux River	03-07-78	06480000	Brookings	2.2	2.6	.4	2.8	.6	2.5	.3
Brookings	Big Sioux River	03-06-79	06480000	Brookings	1.8	2.7	.9	2.8	1.0	3.0	1.2
Brookings	Big Sioux River	02-18-86	06480000	Brookings	1.6	2.3	.7	2.4	.8	1.4	.2
Brookings	Big Sioux River	02-24-88	06480000	Brookings	1.9	2.1	.2	2.3	.4	1.4	.5
Brookings	Big Sioux River	02-24-92	06480000	Brookings	1.5	1.6	.1	1.7	.2	2.0	.5
Brookings	Big Sioux River	03-25-92	06480000	Brookings	1.7	1.6	.1	1.7	.0	1.9	.2
Brookings	Big Sioux River	12-16-94	06480000	Brookings	2.0	.9	1.1	1.0	1.0	.7	1.3
Dell Rapids	Big Sioux River	01-31-72	06481000	Sioux Falls	1.5	1.8	.3	1.9	.4	1.3	.2
Dell Rapids	Big Sioux River	02-19-76	06481000	Sioux Falls	1.6	1.7	.1	1.8	.2	1.0	.6
Dell Rapids	Big Sioux River	02-06-78	06481000	Sioux Falls	1.8	2.1	.3	2.2	.4	2.5	.7
Dell Rapids	Big Sioux River	03-03-78	06481000	Sioux Falls	2.1	2.4	.3	2.5	.4	2.7	.6
Dell Rapids	Big Sioux River	02-06-79	06481000	Sioux Falls	1.8	2.2	.4	2.3	.5	2.2	.4
Dell Rapids	Big Sioux River	01-29-81	06481000	Sioux Falls	1.5	1.2	.3	1.3	.2	1.8	.3
Dell Rapids	Big Sioux River	02-13-85	06481000	Sioux Falls	1.8	1.8	.0	1.9	.1	2.5	.7
Dell Rapids	Big Sioux River	02-20-86	06481000	Sioux Falls	1.9	2.1	.2	2.2	.3	1.2	.7
Dell Rapids	Big Sioux River	02-16-88	06481000	Sioux Falls	1.7	1.9	.2	2.0	.3	1.1	.6
Dell Rapids	Big Sioux River	03-04-94	06481000	Sioux Falls	2.2	2.0	.2	2.1	.1	1.8	.4
Dell Rapids	Big Sioux River	02-06-96	06481000	Sioux Falls	1.6	1.7	.1	1.9	.3	2.0	.4
				Average difference, in feet			.3		.3		.6
				Number of samples used in analysis			60		60		60
				Standard deviation			.3		.3		.4

Table 10. Comparison between measured and equation-estimated ice thickness at selected sites in South Dakota using only study-collected ice-thickness data using an α coefficient of 0.55

[Equations 1 and 2 are the Accumulative Freezing Degree Day and Incremental Accumulative Freezing Degree Day equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
Huron	James River	02-06-99	1	Huron	1.3	1.3	0.0	1.4	0.1
Huron	James River	01-20-00	1	Huron	1.2	.9	.3	1.0	.2
Huron	James River	02-24-00	1	Huron	1.3	1.1	.2	1.2	.1
Huron	James River	01-08-01	1	Huron	1.8	1.6	.2	1.7	.1
Huron	James River	02-12-01	1	Huron	2.3	1.9	.4	2.1	.2
Huron	James River	04-02-01	1	Huron	2.2	2.3	.1	2.4	.2
Scotland	James River	02-11-99	2	Yankton	.9	1.1	.2	1.2	.3
Scotland	James River	01-24-00	2	Yankton	1.0	.8	.2	.9	.1
Scotland	James River	01-09-01	2	Yankton	1.4	1.4	.0	1.5	.1
Scotland	James River	02-12-01	2	Yankton	1.7	1.7	.0	1.8	.1
Scotland	James River	03-20-01	2	Yankton	1.6	1.9	.3	2.1	.5
Presho	White River	01-28-00	3	Gann Valley	1.0	1.0	.0	1.1	.1
Oacoma	White River	02-24-00	3	Gann Valley	.9	1.2	.3	1.3	.4
Oacoma	White River	01-10-01	3	Gann Valley	1.5	1.6	.1	1.7	.2
Oacoma	White River	03-13-01	3	Gann Valley	1.2	1.1	.1	1.2	.0
Little Eagle	Grand River	02-12-99	4	Eureka	1.2	1.5	.3	1.6	.4
Little Eagle	Grand River	01-25-00	4	Eureka	1.2	1.2	.0	1.2	.0
Little Eagle	Grand River	02-25-00	4	Eureka	.8	1.4	.6	1.5	.7
Little Eagle	Grand River	03-14-01	4	Eureka	1.4	1.1	.3	1.2	.2

Table 10. Comparison between measured and equation-estimated ice thickness at selected sites in South Dakota using only study-collected ice-thickness data using an α coefficient of 0.55–Continued

[Equations 1 and 2 are the Accumulative Freezing Degree Day and Incremental Accumulative Freezing Degree Day equations, respectively; USGS, U.S. Geological Survey; NWS, National Weather Service; Diff, absolute difference between measured and estimated]

Location	Water body	Date	Site number	NWS station	Measured maximum ice thickness (feet)	Equation 1		Equation 2	
						Estimated ice thickness (feet)	Diff (feet)	Estimated ice thickness (feet)	Diff (feet)
near Mobridge	Oahe Reservoir	02-12-99	5	Eureka	1.8	1.5	0.3	1.6	0.2
near Mobridge	Oahe Reservoir	01-25-00	5	Eureka	1.0	1.2	.2	1.2	.2
near Mobridge	Oahe Reservoir	02-25-00	5	Eureka	1.2	1.4	.2	1.5	.3
near Mobridge	Oahe Reservoir	01-11-01	5	Eureka	1.8	1.7	.1	1.8	.0
near Mobridge	Oahe Reservoir	02-14-01	5	Eureka	2.2	2.0	.2	2.2	.0
Platte-Winner	Lake Francis Case	01-09-01	6	Academy	1.6	1.5	.1	1.6	.0
Platte-Winner	Lake Francis Case	02-13-01	6	Academy	1.8	1.8	.0	1.9	.1
				Average difference, in feet			.2		.2
				Number of samples used in analysis			26		26
				Standard deviation			.2		.2

Table 11. Estimated maximum potential ice thickness using three equations at selected sites in South Dakota

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day equation; Incremental Accumulative Freezing Degree Day; and Simplified Energy Budget equations, respectively; NWS, National Weather Service; NE, Northeast; E, East; N, North; NW, Northwest]

NWS station name	NWS station number	For ice formation		Winter	NWS coldest winter rank	Ice thickness (feet)			Equation 1 estimated maximum potential ice thickness (feet)
		Begin date[1]	End date			Equation 1	Equation 2	Equation 3	
Aberdeen Regional Airport	390020	11-21-71	03-10-72	1972	12	2.4	2.5	1.5	2.8
Aberdeen Regional Airport	390020	11-09-77	03-20-78	1978	2	2.7	2.9	1.9	
Aberdeen Regional Airport	390020	11-10-78	03-31-79	1979	1	2.8	2.9	2.3	
Aberdeen Regional Airport	390020	10-30-96	03-20-97	1997	9	2.7	2.8	1.3	
Academy 2 NE	390043	11-28-71	03-05-72	1972	12	1.7	1.8	2.1	2.2
Academy 2 NE	390043	11-20-77	03-08-78	1978	2	2.2	2.4	1.9	
Academy 2 NE	390043	11-11-78	12-04-79	1979	1	2.2	2.3	2.5	
Academy 2 NE	390043	12-08-16	03-18-17	1917	3	2.1	2.2	2.5	
Britton	391047	10-31-35	03-07-36	1936	4	2.8	3.0	3.0	2.8
Britton	391047	11-18-71	03-10-72	1972	12	2.5	2.6	.9	
Britton	391047	11-10-77	03-19-78	1978	2	2.7	2.8	1.0	
Britton	391047	11-11-78	03-31-79	1979	1	2.8	3.0	1.9	
Brookings 2 NE	391076	11-18-71	03-13-72	1972	12	2.4	2.6	1.8	2.8
Brookings 2 NE	391076	11-11-77	03-18-78	1978	2	2.7	2.8	2.6	
Brookings 2 NE	391076	11-11-78	03-31-79	1979	1	2.8	2.9	3.1	
Brookings 2 NE	391076	11-09-96	03-20-97	1997	9	2.6	2.7	1.6	
Camp Crook	391294	11-20-71	03-05-72	1972	12	2.0	2.1	1.5	2.5
Camp Crook	391294	11-10-78	03-26-79	1979	1	2.5	2.7	1.7	

Table 11. Estimated maximum potential ice thickness using three equations at selected sites in South Dakota–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day equation; Incremental Accumulative Freezing Degree Day; and Simplified Energy Budget equations, respectively; NWS, National Weather Service; NE, Northeast; E, East; N, North; NW, Northwest]

NWS station name	NWS station number	For ice formation		Winter	NWS coldest winter rank	Ice thickness (feet)			Equation 1 estimated maximum potential ice thickness (feet)
		Begin date[1]	End date			Equation 1	Equation 2	Equation 3	
Cottonwood 2 E	391972	11-28-71	02-26-72	1972	12	1.7	1.8	1.8	2.4
Cottonwood 2 E	391972	11-20-77	03-09-78	1978	2	2.0	2.1	1.1	
Cottonwood 2 E	391972	11-11-78	03-11-79	1979	1	2.4	2.5	2.2	
Cottonwood 2 E	391972	12-07-16	03-20-17	1917	3	2.1	2.2	2.4	
Eureka	392797	10-31-35	03-06-36	1936	4	2.8	3.0	3.3	2.8
Eureka	392797	11-10-78	03-31-79	1979	1	2.8	3.0	2.7	
Eureka	392797	11-05-96	03-19-97	1997	9	2.7	2.8	.7	
Fairfax	392820	12-01-35	03-01-36	1936	4	2.3	2.4	2.1	2.3
Fairfax	392820	12-07-16	03-19-17	1917	3	2.2	2.3	2.5	
Faith	392852	11-19-77	03-17-78	1978	2	2.4	2.6	1.2	2.5
Faith	392852	11-10-78	03-10-79	1979	1	2.5	2.7	1.7	
Faith	392852	11-08-96	03-15-97	1997	9	2.2	2.3	1.0	
Faulkton 1 NW	392927	11-18-71	03-09-72	1972	12	2.3	2.4	1.3	2.6
Faulkton 1 NW	392927	11-09-77	03-19-78	1978	2	2.6	2.6	2.3	
Hot Springs	394007	12-14-35	02-21-36	1936	4	1.7	1.8	1.2	2.0
Hot Springs	394007	11-26-71	02-11-72	1972	12	1.3	1.4	1.5	
Hot Springs	394007	11-19-77	03-07-78	1978	2	1.8	2.0	1.9	
Hot Springs	394007	11-10-78	03-04-79	1979	1	2.0	2.1	2.2	

Table 11. Estimated maximum potential ice thickness using three equations at selected sites in South Dakota–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day equation; Incremental Accumulative Freezing Degree Day; and Simplified Energy Budget equations, respectively; NWS, National Weather Service; NE, Northeast; E, East; N, North; NW, Northwest]

NWS station name	NWS station number	For ice formation		Winter	NWS coldest winter rank	Ice thickness (feet)			Equation 1 estimated maximum potential ice thickness (feet)
		Begin date[1]	End date			Equation 1	Equation 2	Equation 3	
Huron Regional Airport	394127	12-01-35	03-01-36	1936	4	2.5	2.6	2.4	2.5
Huron Regional Airport	394127	11-29-71	03-09-72	1972	12	2.2	2.3	1.4	
Huron Regional Airport	394127	11-20-77	03-17-78	1978	2	2.5	2.7	3.1	
Huron Regional Airport	394127	11-10-78	03-11-79	1979	1	2.5	2.7	2.4	
Huron Regional Airport	394127	12-07-16	03-20-17	1917	3	2.4	2.5	2.7	
Mitchell 2 N	395671	12-01-35	03-01-36	1936	4	2.4	2.5	2.0	2.4
Mitchell 2 N	395671	11-27-71	03-05-72	1972	12	2.0	2.1	2.1	
Mitchell 2 N	395671	11-08-98	03-31-99	1899	7	2.3	2.1	3.2	
Pierre Municipal Airport	396597	11-28-71	03-08-72	1972	12	2.1	2.2	2.5	2.4
Pierre Municipal Airport	396597	11-18-77	03-17-78	1978	2	2.4	2.5	2.1	
Pierre Municipal Airport	396597	11-10-78	03-05-79	1979	1	2.4	2.5	3.5	
Pierre Municipal Airport	396597	11-09-96	03-15-97	1997	9	2.2	2.3	1.4	
Rapid City Regional Airport	396937	11-27-71	03-04-72	1972	12	1.6	1.7	2.2	2.1
Rapid City Regional Airport	396937	11-19-77	03-08-78	1978	2	2.1	2.2	2.3	
Rapid City Regional Airport	396937	11-10-78	03-04-79	1979	1	2.0	2.2	2.0	
Sioux Falls Foss Field	397667	11-25-71	03-09-72	1972	12	2.2	2.3	1.7	2.5
Sioux Falls Foss Field	397667	11-20-77	03-17-78	1978	2	2.4	2.6	2.8	
Sioux Falls Foss Field	397667	11-14-78	03-15-79	1979	1	2.5	2.6	2.4	
Sioux Falls Foss Field	397667	11-08-96	03-18-97	1997	9	2.4	2.5	1.5	

Table 11. Estimated maximum potential ice thickness using three equations at selected sites in South Dakota–Continued

[Equations 1, 2, and 3 are the Accumulative Freezing Degree Day equation; Incremental Accumulative Freezing Degree Day; and Simplified Energy Budget equations, respectively; NWS, National Weather Service; NE, Northeast; E, East; N, North; NW, Northwest]

NWS station name	NWS station number	For ice formation		Winter	NWS coldest winter rank	Ice thickness (feet)			Equation 1 estimated maximum potential ice thickness (feet)
		Begin date[1]	End date			Equation 1	Equation 2	Equation 3	
Sisseton	397742	11-18-71	03-10-72	1972	12	2.3	2.4	1.5	2.7
Sisseton	397742	11-09-77	03-17-78	1978	2	2.6	2.7	.9	
Sisseton	397742	11-11-78	03-31-79	1979	1	2.7	2.9	2.1	
Watertown Municipal Airport	398932	11-18-71	03-10-72	1972	12	2.4	2.6	2.0	2.7
Watertown Municipal Airport	398932	11-09-77	03-25-78	1978	2	2.7	2.9	1.6	
Watertown Municipal Airport	398932	11-12-78	03-31-79	1979	1	2.7	2.9	2.4	
Yankton 2 E	399502	12-11-35	03-01-36	1936	4	2.3	2.4	2.0	2.3
Yankton 2 E	399502	11-30-71	03-06-72	1972	12	1.9	2.0	2.0	
Yankton 2 E	399502	12-02-77	03-09-78	1978	2	2.3	2.4	2.0	
Yankton 2 E	399502	11-19-78	03-12-79	1979	1	2.3	2.5	2.7	

[1]Beginning of ice formation based on average daily temperatures as reported by the NWS.