



A Map: A Plan; A Canal; A Beach
The Comedy of Crystal Lake:
An Unique Historical Event

Dr. Stacy Leroy Daniels
LEELANAU CLEAN WATER
15 September 2016

**"Life is a tragedy when seen in close-up,
but a comedy in long-shot."
-- *Charlie Chaplin***



The “Tragedy” / “Comedy”

An attempt to construct a system of canals in NW Lower MI in 1873 led to the dramatic lowering of the level of Crystal Lake (Benzie Co.). Creation of a beach insured its future as a prime recreational area.

The unintended consequences evolved from a perceived “failure” of an “ill-conceived” project by an apparent scapegoat, to an unqualified “success” by a visionary celebrated as a local hero. Rediscovery of an historic map supporting the project allowed for quantitative assessment of this epochal event.



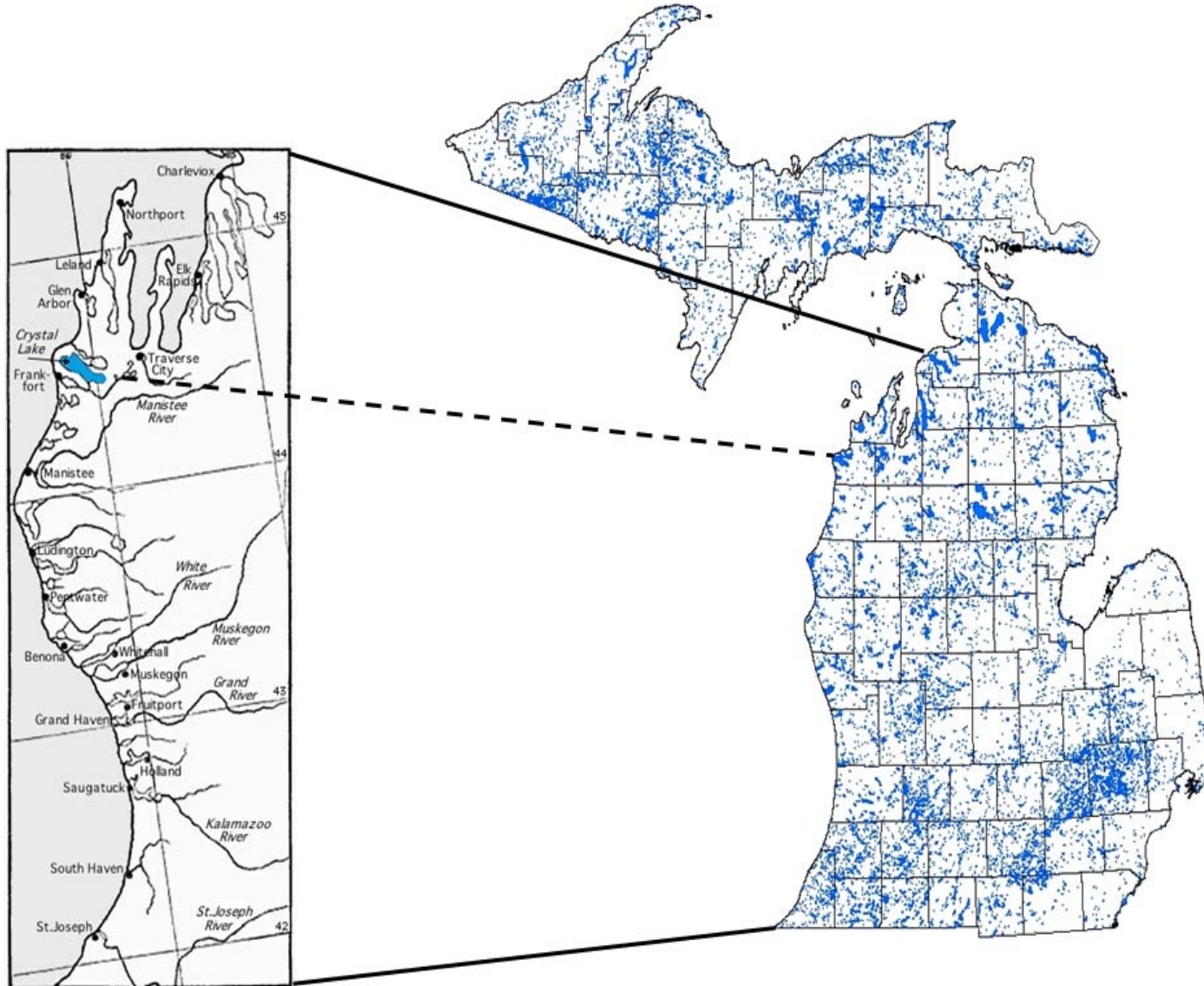
Crystal Lake - Viewed from Space



SeaWiFS Project, NASA/Goddard Space Flight Center, & ORBIMAGE, Great Lakes, 21 Apr 1999.

<http://visibleearth.nasa.gov/view.php?id=52939>

A Brood of Lakelets



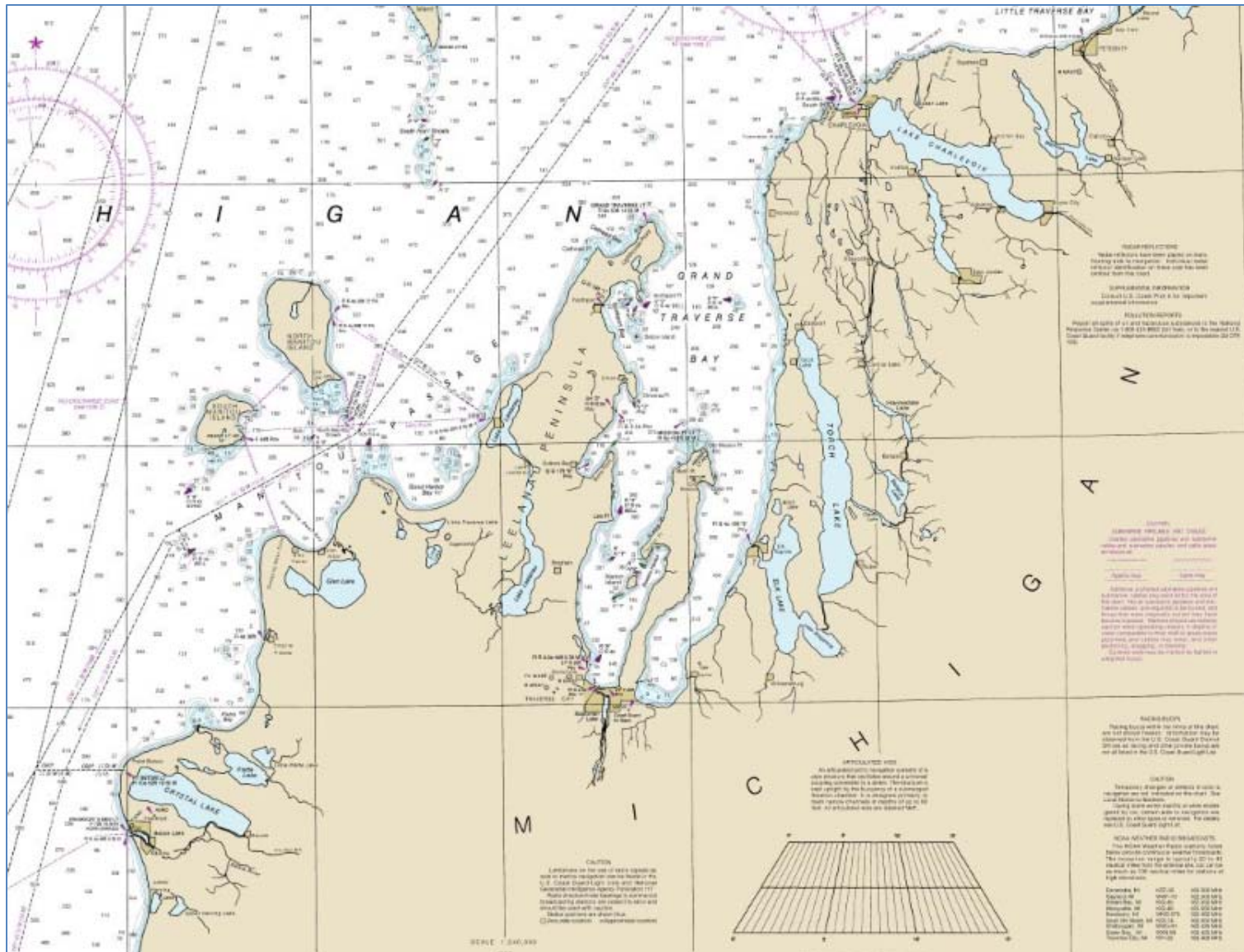
Winchell, Alexander, Climate of the Lake Region, Harper's New Monthly Magazine 43(254), 275-285 (Jul 1871).

<http://books.google.com/books?id=lw0wAAAAMAAJ> , page 284 (color enhanced).

Michigan Groundwater Mapping Project, Public Act 148 of 2003, Michigan Lakes,

<http://www.egr.msu.edu/igw/GWIM%20Figure%20Webpage/Webpages%20-%20Links/Michigan%20Lakes.htm>

North End of Lake Michigan



<http://www.charts.noaa.gov/OnLineViewer/14902.shtml>

Commonalities

Aspects:

- **Geological histories**
- **Physiological features**
- **Hydrological behaviors**
- **Climatic influences**
- **Visual beauties**
- **Recreational pursuits.**

Visions:

- **Clear waters**
- **Bright sunshine**
- **Gentle waves**
- **Pristine beaches**
- **Wooded hillsides**
- **Scents of pine**
- **Spirit of place**

We escape the congestion and “hustle-bustle” pace of our cities by vacationing at our special lake to experience carefree living, roughing it, returning to the simple life, and communing with nature.

Uniquities

Improvements:

- “Harbors of refuge” for shipping, and inland waterways to access the interior of the State.
- Other “improvements (canals, dams, locks, docks, etc.) to transport settlers, raft timber, power saw and grist mills, and irrigate fields.

Locations: (*)

Saugatuck, Holland, Grand Haven, Muskegon, White Lake, Pentwater, Ludington, Manistee, Portage, Frankfort, Leland, Charlevoix, and Petoskey.

(*) West coast of MI =
East shore of Lake MI

Comparisons of Lakes & Dams

- Crystal Lake Dam
- Crystal Lake
- AKA 'Cap Lake
- Benzie Co.
- Original dam ca. 1873
- Six "temporary" dams
- Permanent 1911
- Level dropped 20 ft
- Still one large lake
- Leland Dam
- Lake Leelanau
- Aka Carp Lake
- Leelanau Co.
- Original dam ca. 1854
- Rebuilt 1867
- Permanent 1909
- Level raised 12 ft
- Combined three lakes

Both lakes were glacial embayments. The dams had checkered pasts (successes & failures)

Crystal Lake & Environs



Photograph® by Marge Beaver, Photography Plus, 2005.

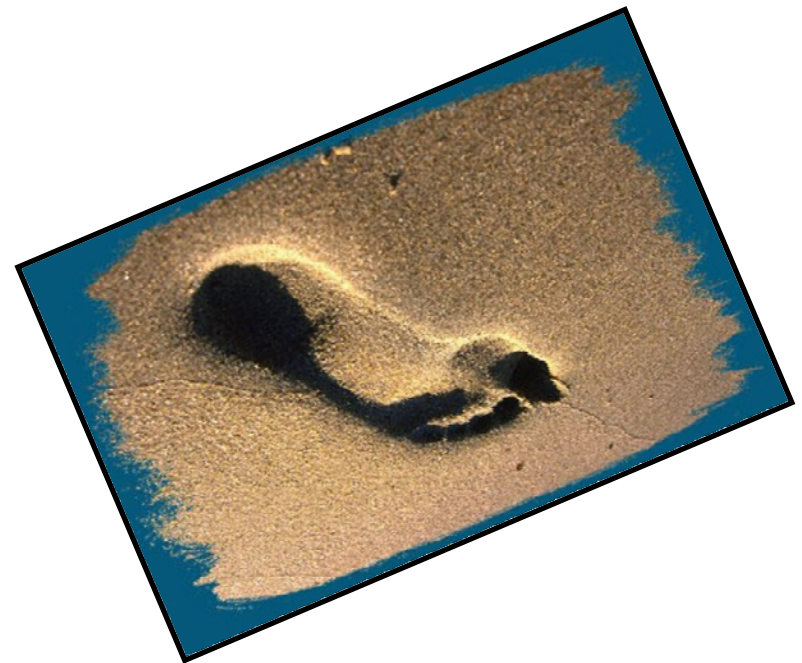
The Bathtub on the Hill



Crystal Lake (9th largest in MI) (15.40 sq mi)
Relatively small watershed area (43.97 sq mi)
Former embayment of glacial Lake Algonquin
Isolated by dunes at the isthmus of Point Betsie
Perched at 600 ft (23 ft higher than Lake Michigan)

Crystal Lake – A Big Footprint

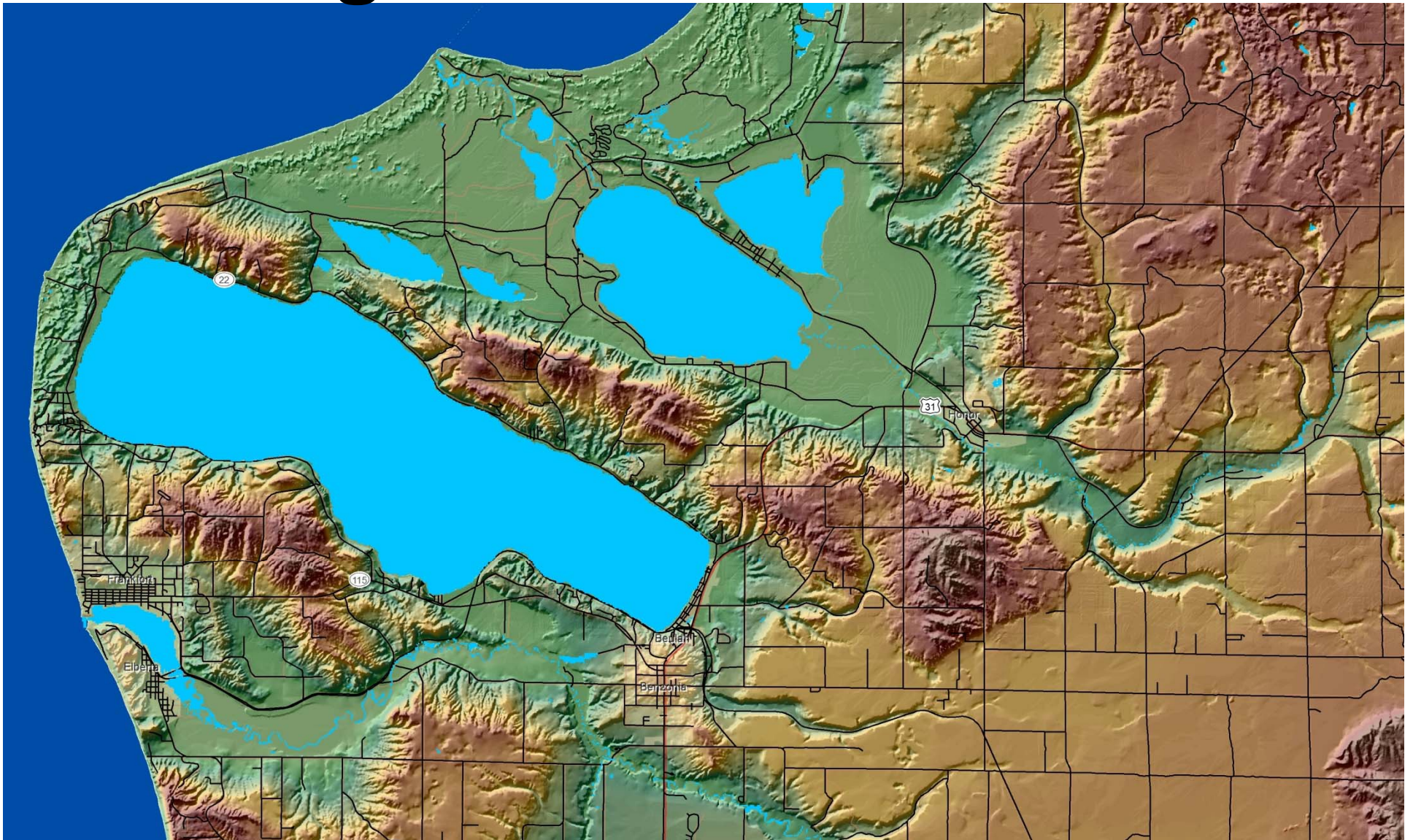
Length	8.1	mi
Width	1.9	mi (1.41 – 2.46 mi)
Depth	165	ft (max) (#3)
	71	ft (mean)
Area	44.65	mi ² (Total)
	28.58	mi ² (Land)
	15.40	mi ² (Lake)
	9,854	Acre (34.4%) (#9-11)
	1.856	(Land/Lake)
Volume	741,366	Acre-feet (#3)
	32,000,000,000	ft ³
	242,000,000,000	gal
	916,000,000,000	liters
Perimeter	20.838	mi (top #20)
Detention	32	yr
(Rank # of large inland lakes in MI)		



Moraines & Terraces

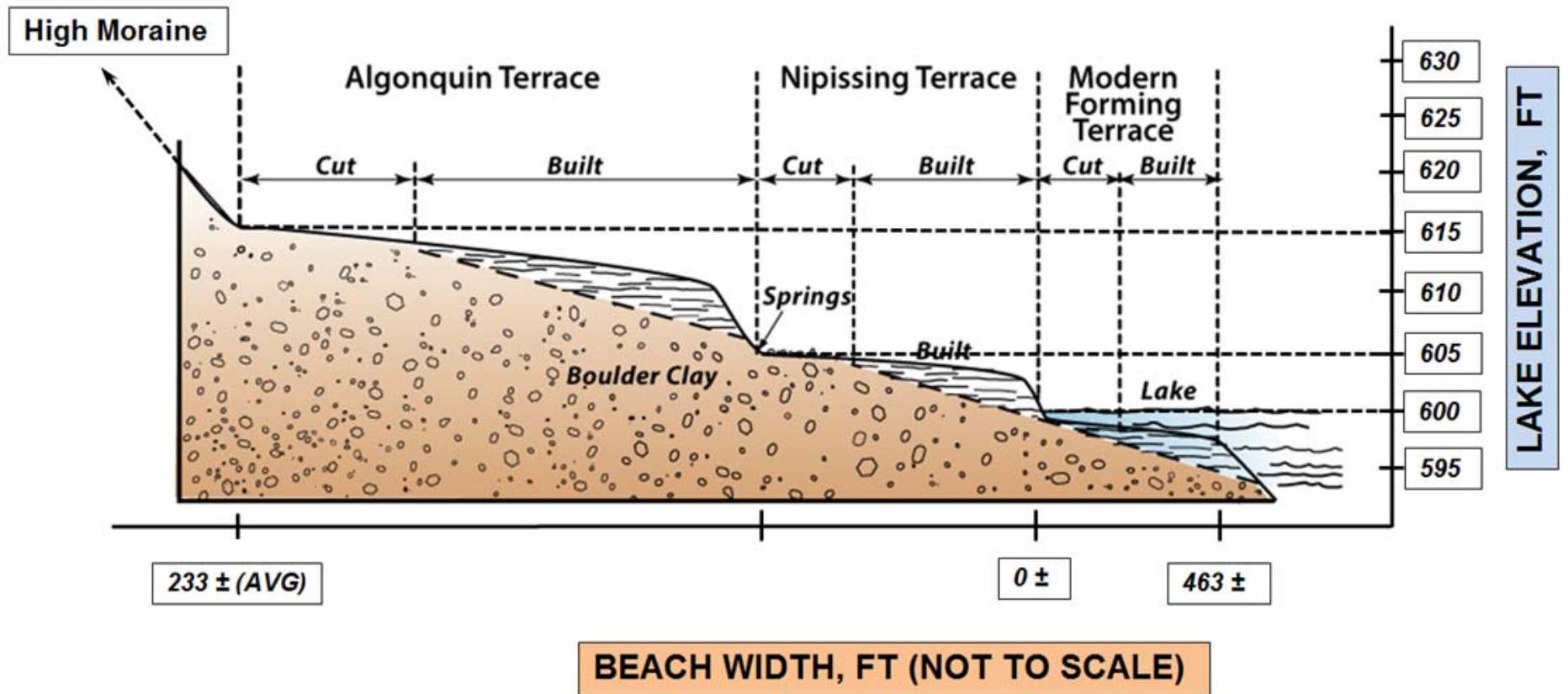
- **Moraine: unconsolidated soil and rock deposited around the edges of glaciers**
- **Terrace: a step-like landform of gently sloping “treads” and steeper “risers”**
- **Lake terraces: former shorelines of glacial lakes**
- **Composition: eroded materials above the waterline, and deposited sediments below the waterline**

Digital Elevation Model



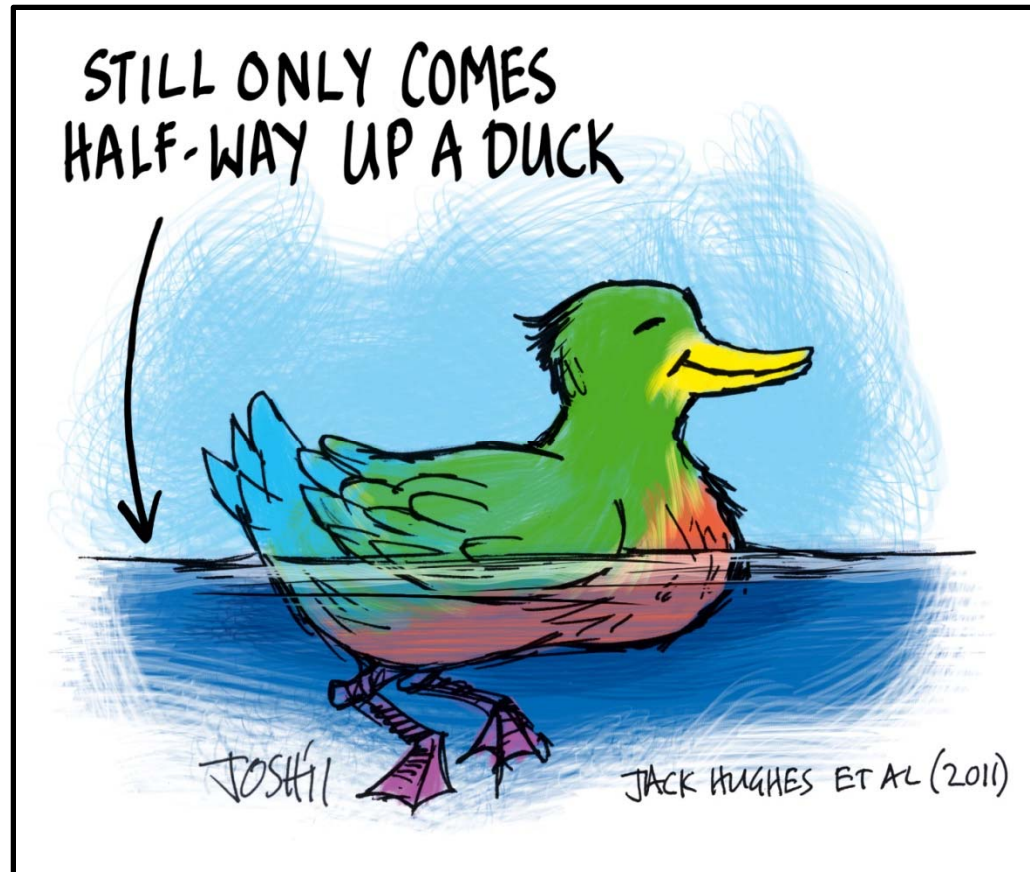
Crystal Lake is ringed by moraines and terraces.

Crystal Lake: Its Many Levels



(Adapted after I.D. Scott, Inland Lakes of Michigan, 1921.)

The Level of Crystal Lake



Elevation: 600 +/- 0.25 ft (IGLD1985)
(Summer: 01 May - Oct 31; Winter: 01 Nov - 30 Apr 30)

Pulling the Plug

When should littorians be put in an old-folks home ?

Fill up their lake. Offer a teaspoon, teacup, and bucket.



Ask them to empty their lake.

A normal littorian would use the bucket.

It's bigger than the spoon or the teacup. Right ?

No. A normal littorian would just pull the plug !

Do you want a bed near a window overlooking the lake ?

“Archie” (allegedly) pulls the plug!



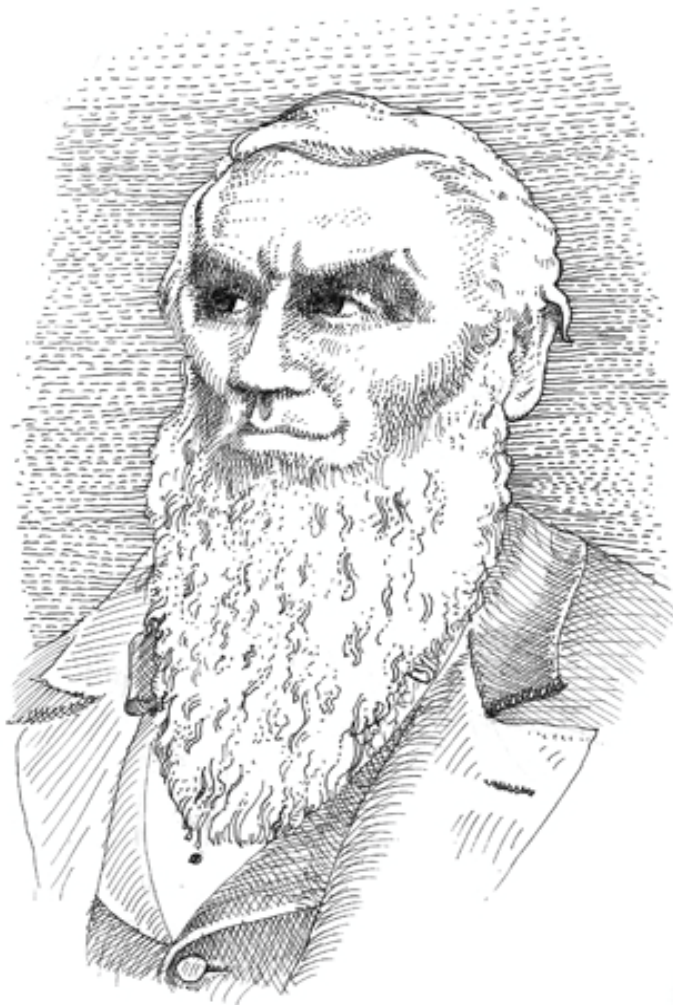
ARCHIBALD JONES

(1811-1890)

President of the Benzie Co.
River Improvement Co.

Responsible for the
enterprise that resulted in
the lowering of Crystal Lake
by 20 ft in 1873.

*“The top of Crystal Lake was
too far above the beach !”*



The "Company"



\$25 at 8% compounded for 137 years ~ \$1,000,000 !

Proposed Improvements

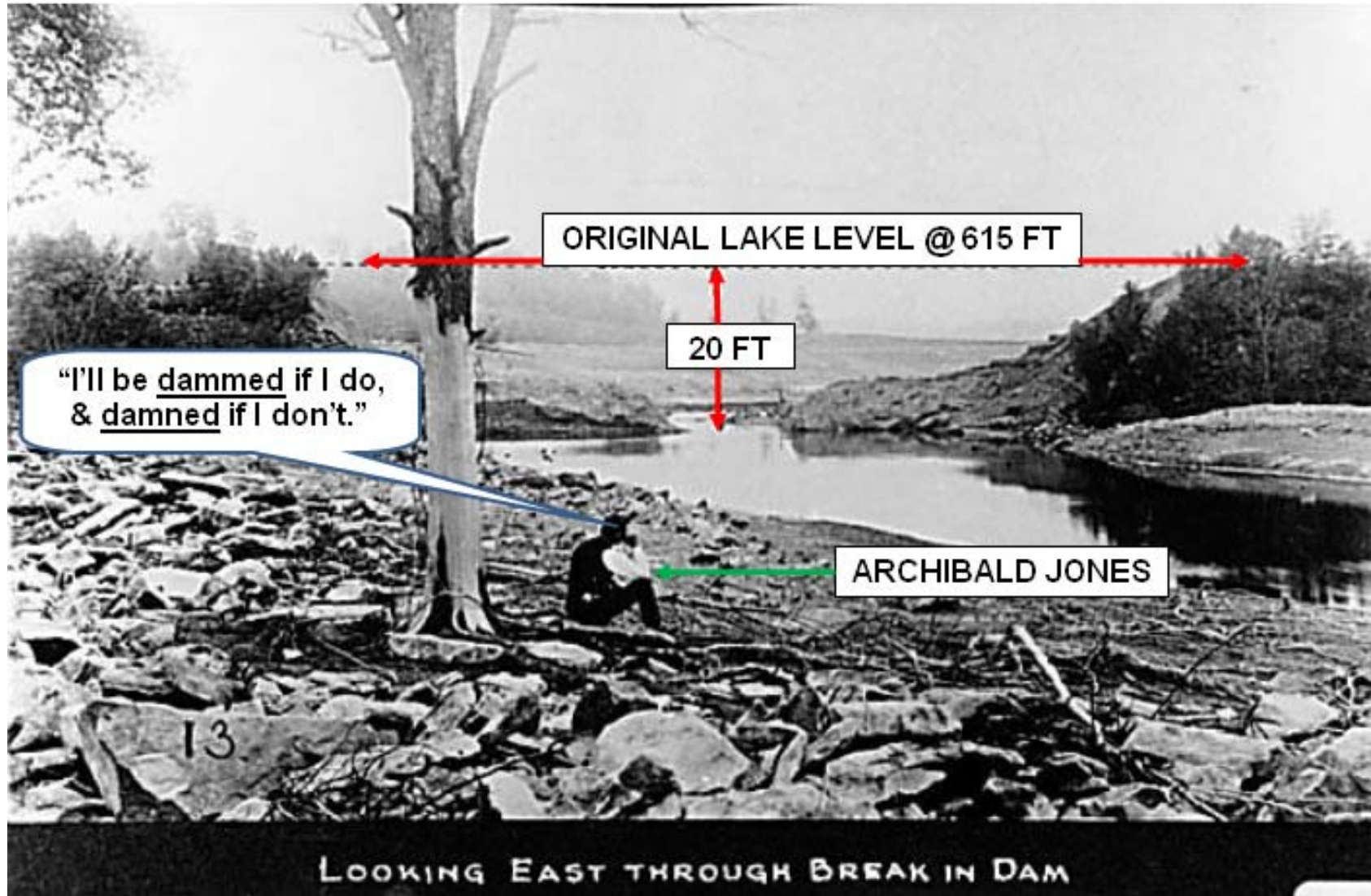
1. **Purchasing lands on Crystal Lake to secure and improve water-lots in places suitable for business**
2. **Opening a passage for boats between Betsy River and Crystal Lake by straightening the outlet channel from the lake to the river, and clearing it of all timber to a width of 100'**
3. **Removing obstructions in the way of navigating Betsy River**
4. **Building a steamboat and accompaniments for transportation of passengers and freight**

Crystal Lake Weather (*)



(*) The most severe storm in the history of the Weather Bureau passed over Crystal Lake ~ 23 Aug 1873!

Archie: The Morning After ?



[(*) The "Tragedy" was 19 times larger than the famous Johnstown Flood (1889)!

Early Dams

Crystal Lake Outlet Dam
ca. <1911



Leland Dam
ca. 1901



Crystal Lake Outlet Dam (1912-3)



[(*) The group may well be Archibald Jones' three grandchildren (!) George C. Jones, Irving Park Jones, and Rosa May Jones.]

Archibald / Sophia Jones, R.I.P

**ARCHIBALD HUSBAND OF S. JONES
BORN SEP. 14 1811 DIED MAY 15, 1890**
"He builded better than he knew."

**SOPHIA WIFE OF A. JONES
BORN JAN 23, 1817 DIED AUG 10, 1887.**



Maplewood Memorial Lawn Cemetery, Emporia, KS

“Map Showing Sources & Courses of the Platte and Betsey Rivers, Benzie County, Together with Some of the Obstructions and Proposed Improvements, Drawn for the BENZIE COUNTY RIVER IMPROVEMENT Co., by B. C. Hubbell, Draftsman, Benzonia, Mich.”, *ca. 1873.*

- **Three canal routes (South, North, & West) highlighted**
- **South (attempted); North (proposed); West canal (added)**
- **Map found in wall of 1870 farmhouse of John Bailey,**
- **VP, BCRIC; surveyor, Crystal City & Beulah View Resort**
- **Donated 1980; rediscovered 2011; restored 2012; GIS 2016.**

The "Hubbell" Map (ca. 1873)



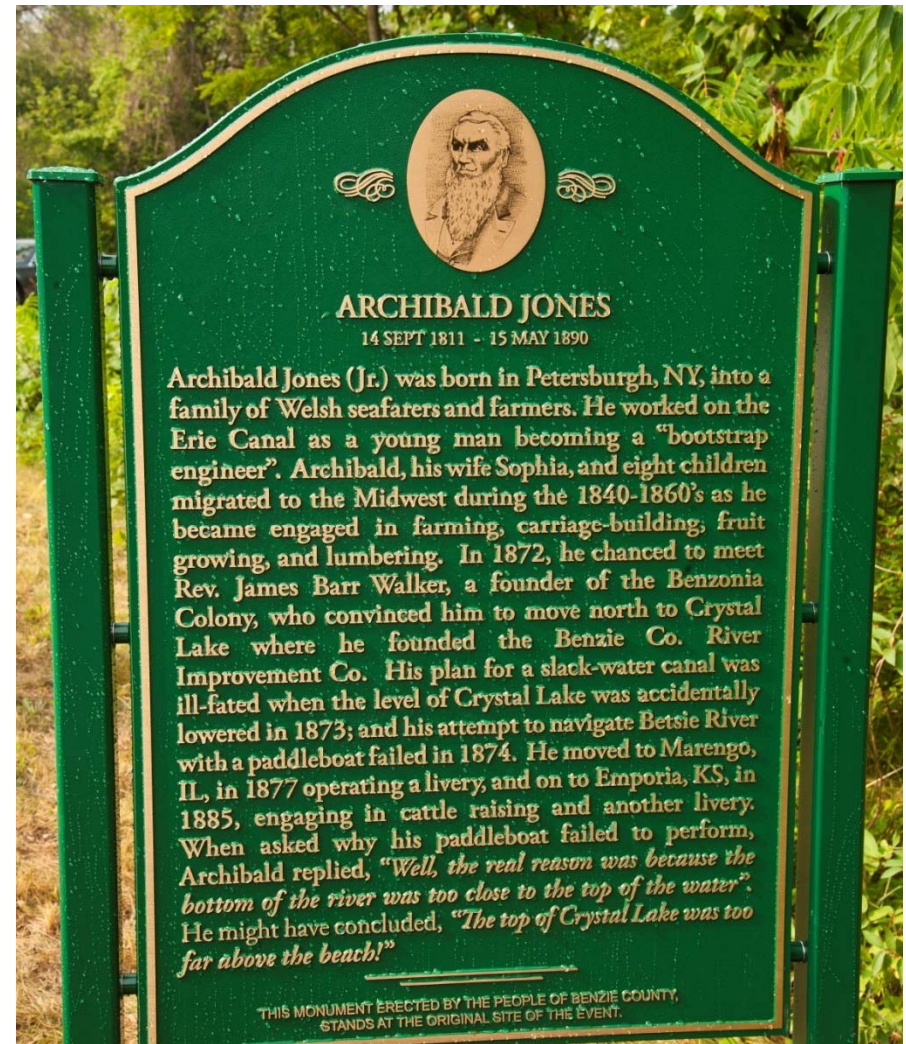
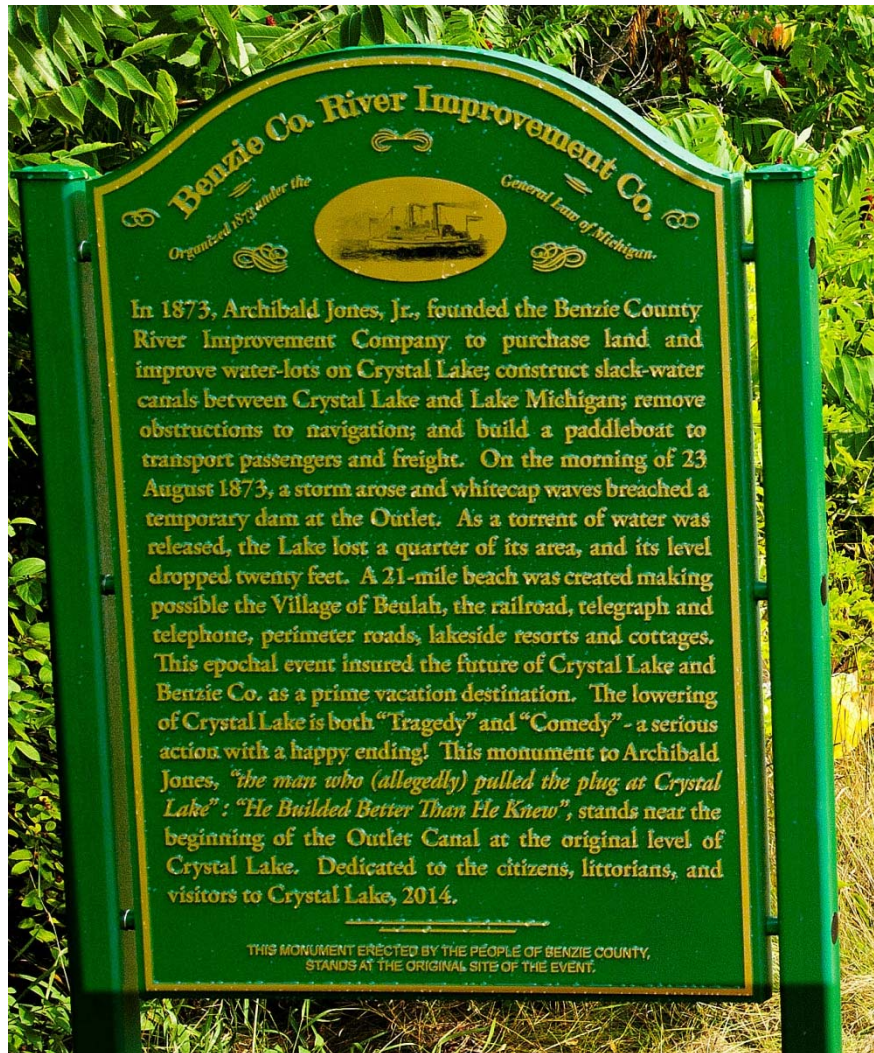
Changes in Crystal Lake

- **Water level dropped 20 ft**
615 → 595 → 600 ft (asl)
- **Surface area:**
10,426 A → 9,843 A
- **Volume**
~ 50,000,000,000 gal down the Outlet
- **Water surface lost = beach gain = 583 A**
- **Length of beach: 21 mi perimeter**
- **Depth of beach: 233 ft (avg.)**

High / Wet; Just Right; Low / Dry



Historical Marker at the Outlet



[(*) Dedicated at the Crystal Lake Outlet, 22 Aug 2015.]

Crystal Lake Redux

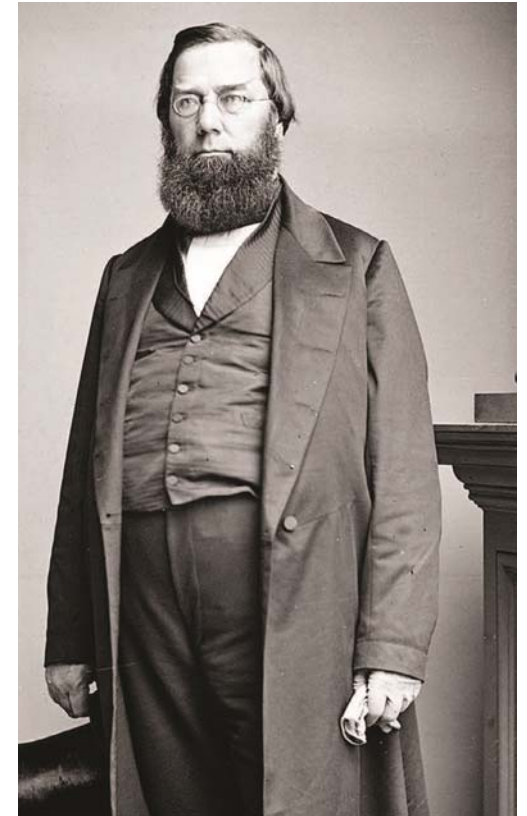
"Many similar enterprises have been conceived and executed in modern times, both for the purpose of reclaiming land covered by water and for sanitary reasons. They (the consequences of draining lakes) are sometimes attended with wholly unexpected evils, ... "

-- George Perkins Marsh,

American Environmentalist,

"Man and Nature or Physical Geography as Modified by Human Action", 1865.

Page 432



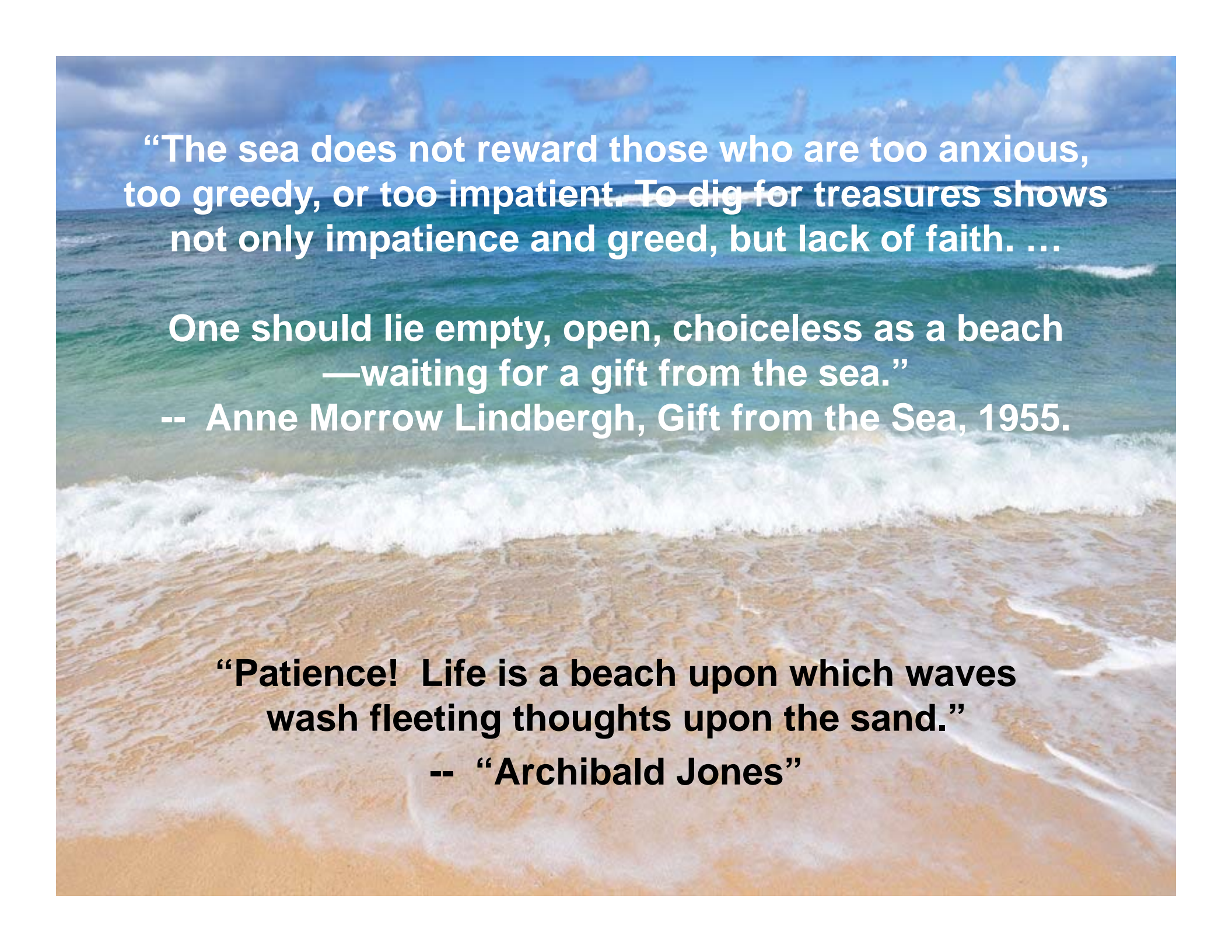
Conclusion

"The event was so epochal in its nature and has such a permanent bearing on the subsequent development of Benzie County that it is rightly considered as one of the major incidents of the county's early history."

-- Leonard L. Case, A Bicentennial Reader, 1976.

The beach around the Lake made possible:

- **coming of the railroad;**
- **installation of telegraph and telephone;**
- **lakeside resorts, church camps, a yacht club;**
- **state boating access site;**
- **1,100 cottages (~100 ft frontage)**
- **perimeter roads; state highway (M-22)**
- **Betsie Valley Trail;**
- **Village of Beulah;**
- **modern recreational community.**



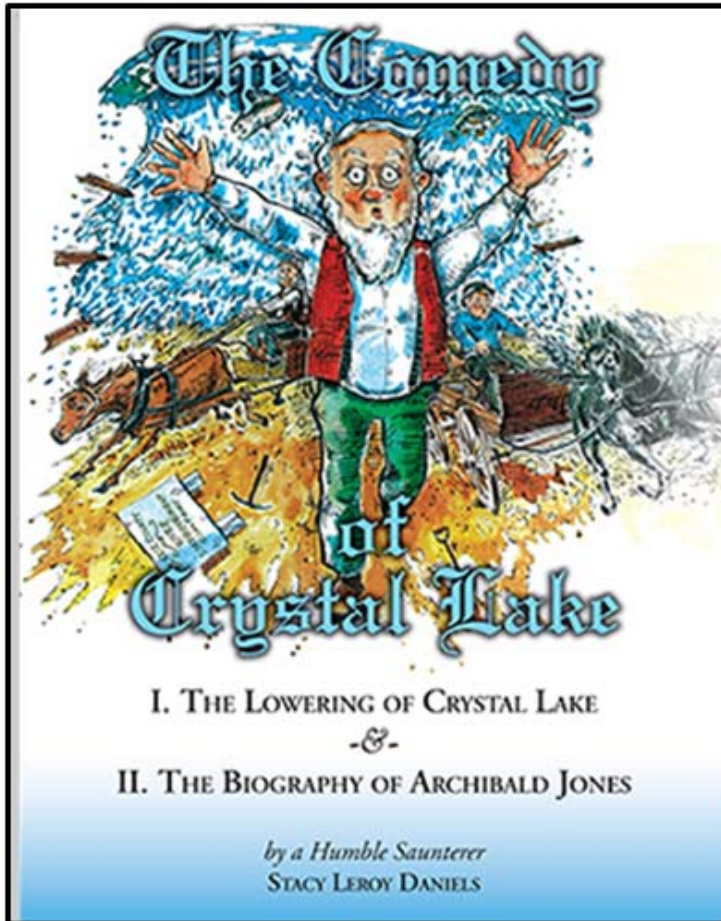
“The sea does not reward those who are too anxious, too greedy, or too impatient. To dig for treasures shows not only impatience and greed, but lack of faith. ...

**One should lie empty, open, choiceless as a beach
—waiting for a gift from the sea.”**

-- Anne Morrow Lindbergh, Gift from the Sea, 1955.

**“Patience! Life is a beach upon which waves
wash fleeting thoughts upon the sand.”**

-- “Archibald Jones”



The Comedy of Crystal Lake

Stacy Leroy Daniels

ISBN 978-0-692-21715-3

\$49.95 | Hardcover | 9 x 12

496 pages with over 200 illustrations

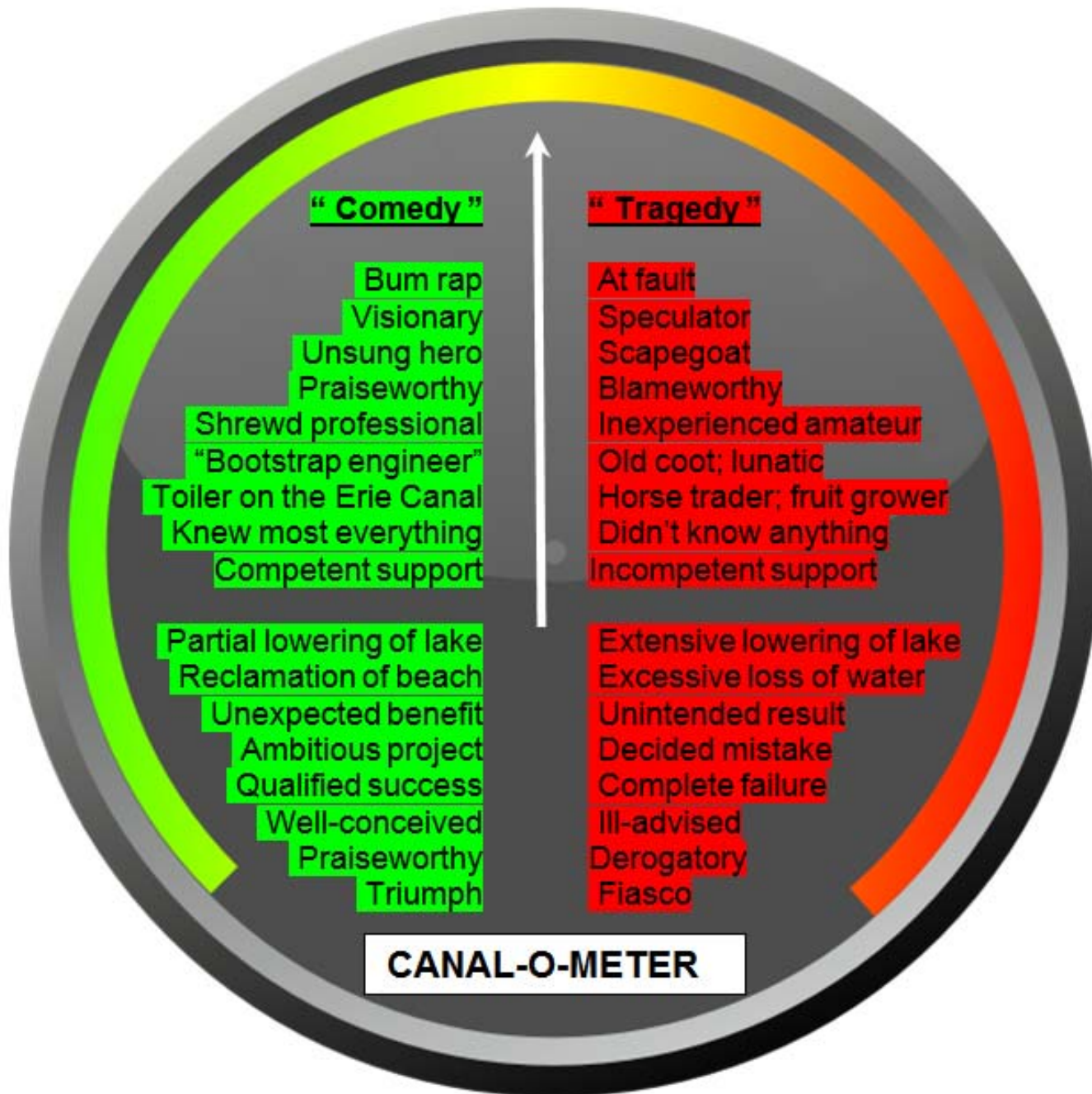
Flushed With Pride Press

<http://www.ComedyCrystalLake.com>

A sequel to the classic booklet, "*The Tragedy of Crystal Lake*" (1922), being a summary chronicle with many more sidelights, of a tale written in two parts, describing a seemingly ill-fated historical event, so epochal in its nature as to have had a permanent bearing upon the development and future of Benzie Co., Northwest Lower Michigan, together with myriad viewpoints of its diverse characters and sundry locales, &c, &c.

The real-life story of the attempt by Archibald Jones to build a slack-water canal from Crystal Lake to Lake Michigan in 1873 has elements of tragedy and comedy - a serious beginning and a happy ending - with foibles of human nature and consequences of bold venture: the dramatic lowering of a very large inland lake and the creation of a long sandy beach.

All net proceeds from direct sales will be donated to nonprofit organizations if designated at point of sale.



Grin and Bear It !



Bears swim with humans at Lake Tahoe

<https://i.ytimg.com/vi/BPKEUwpsyqo/hqdefault.jpg>

<https://www.youtube.com/watch?v=aDqDFve6JJU>

Crystal Lake Canal Boat (?)



Lake / Canal / Beach Parameters

Crystal Lake

Canals

<u>Parameter</u>	<u>Before</u>	<u>After</u>
Elevation, ft (*)	615	600
Δ Elevation, ft (net)	0	-15
Length, mi	>8.5	8.1
Width, mi	>3.0	~2.5
Depth, ft (net)	180	165
Perimeter, mi	22.438	20.622

<u>Name</u>	<u>Total</u> (Dredged), mi
South	8.948 (1.410)
North	8.522 (1.490)
West	0.635 (0.635)

Beach (High → Low → Present)

Area, Acres	9,843	10,426
Volume, Bgal	~293	~242
Δ Area, %		- 6
Δ Volume, % (~)		- 17

Date Drop, ft Area, A Width, ft

1873	615	“0”	“0”
1895	595	1,712	696
2016	600	583	233

(*) Shoal (5-ft) = 595 ft

SLD: (Rev'd: 07/23/16)

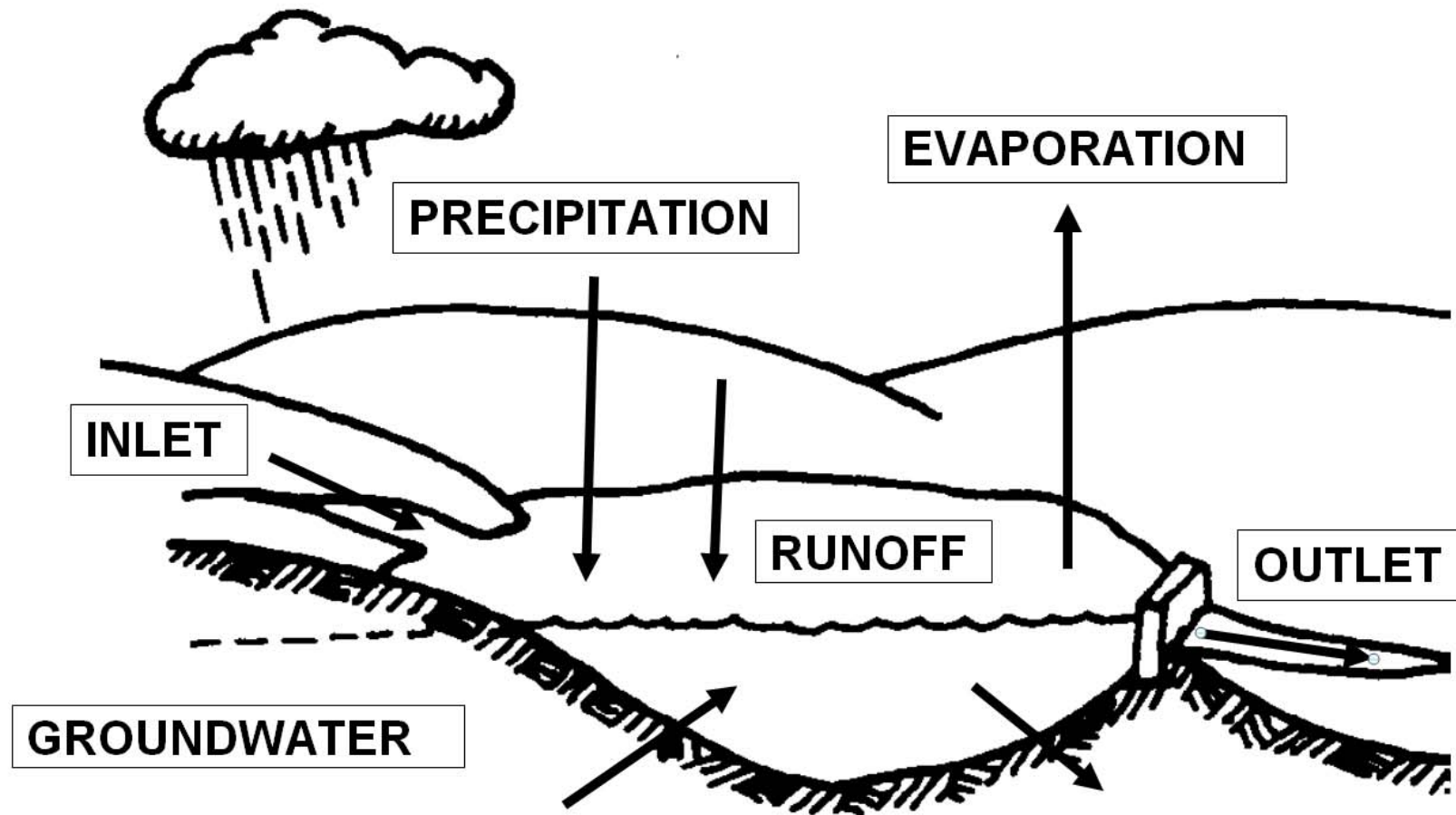
SBDNL – Platte River Unit





<https://upload.wikimedia.org/wikipedia/commons/thumb/2/2e/MichiganLargestLakes.svg/535px-MichiganLargestLakes.svg.png>

Watershed = Land + Water



Crystal Lake: a groundwater drainage lake