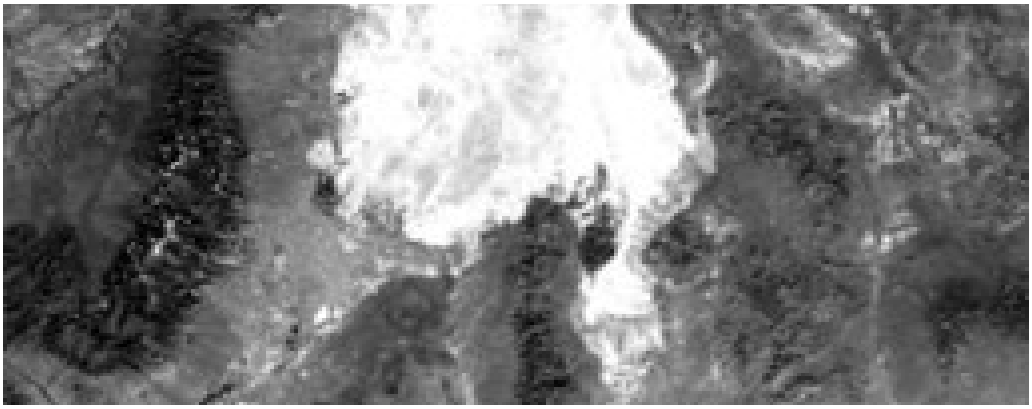
Image extracted from: W.W. White, III. 2002. Salt Laydown Project - Replenishment of Salt to the Bonneville Salt Flats. Pages 433 - 486 in J. Wallace Gwynn, ed., Great Salt Lake: An Overview of Change. Special Publication of the Utah Department of Natural Resources.
Document downloaded November 14, 2006 from BLM website (www.ut.blm.gc

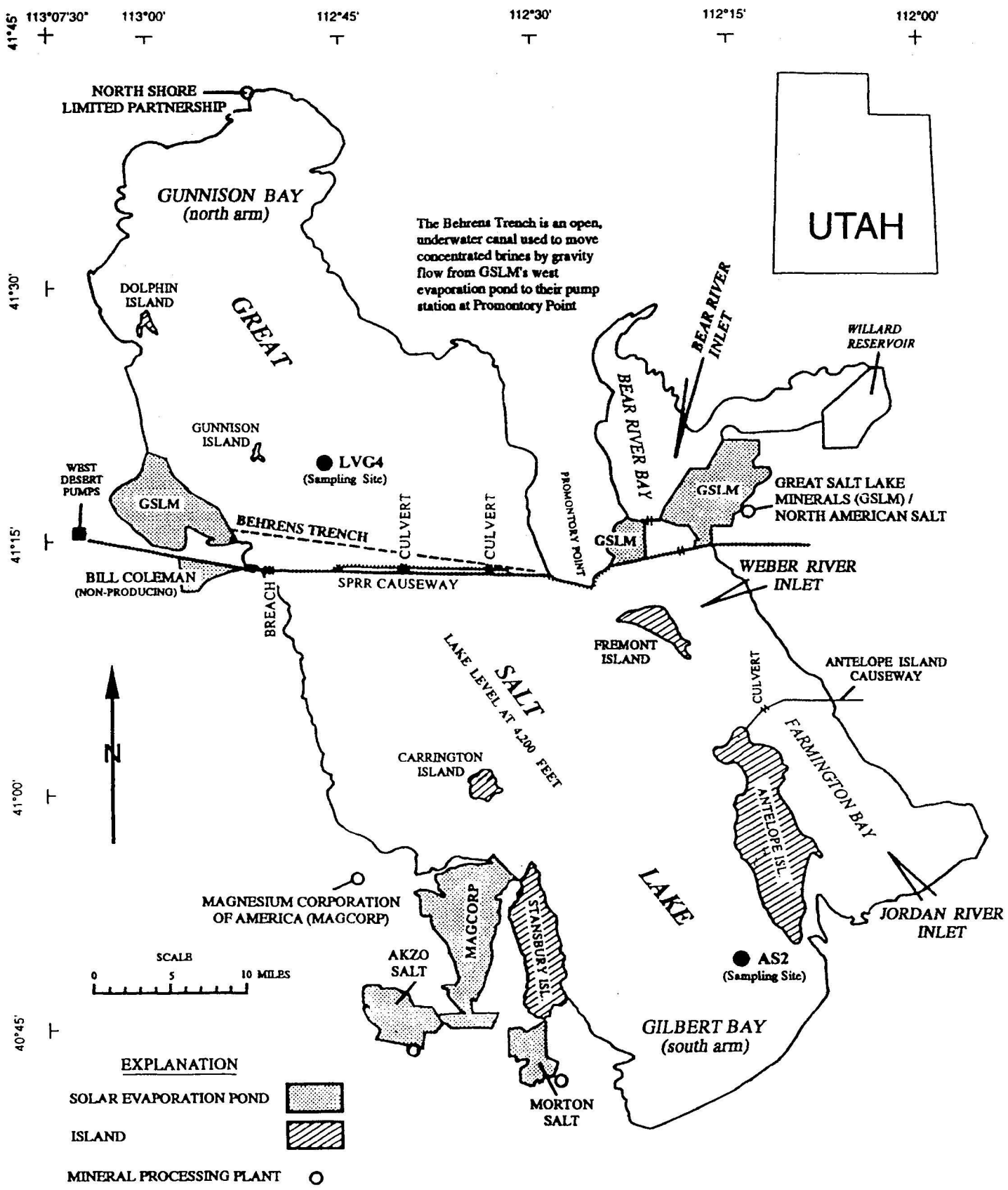
<---------- approximately 45 miles ----------> (Wendover to bend in I-80)

^
approximately 116 miles



<---------- approximately 45 miles ---------->
(Wendover to bend in I-80)

|
|
|
|
|
|
V



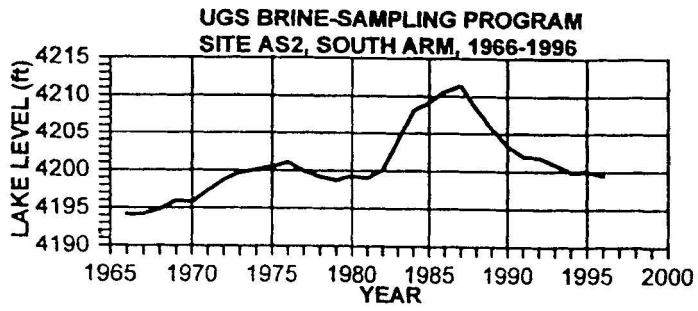
Public Information Series 51
Utah Geological Survey
a division of
Utah Department of Natural Resources

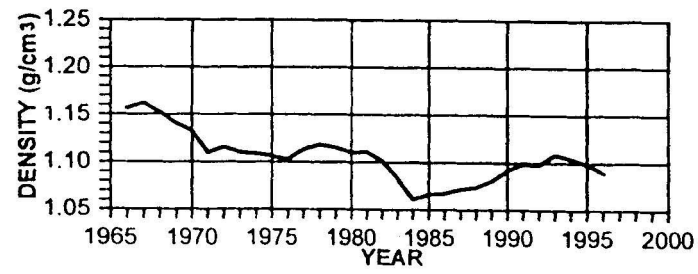
BRINE PROPERTIES, MINERAL EXTRACTION INDUSTRIES, AND SALT LOAD OF GREAT SALT LAKE, UTAH

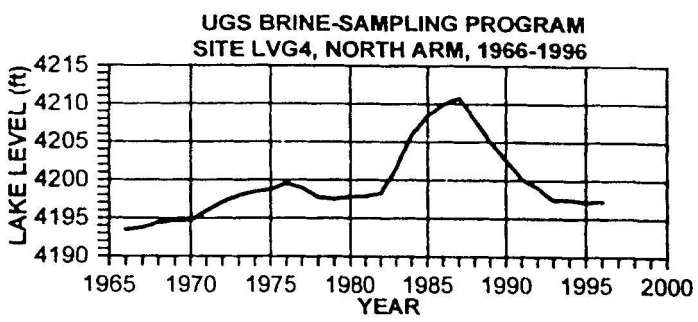
J. Wallace Gwynn - 1997

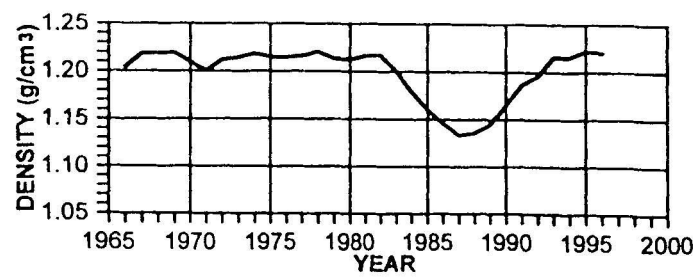
WATER DENSITY VERSUS LAKE ELEVATION

The graphs show average yearly lake elevation (feet above mean sea level) and water density (g/cm^3), a measure of salinity or salt content, for the south (site AS2) and north (site LVG4) arms of the lake from 1984 through 1996 (see map). The density of the south arm, which is fed by fresh-water tributaries, varies inversely with lake elevation. The north arm, which is fed by salty south-arm water, is more saline and less influenced by lake level. Farmington and Bear River Bays are much less saline than either the north or south arms of the lake.









WATER CHEMISTRY

Water chemistry, or the relative abundance of dissolved ions (dry-weight basis), remains relatively constant throughout both arms of the lake.

Table 1 shows the composition of dissolved salts in Great Salt Lake compared with the ocean (average composition), the Dead Sea, and Sevier Lake (Millard County, Utah).

Table 1. Comparison of different water chemistries

ION	GREAT SALT LAKE	OCEAN	DEAD SEA	SEVIER LAKE UTAH
Sodium	32.1	30.8	12.3	35.5
Potassium	2.3	1.1	2.3	1.4
Magnesium	3.7	3.7	12.8	1.6
Calcium	0.3	1.2	5.2	0.2
Chloride	54.0	55.5	67.1	49.1
Sulfate	7.6	7.7	0.1	12.1

MINERAL-EXTRACTION INDUSTRIES

Six mineral-extraction industries currently operate on Great Salt Lake (table 2). Cumulatively, these industries produced nearly 2.8 million tons of products during 1995, valued at about $300 million.

Table 2. Active mineral extraction industries

INDUSTRY	PRODUCT(S)
Magnesium Corporation of America (MAGCORP)	Primary magnesium metal, alloys, and chlorine gas
AKZO Salt Company	Sodium chloride products
Morton Salt Company	Sodium chloride products
Great Salt Lake Minerals Corporation (GSLM)	Potassium sulfate (fertilizer), magnesium chloride products
North American Salt Company	Sodium chloride products
North Shore Ltd. Partnership/ Mineral Resources International	Concentrated brines/ processed into dietary supplements

SALT LOAD AND POTENTIAL RESOURCES

Great Salt Lake contains about 4.5 billion tons of salt. Major changes in lake conditions, such as the 1980s flooding, breaching the Southern Pacific Railroad (SPRR) causeway in 1984, and West Desert pumping in 1987, have altered the balance of salt between the two arms. Raising the SPRR causeway during the 1980s reduced the permeability of the causeway and the bi-directional transfer of brines between the southern and northern arms. Because of this, there has been a constant loss of salt from the south arm of the lake to the north arm since 1994. The reduction in salinity is of great concern to the south-arm mineral-extraction industries and to the lake's multi-million dollar brine shrimp industry.

A buried, wedge-shaped body of natural sodium sulfate (mirabilite) extends westward from Promontory Point, beneath the SPRR causeway. Sodium sulfate is found cementing the near-shore sediments at shallow depths at numerous locations around the perimeter of the lake.

Information Sheet 51 downloaded November 18, 2006 from: http://geology.utah.gov/utahgeo/gsl/index.htm

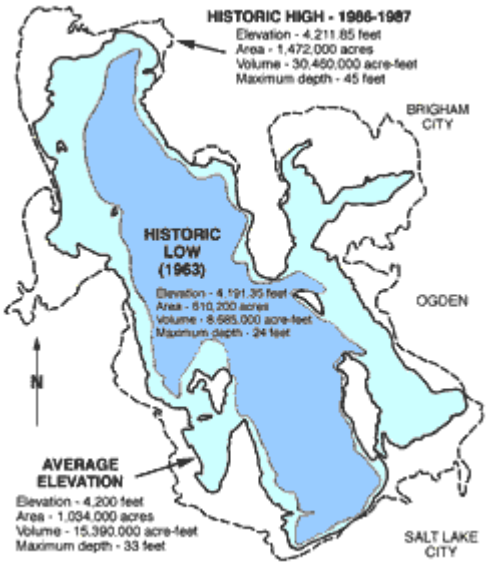
Great Salt Lake

PI-39 Commonly Asked Questions About Utah's Great Salt Lake and Ancient Lake Bonneville

How big and how deep is the lake, and why does it change in size?

Great Salt Lake averages approximately 75 miles long by 35 miles wide at a surface elevation of about 4,200 feet. At this elevation, the lake covers an area of 1,034,000 acres, and has a maximum depth of about 33 feet.

It is reported to be the 33rd largest lake in the world, and the largest fresh or saltwater lake in the United States after the Great Lakes. Its size and depth, however, vary both seasonally and over the long term. The magnitude of these changes depends on the balance between the total amount of water that enters the lake and that which leaves.

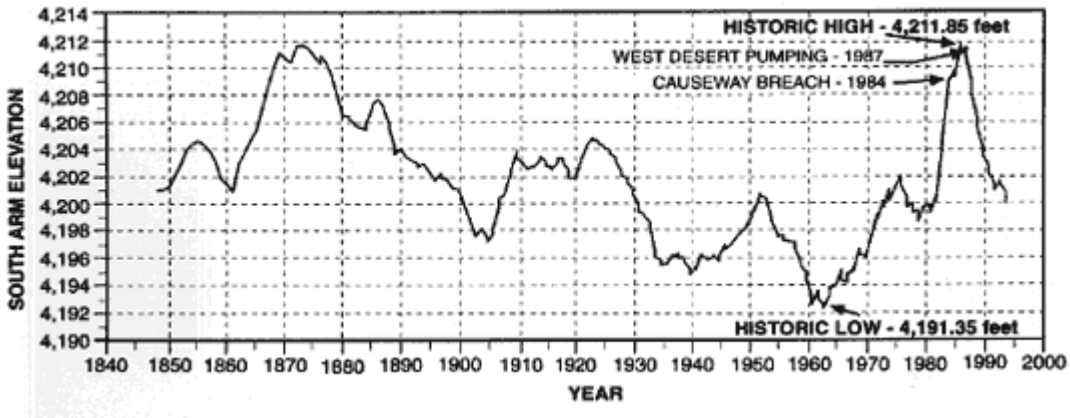


Areal extent, elevation, volume, and maximum depth of Great Salt Lake at historic high, average, and historic low-water levels.

On average, the lake level fluctuates one to two feet annually, rising to its highest level during May through July (following the melting of the mountain snowpack) and dropping to its lowest point during October through November (after the hot summer months).

In historical time (1847 to present), fluctuations of the lake level have varied over a range of 20 feet from a low of 4,191.35 feet in 1963 to a high of 4,211.85 feet in 1986-1987. The historical average elevation of the lake is about 4,200 feet.

Because of the very shallow nature of the lake, even modest changes in its elevation result in relatively large changes in the lake's area and volume. The accompanying map shows the high, average, and low elevations of the lake and pertinent information for each of these elevations.



Historical elevations (in feet above mean sea level) of the southern arm of the Great Salt Lake (at its highest point for the year), 1847-1994 (USGS provisional lake records).

HOME TOC BACK NEXT

1594 W. North Temple, PO 146100, Salt Lake City, UT 84114-6100, 801.537.3300, Fax 801.537.3400
DNR | Utah.gov | Contact | Disclaimer | Privacy Policy | Accessibility Policy

Copyright © 2005 State of Utah

Great Salt Lake

PI-39 Commonly Asked Questions About Utah's Great Salt Lake and Ancient Lake Bonneville

How much salt is in Great Salt Lake, and why does the salinity vary?

The total amount of salt dissolved in Great Salt Lake is about 4.5 to 4.9 billion tons. As the lake rises, its salinity drops because the same amount of salt is dissolved in more water. The lower the lake level, the saltier the lake becomes. In historical time, the lake's salinity has ranged from a little less than 5 percent, (just above that of sea water), to nearly 27 percent (beyond which water cannot hold more salt).

Can I float in Great Salt Lake?

You can easily float in Great Salt Lake if the water is salty enough. At the lake's average elevation of 4,200 feet, the south arm of the lake contains about 13 percent salt, which makes it salty enough for most people to float with little effort. When the lake is higher than 4,200 feet, it is less salty and therefore less buoyant. Swimmers float easily in the north arm because it is twice as salty as the south arm.

What is the chemical composition of Great Salt Lake?

The chemical composition of Great Salt Lake is similar to that of typical ocean water. Sodium and chloride are the major ions in the water, followed by sulfate, magnesium, calcium, and potassium. For comparison, the table below shows the concentration of the six major ions in water of Great Salt Lake, a typical ocean, and the Dead Sea.

Chemical compositions (dry weight percents) of Great Salt Lake, typical ocean, and the Dead Sea waters.

Source	Sodium	Potassium	Magnesium	Calcium	Chloride	Sulfate
Great Salt Lake	32.8	2.0	3.3	0.2	54.5	7.2
Ocean (typical)	30.8	1.1	3.7	1.2	55.5	7.7
Dead Sea	12.3	2.3	12.8	5.3	67.2	0.1

1594 W. North Temple, PO 146100, Salt Lake City, UT 84114-6100, 801.537.3300, Fax 801.537.3400
DNR | Utah.gov | Contact | Disclaimer | Privacy Policy | Accessibility Policy

Copyright © 2005 State of Utah

Great Salt Lake

PI-39 Commonly Asked Questions About Utah's Great Salt Lake and Ancient Lake Bonneville

What minerals are produced from Great Salt Lake? How and by whom are they recovered?

In 1995, five mineral-extraction companies operated near the lake. These companies used solar evaporation to concentrate the lake waters to produce either salts or highly concentrated brine (water with high salt content) products. These companies paid a royalty to the State of Utah (owner of the lake), on the salts and other materials produced and sold.

Sodium chloride (common salt) is produced by: (1) evaporating the water in shallow ponds that cover many thousands of acres, (2) precipitating the salt, and (3) harvesting it from the bottom of the ponds.The collected salt is rinsed, washed, dried, and screened to produce different product sizes and grades.

Common salt is also pressed into pellets for use in water softeners, and formed into salt-lick blocks (some with added minerals) for livestock consumption. Large quantities of bulk salt are shipped out-of-state for use in industry. Much of the salt is used locally for melting ice on roadways.

Harvesting potassium-bearing salts from large solar-evaporation pond. Salts will by processed into potassium sulfate, a mineral fertilizer.

Food-grade, or table salt is not produced from the lake, because its purity cannot be guaranteed without additional, costly processing. The table salt used in Utah comes from salt-processing facilities in New York, Ohio, Kansas, Louisiana, Texas, or California.

Great Salt Lake also yields salt products other than common salt. The salt industry produces potassium sulfate, a commercial fertilizer derived from potassium and magnesium salts.

Magnesium-chloride brine is used in the production of magnesium metal and chlorine gas and as a dust suppressant. The production of these salts and highly concentrated brines requires additional evaporation beyond that needed to precipitate common salt. These products also require complex chemical processing.

Mirabilite, a hydrated sodium-sulfate salt, commonly used in the production of sodium sulfate or salt cake, precipitates from concentrated lake water only during the cold winter months.

The table below lists the names of the five salt companies that operated on the Great Salt Lake and the products they produced.

Companies extracting mineral products from the Great Salt Lake, and their products (1995).

COMPANY	PRODUCTS
AKZO Salt of Utah	Sodium chloride
Great Salt Lake Minerals Corp.	Potassium sulfate and magnesium chloride products
Magnesium Corporation of America	Magnesium metal, chlorine gas
Morton Salt Company	Sodium chloride
North American Salt Company	Sodium chloride

HOME TOC BACK NEXT

1594 W. North Temple, PO 146100, Salt Lake City, UT 84114-6100, 801.537.3300, Fax 801.537.3400
DNR | Utah.gov | Contact | Disclaimer | Privacy Policy | Accessibility Policy

Copyright © 2005 State of Utah

Excerpt from: Whelan, J. A. and Carol A. Petersen. 1975. Great Salt Lake, Utah: Chemical and Physical Variations of the Brine, Water Year 1973. Utah Geological and Mineral Survey. Water-Resource Bulletin 20.
Document downloaded December 7, 2006 from Utah Department of Natural Resources Library website (www.dnrlibrary.utah.gov).

Table 2. Composition of dissolved solids in the three brine types of Great Salt Lake for various years.
[computed in weight-percent]

	South arm shallow brines					South arm deep brines			North arm brines			
	March 1930[1] d<20 ft.	April 1960[2] d<20 ft.	1966[3] d<20 ft.	1972[3] d<20 ft.	WY 1973 d<20 ft.	1966[3] d>20 ft.	1972[3] d>20 ft.	WY 1973 d>20 ft.	December 1963[4]	1966	1972	WY 1973
Cl^-	57.05	55.88	55.02	55.56	55.26	55.51	55.20	55.05	56.04	52.98	56.17	55.97
Mg^{++}	2.75	2.91	3.53	3.54	3.81	3.57	3.71	4.03	4.66	4.10	3.72	3.95
Ca^{++}	0.17	0.12	0.15	0.12	0.22	0.12	0.08	0.04	0.09	0.11	0.05	0.08
Na^+	32.90	32.71	31.54	30.36	30.61	30.95	30.27	31.35	29.08	31.59	29.20	30.41
K^+	1.61	1.71	2.35	2.64	2.47	2.26	2.69	2.51	2.75	2.79	2.95	2.65
$SO_4^=$	5.47	6.60	7.35	7.69	7.54	7.53	7.99	6.84	7.28	8.36	7.83	6.85
Br^-	–	–	0.04	0.05	0.06	0.04	0.03	0.04	–	0.05	0.05	0.05
Li^+	–	–	0.02	0.01	0.01	0.02	0.02	0.02	–	0.02	0.02	0.02
B	–	0.01	–	0.03	0.02	–	0.02	0.02	0.01	–	0.01	0.02
SiO_2	–	0.002	–	–	–	–	–	–	0.001	–	–	–
Bicarbonate as carbonate, $CO_3^=$	0.05	0.06	–	–	–	–	–	–	0.09	–	–	–

[1] Most recent published pre-fill analysis (Hahl and Handy, 1969, p. 14).
[2] First published analysis of shallow (d<20 feet) south arm brines after completion of railroad fill (Hahl and Handy, 1969, p. 14).
[3] Median values of average analysis for each sampling date; sum recomputed to 100 percent.
[4] First published analysis of north arm brines after completion of railroad fill (Hahl and Handy, 1969, p. 14).

Table 3. Estimated composition and concentration of total dissolved load of Great Salt Lake, Utah, if fill had been opened: for selected years 1930, 1969, 1972, and water-year 1973.
[compositions in weight-percent; concentrations in grams per liter]

	1930[1]	1966[2]	1972[2]	Water-year 1973[2]
Cl^-	57.05	54.20	55.82	55.50
Mg^{++}	2.75	3.77	3.65	3.88
Ca^{++}	0.17	0.13	0.08	0.15
Na^+	32.90	31.53	29.77	30.62
K^+	1.61	2.53	2.80	2.54
$SO_4^=$	5.47	7.78	7.79	7.23
Br^-	–	0.05	0.05	0.05
Li^+	–	0.02	0.02	0.01
B	–	–	0.02	0.02
Bicarbonate as carbonate, $CO_3^=$	0.05	–	–	–
Estimated median concentration		265	216	189

[1] Included for comparison (Hahl and Handy, 1969, p. 14).
[2] Post-fill data calculated as if fill had been removed.

Table 4. Total concentrations of dissolved solids of Great Salt Lake brines, water-year 1973.
[concentrations reported in grams per liter]

Date	Shallow south arm d<20 ft.	Deep south arm d>20 ft.	North arm
10-25-72			334.90
10-27-72	151.10	250.91	
1-22-73	141.84	255.96	
2-16-73			313.71
6-19-73	125.99	218.44	
6-20-73			331.75
8-13-73	136.72	274.96	
8-15-73	136.28	260.82	
10- 5-73	138.78	251.88	
10-10-73			340.25
10-11-73			339.60
Mean	138.45	252.16	331.87
Median	137.75	253.92	334.90
Standard deviation	8.18	18.70	10.68
Range	25.11	56.52	26.54

Cadmium

Cadmium in Great Salt Lake north arm brines is present in amounts of less than 0.0001 ppm. Cadmium probably occurs as Cd^{++} and $CdSO_4$.

Mercury

Mercury occurs in Great Salt Lake north arm brines in amounts of less than 0.01 ppm. What mercury is present is probably present as $HgCl_3^-$ or $HgCl_4^=$.

PHYSICAL PROPERTIES

Color

Even the casual observer notes the difference between the blue-green color of the south arm and the pink color of the north arm. According to Quinn (1966, p. 30-31), the red color of the north arm is caused by the algae *Coccochloris elabans*.

Transparency/Turbidity

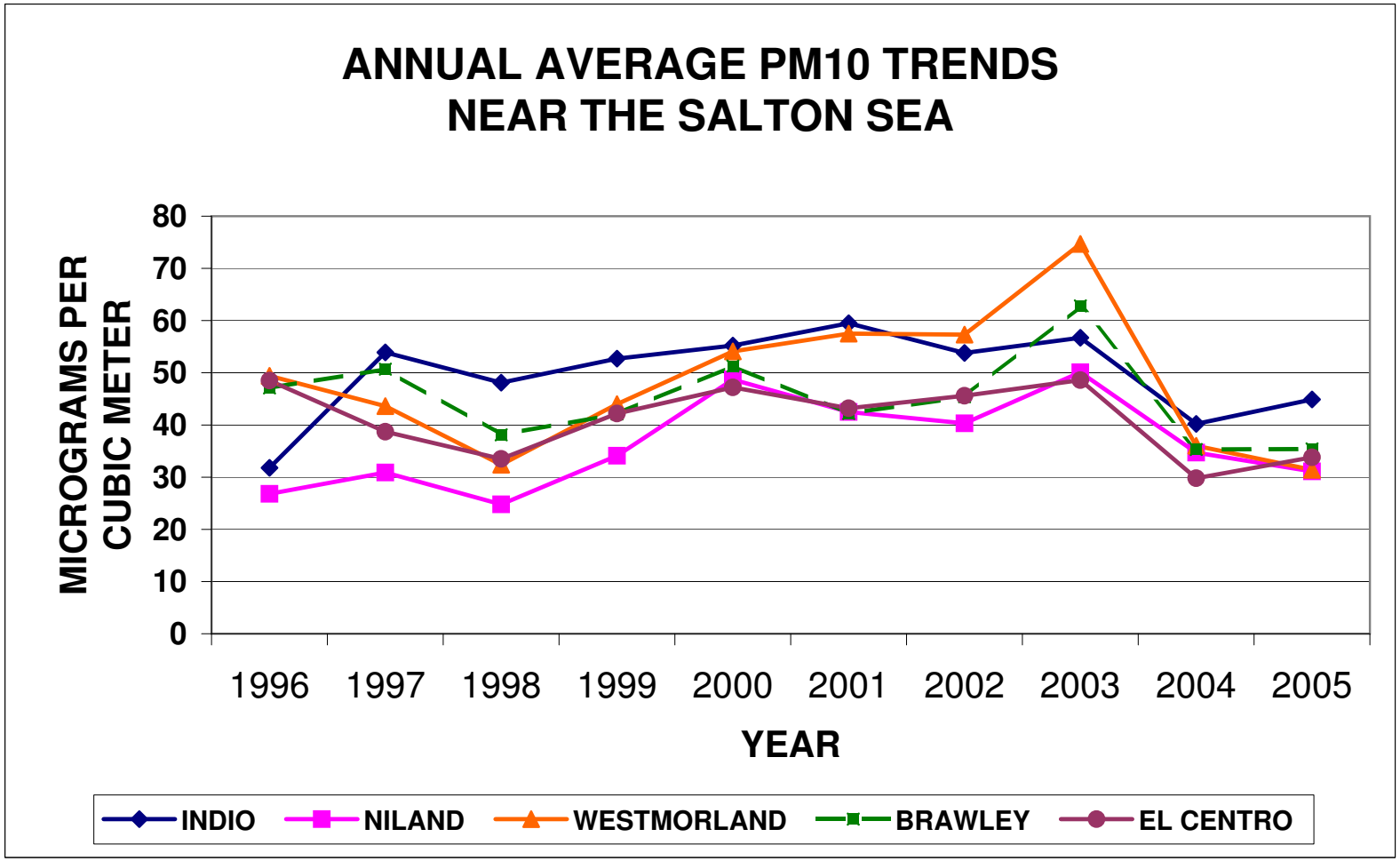
The transparency of the south arm of Great Salt Lake varies widely. During the summer, one may see to depths of 20 feet; but during the winter objects only a few feet deep are invisible. Walter M. Katzenberger has observed that the transition between high transparency and low transparency occurs in May, within a period of one day. The water temperature during this period of transition is about 55° F. The brines of the north arm have low transparency throughout the year.

PM10 AIR QUALITY DATA FOR MONITORING STATIONS NEAR THE SALTON SEA

Year	Estimated Days Above 24-Hour Standards		Annual Average PM10 Concentration (ug/m^3)		3-Year Mean Concentration (ug/m^3)		Highest 24-Hour Average Concentration (ug/m^3)		Expected Peak Day Concentration (ug/m^3)
	Federal (150 ug/m^3)	State (50 ug/m^3)	Federal Procedures	State Procedures	Federal Procedures	State Procedures	Federal Procedures	State Procedures	
PALM SPRINGS STATION, RIVERSIDE COUNTY									
1996	0.0	11.8	29.1	29.1	28	29	130	130	83.6
1997	0.0	insuff. data	27.1	insuff. data	28	29	63	63	87.3
1998	0.0	18.5	26.4	26.3	28	29	72	72	91.9
1999	0.0	19.3	28.9	28.9	27	29	104	104	82.6
2000	0.0	insuff. data	24.2	insuff. data	27	29	44	44	79.1
2001	insuff. data	insuff. data	31.1	insuff. data	28	29	432	432	158.5
2002	0.0	insuff. data	27.2	insuff. data	28	insuff. data	75	73	insuff. data
2003	0.0	23.0	27.1	26.5	28	26	108	106	insuff. data
2004	0.0	insuff. data	26.4	insuff. data	27	26	79	78	90.2
2005	0.0	13.1	25.9	25.4	26	26	66	64	89.4
AVERAGE			**27.3**						
INDIO STATION, RIVERSIDE COUNTY									
1996	13.1	189.2	31.8	55.2	27	55	215	215	180.2
1997	13.0	insuff. data	53.9	insuff. data	37	55	182	182	232.4
1998	3.3	146.2	48.1	48.4	45	55	158	158	205.9
1999	0.0	insuff. data	52.7	insuff. data	52	48	119	119	174.3
2000	8.6	183.2	55.2	55.4	52	55	201	201	171.8
2001	17.6	170.6	59.5	59.0	56	59	604	604	308.4
2002	9.0	174.1	53.8	53.9	56	54	276	276	insuff. data
2003	9.1	158.2	56.7	56.1	57	56	309	302	insuff. data
2004	2.9	74.1	40.2	40.6	50	56	161	161	238.8
2005	0.0	121.7	44.9	45.4	47	56	106	106	197.6
AVERAGE			**49.7**						
NILAND STATION, IMPERIAL COUNTY									
1996	insuff. data	insuff. data	26.8	insuff. data	insuff. data	insuff. data	71	71.0	insuff. data
1997	insuff. data	insuff. data	30.9	insuff. data	insuff. data	insuff. data	191	191	insuff. data
1998	insuff. data	insuff. data	24.8	insuff. data	28	insuff. data	75	72	insuff. data
1999	0.0	37.4	34.1	34.2	30	34	58	58	insuff. data
2000	13.2	122.5	48.7	48.0	36	48	214	214	169.2
2001	6.6	insuff. data	42.5	insuff. data	42	48	377	370	226.4
2002	0.0	83.5	40.3	40.4	44	48	127	128	245.7
2003	19.1	insuff. data	50.1	insuff. data	44	40	402	406	292.8
2004	insuff. data	insuff. data	34.7	insuff. data	42	40	141	138	254.7
2005	0.0	32.0	31.1	31.1	39	31	77	75	248.6
AVERAGE			**36.4**						
WESTMORLAND STATION, IMPERIAL COUNTY									
1996	11.9	119.0	49.4	49.3	38	49	229	229	insuff. data
1997	7.1	insuff. data	43.6	insuff. data	44	49	213	213	192.9
1998	0.0	52.2	32.4	32.1	42	32	81	81	insuff. data
1999	0.0	114.4	44.0	44.3	40	44	130	126	insuff. data
2000	12.6	128.5	54.1	53.6	44	54	250	249	174.1
2001	6.1	insuff. data	57.5	insuff. data	52	54	647	634	291.2
2002	18.3	124.8	57.3	57.5	56	57	297	301	393.3
2003	12.3	188.4	74.7	73.8	63	74	840	848	524.5
2004	insuff. data	insuff. data	36.0	insuff. data	56	74	201	195	453.5
2005	0.0	11.5	31.4	31.4	47	74	54	57	354.2
AVERAGE			**48.0**						
BRAWLEY STATIONS, IMPERIAL COUNTY (station was moved to a new location on same street in 2004)									
1996	6.1	131.0	47.1	46.8	47	47	257	257	182.0
1997	5.8	insuff. data	50.7	insuff. data	48	47	532	532	236.2
1998	0.0	56.2	38.1	38.7	45	39	81	84	insuff. data
1999	0.0	97.3	42.1	42.8	44	43	89	88	insuff. data
2000	7.1	129.8	51.3	51.6	44	52	204	204	140.4
2001	0.0	81.3	42.2	42.7	45	52	120	122	147.1
2002	12.1	70.2	45.4	45.8	46	52	220	222	194.5
2003	insuff. data	insuff. data	62.8	insuff. data	50	46	509	511	309.7
2004	insuff. data	insuff. data	35.3	insuff. data	insuff. data	insuff. data	163	160	insuff. data
2005	0.0	29.4	35.4	35.2	26	35	71	71	insuff. data
AVERAGE			**45.0**						
EL CENTRO STATION, IMPERIAL COUNTY									
1996	6.1	91.7	48.5	48.6	45	49	359	359	185.0
1997	0.0	110.2	38.7	38.5	43	49	120	120	191.4
1998	0.0	56.9	33.5	33.6	40	34	90	87	insuff. data
1999	0.0	60.3	42.2	42.2	38	42	92	95	insuff. data
2000	6.1	118.7	47.2	insuff. data	41	42	180	176	144.9
2001	insuff. data	insuff. data	43.2	insuff. data	44	42	383	375	204.0
2002	5.8	110.7	45.6	45.6	45	46	263	254	247.6
2003	6.1	159.4	48.6	48.6	46	49	180	181	243.7
2004	insuff. data	insuff. data	29.8	insuff. data	41	49	135	132	195.1
2005	0.0	35.6	33.8	33.9	37	49	81	85	152.1
AVERAGE			**41.1**						

Data downloaded from CARB website (www.arb.ca.gov/adam/welcome.html) on December 9, 2006.

ANNUAL AVERAGE PM10 TRENDS:



OZONE AIR QUALITY DATA FOR MONITORING STATIONS NEAR THE SALTON SEA

Year	Days Over Standards: 1-Hour Standards, Federal	Days Over Standards: 1-Hour Standards, State	Days Over Standards: 8-Hour Standards, Federal	1-Hour Data, Parts Per Million (ppm): Maximum	1-Hour Data, Parts Per Million (ppm): 3-Year 4th High	8-Hour Data, Parts Per Million (ppm): Maximum	8-Hour Data, Parts Per Million (ppm): 3-Year 4th High	Expected Peak Day Concentration (ppm)
PALM SPRINGS STATION, RIVERSIDE COUNTY								
1996	12	60	52	0.160	0.158	0.125	0.111	0.154
1997	4	45	26	0.155	0.152	0.117	0.107	0.152
1998	8	40	30	0.173	0.155	0.136	0.107	0.153
1999	1	27	20	0.126	0.143	0.104	0.100	0.143
2000	0	40	28	0.124	0.133	0.104	0.099	0.138
2001	6	53	39	0.137	0.128	0.113	0.100	0.130
2002	2	49	46	0.136	0.132	0.124	0.105	0.134
2003	4	54	43	0.141	0.133	0.110	0.108	0.135
2004	1	36	32	0.125	0.131	0.106	0.104	0.131
2005	4	41	35	0.139	0.130	0.116	0.104	0.130
INDIO STATION, RIVERSIDE COUNTY								
1996	0	27	23	0.118	0.124	0.100	0.094	0.125
1997	0	1	1	0.102	0.124	0.094	0.089	0.129
1998	2	16	12	0.134	0.118	0.115	0.088	0.128
1999	1	13	7	0.126	0.121	0.107	0.086	0.118
2000	0	7	7	0.112	0.121	0.096	0.090	0.116
2001	0	21	15	0.114	0.112	0.098	0.089	0.111
2002	0	24	15	0.114	0.112	0.110	0.092	0.112
2003	0	24	19	0.123	0.114	0.105	0.096	0.116
2004	0	23	18	0.111	0.113	0.099	0.097	0.114
2005	0	18	18	0.114	0.113	0.095	0.095	0.114
NILAND STATION, IMPERIAL COUNTY								
1996	no data	no data	no data	no data	no data	no data	no data	no data
1997	0	1	0	0.100	0.080	insuff. data	insuff. data	insuff. data
1998	0	5	4	0.110	0.100	0.100	insuff. data	0.106
1999	0	0	0	0.090	0.100	insuff. data	insuff. data	0.103
2000	no data	no data	no data	no data	no data	no data	no data	no data
2001	0	2	1	0.105	0.090	0.086	insuff. data	0.100
2002	0	5	5	0.102	0.100	0.092	insuff. data	0.100
2003	0	0	0	0.090	0.100	0.075	0.079	0.099
2004	0	0	0	0.092	0.098	0.081	0.078	0.095
2005	0	0	0	0.091	0.090	0.078	0.072	0.089
WESTMORLAND STATION, IMPERIAL COUNTY								
1996	no data	no data	no data	no data	no data	no data	no data	no data
1997	no data	no data	no data	no data	no data	no data	no data	no data
1998	0	10	8	0.120	0.100	0.096	0.091	0.113
1999	10	24	7	0.145	0.142	0.107	0.092	0.113
2000	no data	no data	no data	no data	no data	no data	no data	no data
2001	0	1	1	0.105	0.142	insuff. data	insuff. data	insuff. data
2002	0	0	0	0.092	0.091	0.080	insuff. data	0.091
2003	1	5	0	0.144	0.097	0.077	insuff. data	0.099
2004	0	6	0	0.109	0.106	0.083	0.073	0.102
2005	0	11	10	0.112	0.110	0.100	0.079	0.111
EL CENTRO STATION, IMPERIAL COUNTY								
1996	6	41	28	0.140	0.140	0.113	0.099	0.145
1997	2	29	11	0.130	0.140	0.111	0.099	0.148
1998	1	12	1	0.130	0.130	0.087	0.092	0.135
1999	2	9	0	0.140	0.130	insuff. data	0.085	0.129
2000	no data	no data	no data	no data	no data	no data	no data	no data
2001	2	13	2	0.135	0.127	insuff. data	insuff. data	0.123
2002	0	19	9	0.122	0.116	0.098	0.086	0.121
2003	2	19	8	0.130	0.127	0.092	0.087	0.125
2004	0	1	0	0.096	0.118	0.080	0.085	0.119
2005	0	8	5	0.122	0.121	0.097	0.084	0.115

Data downloaded from CARB website (www.arb.ca.gov/adam/welcome.html) on December 9, 2006.