Lake Mead National Recreation Area Water-Quality Monitoring

Prepared for the Lake Mead Ecosystem Monitoring Workgroup Meeting

November 13, 2014

By Ronald J. Veley
U.S. Department of Interior
U.S. Geological Survey (USGS)

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Why Collect the Data?

Lake Mead on the Colorado River…

is a drinking, industrial, and irrigation water source for over 22 million users.

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is listed as critical habitat for the endangered razorback sucker.

Why Collect the Data? (Continued)

- **Urbanization—Las Vegas, Mesquite, and St. George.**

(point and non-point sources such as irrigated agricultural fields, dairy operations, periodic storm-water runoff, cooling water from power plants, and municipal waste water…)

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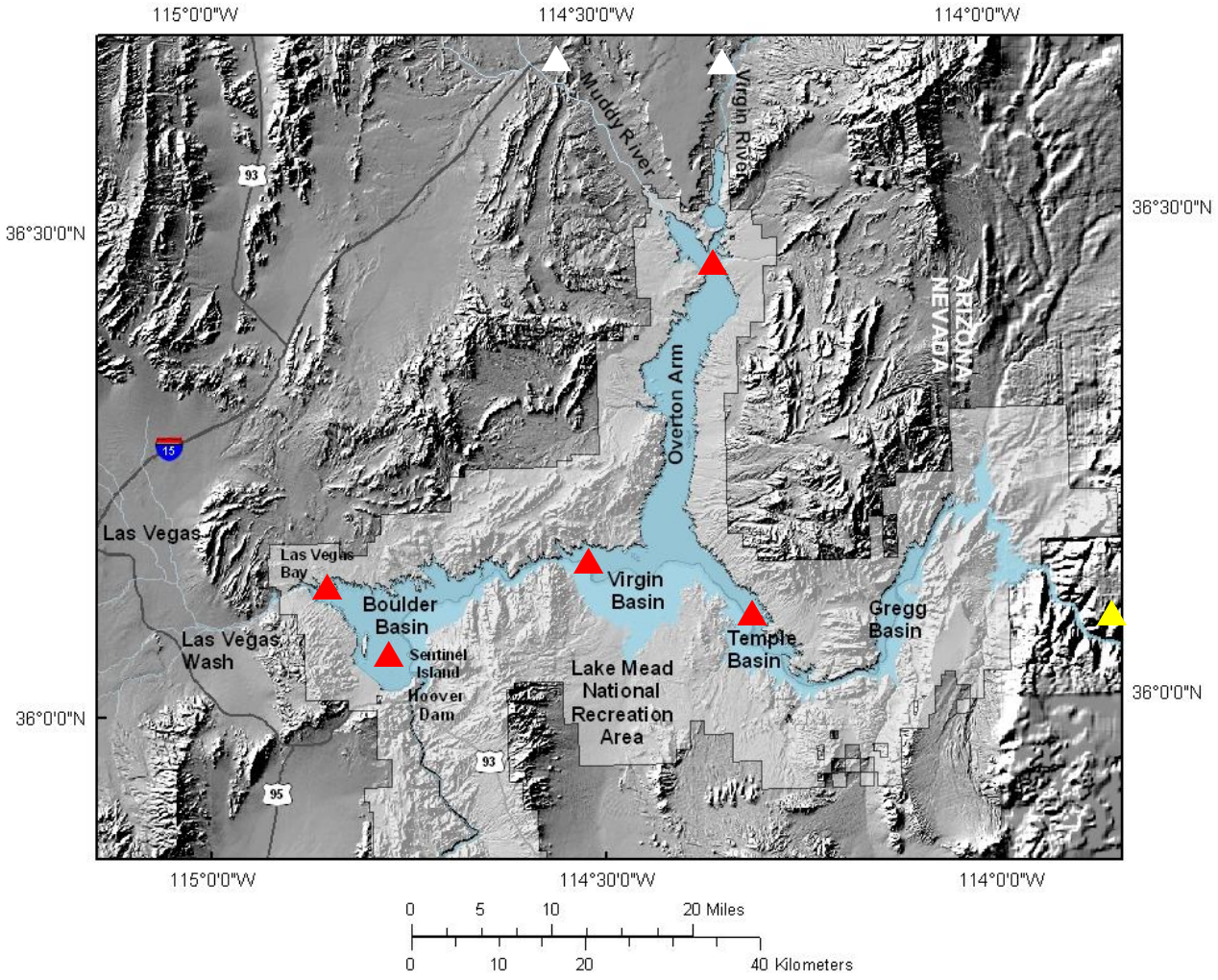
Hydrodynamic models – better understand and predict conditions in the lake.

Drought and High Flow Events.

Lake Mead Water-Quality Monitoring: Historic Station Locations



- ▲ Colorado River
- ▲ Muddy and Virgin Rivers
- ▲ Lake Mead

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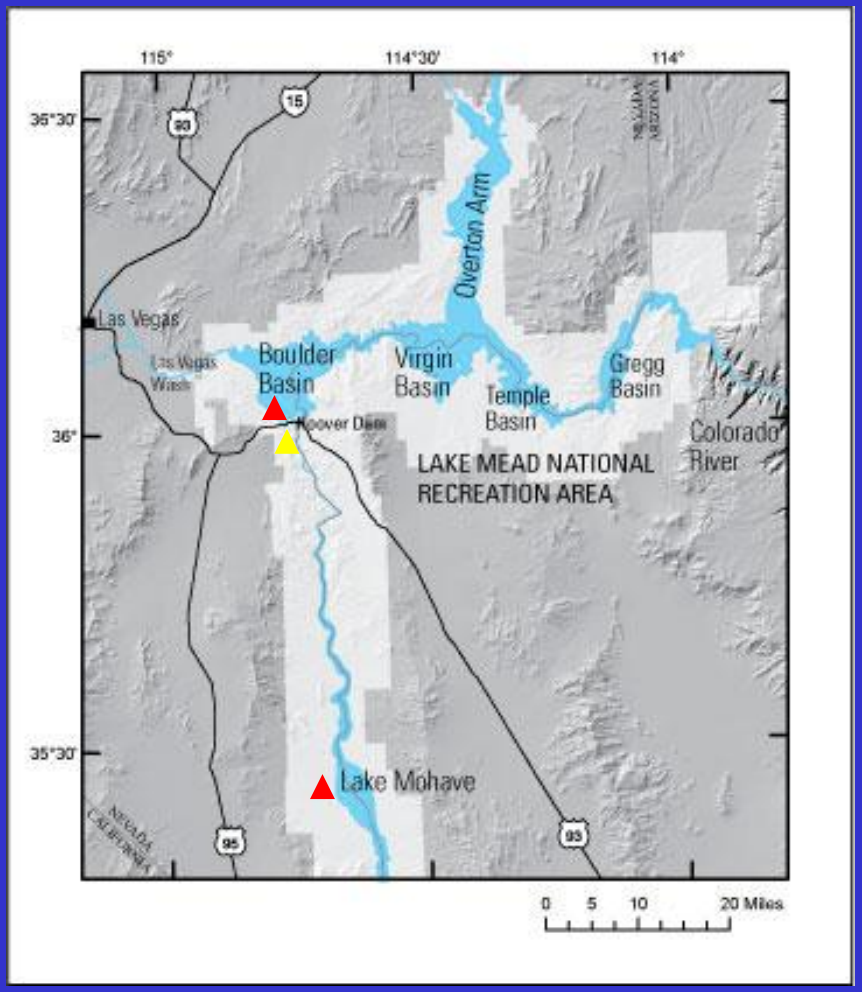
Lake Mead Water-Quality Monitoring: Active Station Locations



- ▲ Lake Mead & Mohave
- ▲ Lower Colorado River

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Lake Mead – Boulder Basin Monitoring Station

Boulder Basin Monitoring Station

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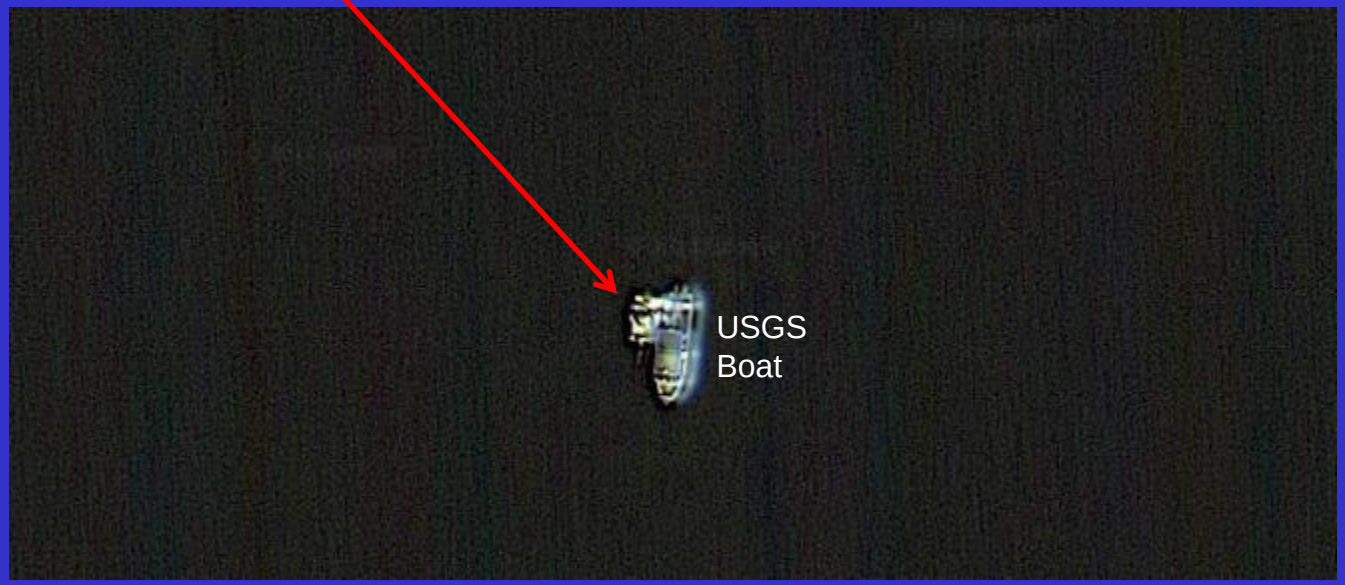
Boulder Basin Monitoring Station – Service Visit Captured by Satellite (2014)



Boulder Basin Monitoring Station

Near-continuous depth-dependent water-quality data collected include:

- Water Temperature
- Specific Conductance
- Dissolved Oxygen
- pH
- Turbidity

Note: 4 profiles every 6 hours (starting after midnight daily)—every 5 meters (starting at 1 meter below surface)

USGS Nevada Water Science Center — Water–Quality Monitoring at Lake Mead - Internet Explorer

http://nevada.usgs.gov/water/lmqw/data_boulder.htm

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Water–Quality Monitoring at Lake Mead National Recreation Area, Arizona and Nevada

Near-Real-Time and Quality Assured Data

Additional Information

Project Bibliography

Lake Mead Water Quality Home Page

Contact Information

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Nevada Water Science Center
160 N. Stephanie St.
Henderson, NV 89074

Nevada Water Science Center Home Page

Boulder Basin

Current Data

Current Profile Data: Graphs | Table
Current Meteorological Data: Graphs | Table

Historic Quality-Assured Data

Water Year 2011||Water Year 2012||Water Year 2013

Note: These data should be considered PROVISIONAL and are subject to revision until formal USGS publication.

Data Collection

Location: Latitude 36° 02' 46"; Longitude 114° 44' 30"
Current profile frequency: 6 hours
Collection began: May 2011

Accessibility FOIA Privacy Policies and Notices

U.S. Department of the Interior | U.S. Geological Survey
URL: http://nevada.usgs.gov/water/et/index.htm
Page Contact Information: Nevada Water Science Center Web Team
Page Last Modified: September 5, 2014

USA.gov
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(http://nevada.usgs.gov/water/lmqw/data_boulder.htm)

USGS Nevada Water Science Center — Water–Quality Monitoring at Lake Mead - Internet Explorer

http://nevada.usgs.gov/water/lmqw/boulder_profileplots.cfm

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Boulder Basin

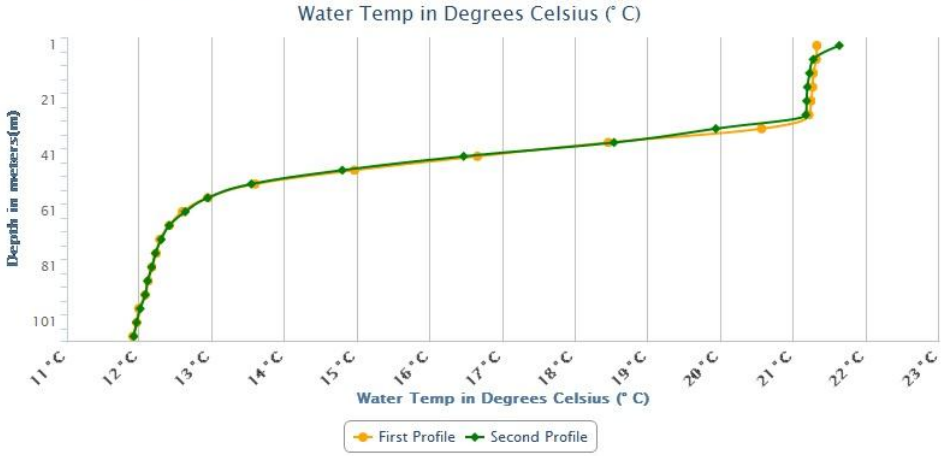
Profile Plots

Data Table

[All data are provisional and subject to revision.]

First Profile (orange line ——)
Date: 11/08/14
Time: 12:03:00 AM

Second Profile (green line ——)
Date: 11/08/14
Time: 12:03:00 PM



BBMS_WaterQuality_ByProfile_WaterYear2011.xls [Read-Only] [Compatibility Mode] - Microsoft Excel

Quality Assured U.S. Geological Survey (USGS) Water-Quality Data, Boulder Basin Monitoring Station, Water Year 2011 (October 1, 2010 - September 30, 2011)

Year	Month	Day	Time (PST)	Depth (m)	Depth QA Rating	Temperature (°C)	Temperature QA Rating	Specific conductance (µS/cm)	Specific conductance QA Rating	Di o (
2011	9	30	1203	0.9	Excellent	26.9	Excellent	1000	Excellent	
2011	9	30	1206	5.9	Excellent	26.7	Excellent	1010	Excellent	
2011	9	30	1210	11.0	Excellent	26.2	Excellent	994	Excellent	
2011	9	30	1214	16.0	Excellent	21.4	Excellent	823	Excellent	
2011	9	30	1217	20.9	Excellent	20.4	Excellent	827	Excellent	
2011	9	30	1221	26.0	Excellent	19.4	Excellent	841	Excellent	
2011	9	30	1224	31.0	Excellent	18.5	Excellent	873	Excellent	
2011	9	30	1228	36.0	Excellent	17.6	Excellent	904	Excellent	
2011	9	30	1231	40.9	Excellent	16.5	Excellent	900	Excellent	
2011	9	30	1235	46.0	Excellent	15.4	Excellent	906	Excellent	
2011	9	30	1239	50.9	Excellent	14.4	Excellent	902	Excellent	
2011	9	30	1242	55.9	Excellent	13.2	Excellent	902	Excellent	
2011	9	30	1246	61.1	Excellent	12.4	Excellent	897	Excellent	
2011	9	30	1250	66.0	Excellent	12.1	Excellent	898	Excellent	
2011	9	30	1253	71.1	Excellent	11.9	Excellent	900	Excellent	
2011	9	30	1257	76.0	Excellent	11.8	Excellent	902	Excellent	
2011	9	30	1301	81.0	Excellent	11.8	Excellent	903	Excellent	
2011	9	30	1305	86.0	Excellent	11.7	Excellent	902	Excellent	
2011	9	30	1308	91.0	Excellent	11.7	Excellent	904	Excellent	
2011	9	30	1312	96.0	Excellent	11.6	Excellent	906	Excellent	
2011	9	30	1316	101.0	Excellent	11.6	Excellent	907	Excellent	
2011	9	30	1320	106.0	Excellent	11.6	Excellent	909	Excellent	
2011	9	30	1324	111.0	Excellent	11.5	Excellent	912	Excellent	
2011	9	30	1803	0.9	Excellent	26.8	Excellent	1010	Excellent	
2011	9	30	1806	6.0	Excellent	26.7	Excellent	1010	Excellent	
2011	9	30	1810	11.0	Excellent	26.4	Excellent	1000	Excellent	
2011	9	30	1814	15.9	Excellent	21.2	Excellent	813	Excellent	
2011	9	30	1817	21.2	Excellent	20.2	Excellent	825	Excellent	

BBMS_1 - 111 Meters

Boulder Basin Monitoring Station

Median Temperatures
By
Depth-Dependent Profiles

Explanation of following graphs:

Lake Stage ——
Median Temperature (degrees Celsius) ——
Intakes 1 & 2 ····
Intake 3 ----
Lake Bottom — · ·

Note—Stage, Intake Levels, and Bottom are Approximations

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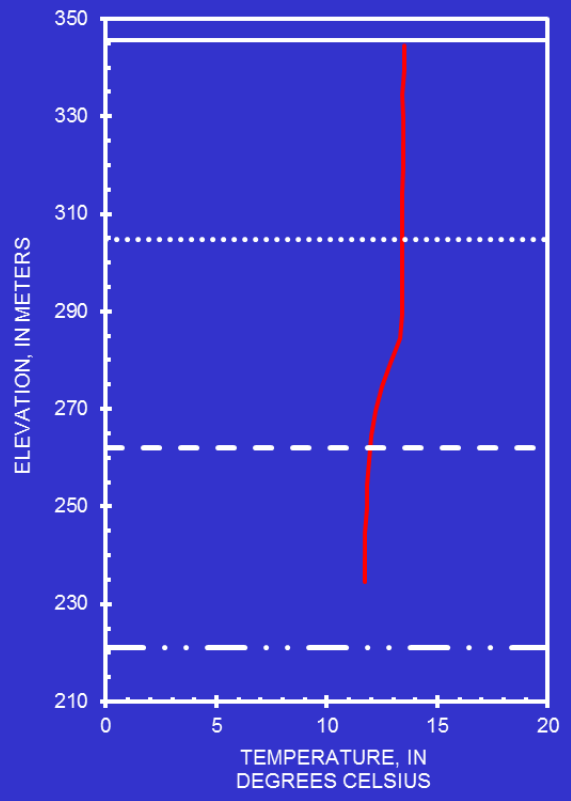
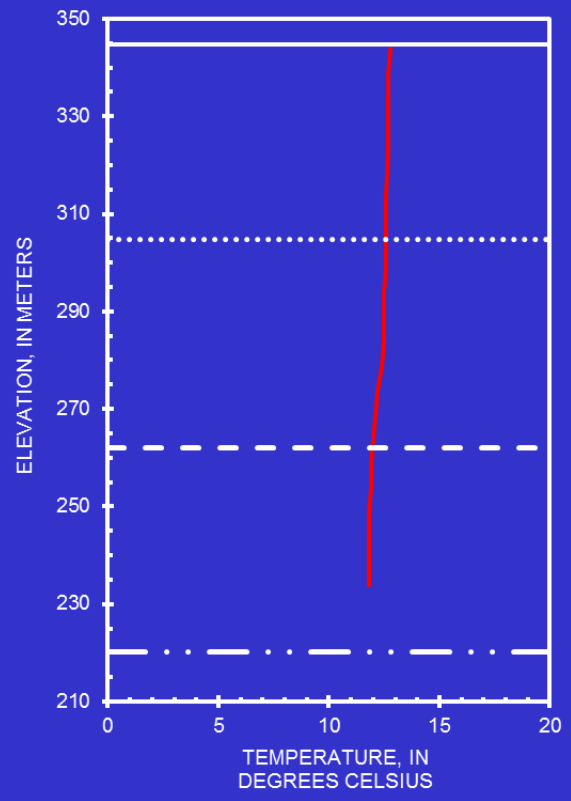
Jan 2012



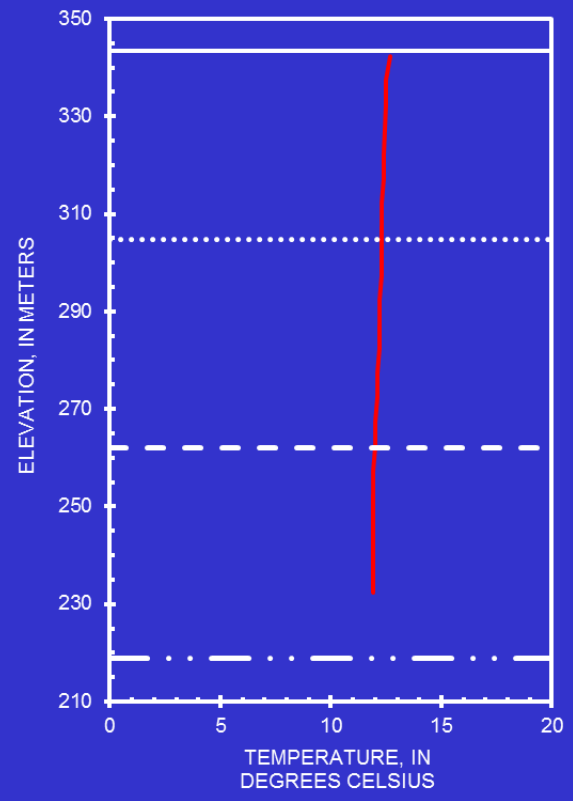
Median = 12.9
(min = 11.6/max = 14.4)

Feb 2012



Median = 12.5
(min = 11.7/max = 13.7)

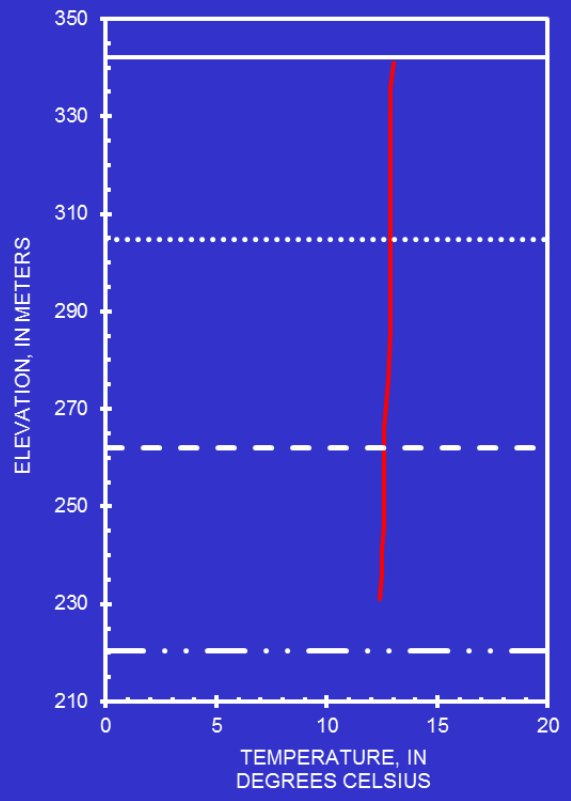
Mar 2012



Median = 12.2
(min = 11.7/max = 14.9)

Provisional Data—Subject to Review/Revision

Jan 2013



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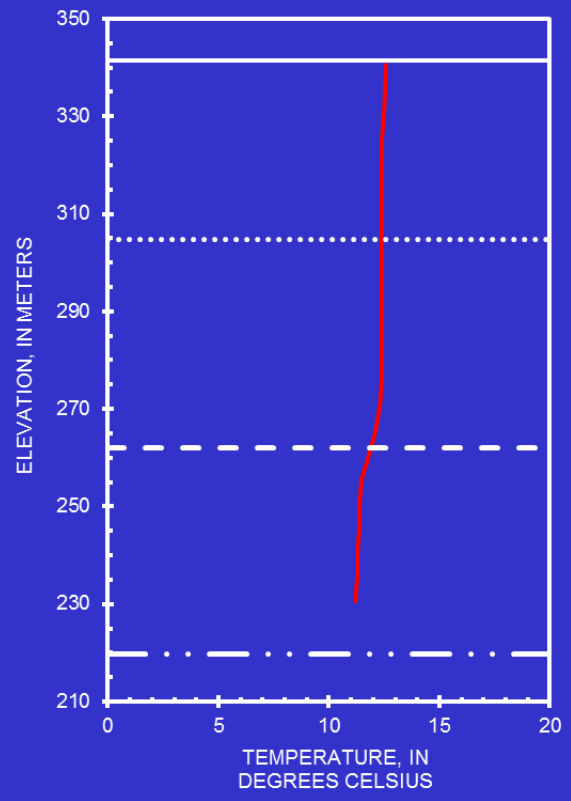
(min = 12.1/max = 14.4)

Feb 2013



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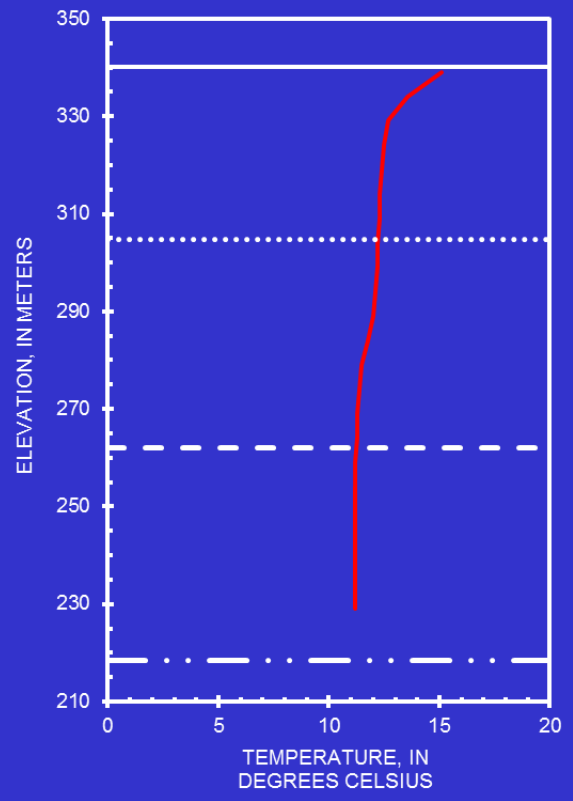
(min = 11.1/max = 13.6)

Mar 2013



Median = 11.8
(min = 11.1/max = 18.1)

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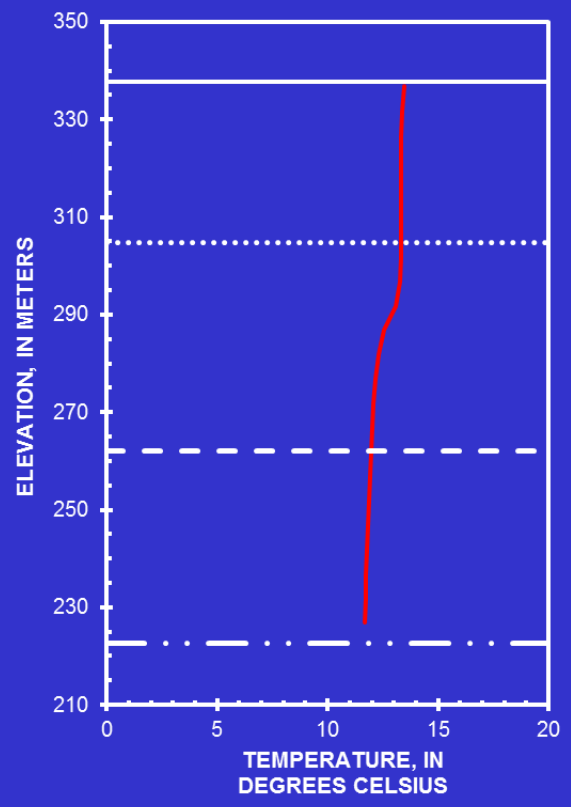
Jan 2014



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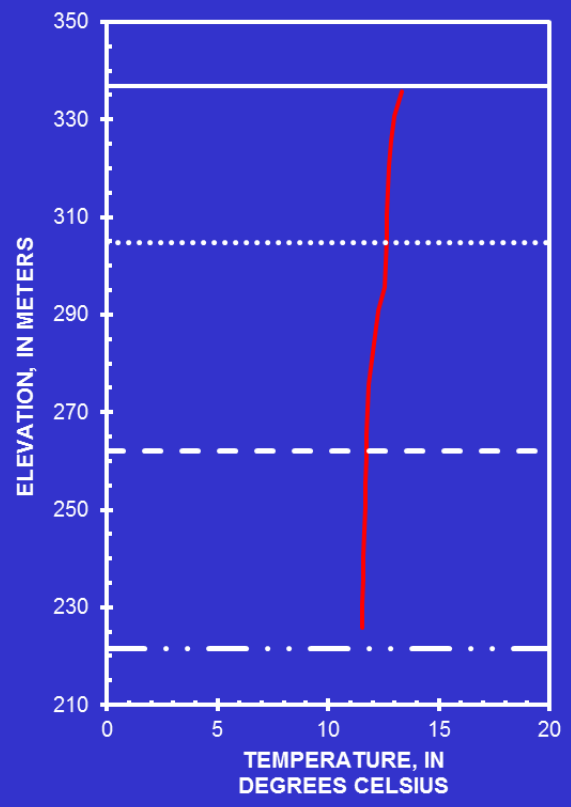

Median = 12.6
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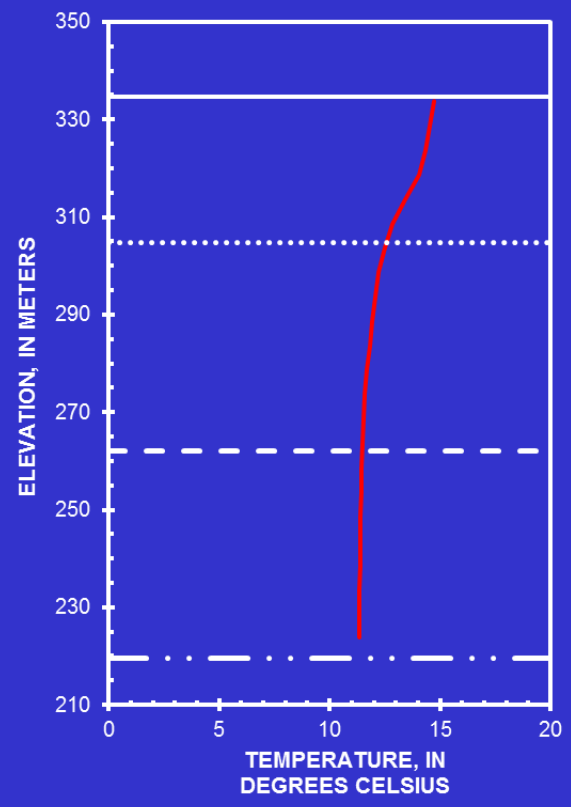

Median = 12.6
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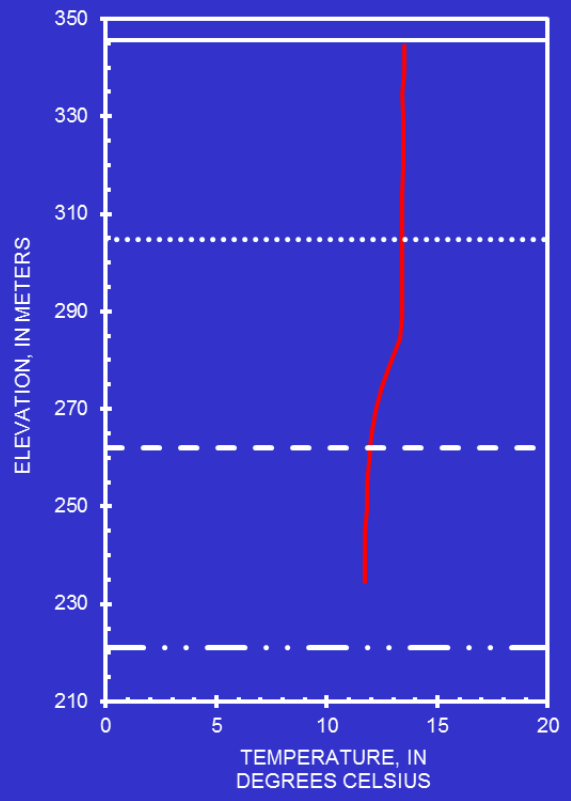
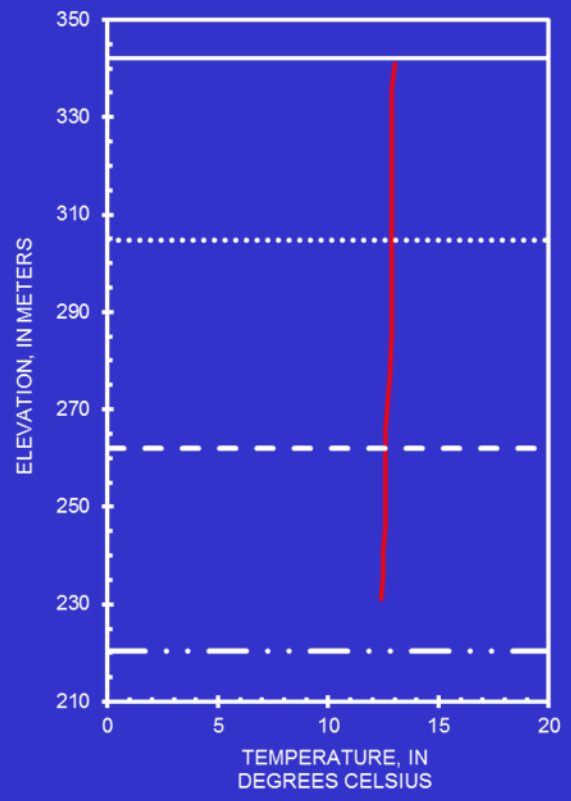


Median = 12.9
(min = 11.6/max = 14.4)

Jan 2013



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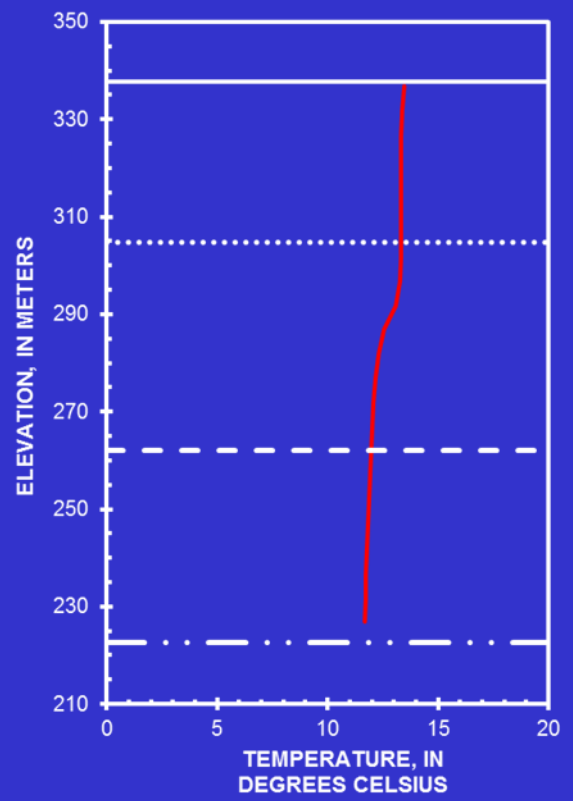

Median = 12.2
(min = 11.3 /max = 14.5)

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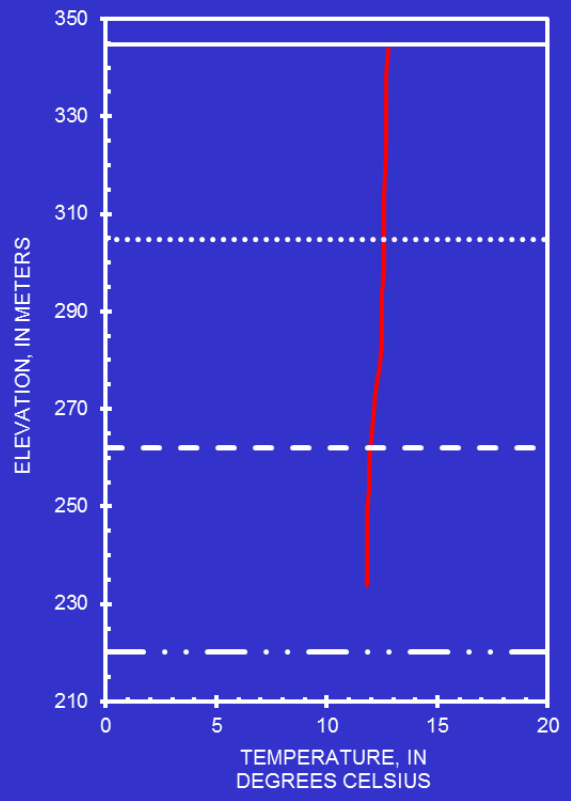

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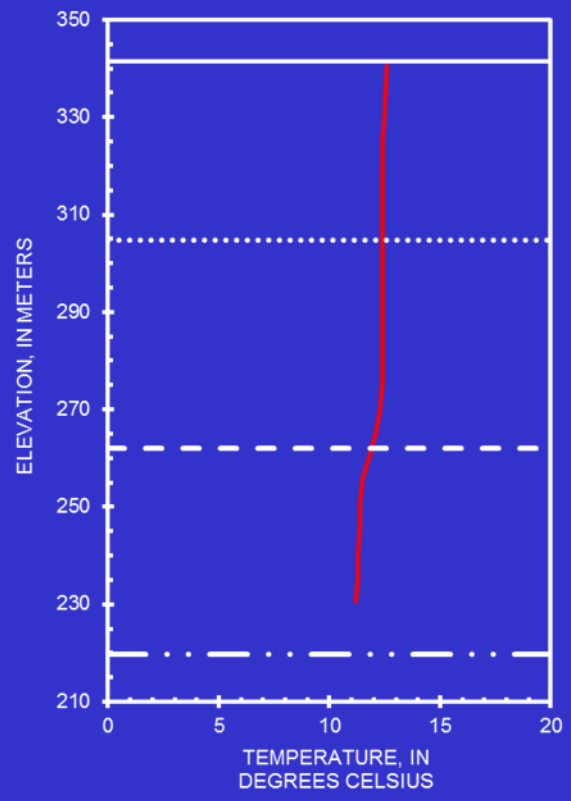
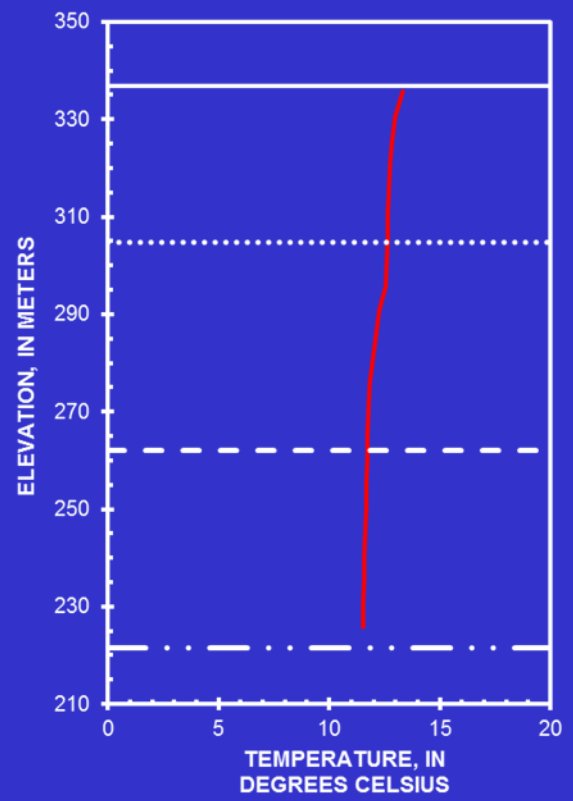
Feb 2013



Median = 12.4
(min = 11.1/max = 13.6)

Feb 2014



Median = 12.6
(min = 11.5 /max = 14.8)

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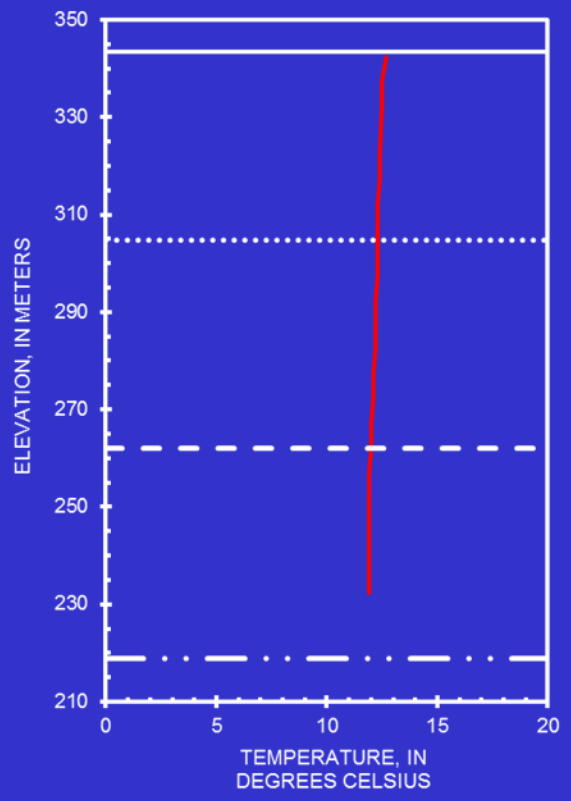
Mar 2012



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(min = 11.7/max = 14.9)

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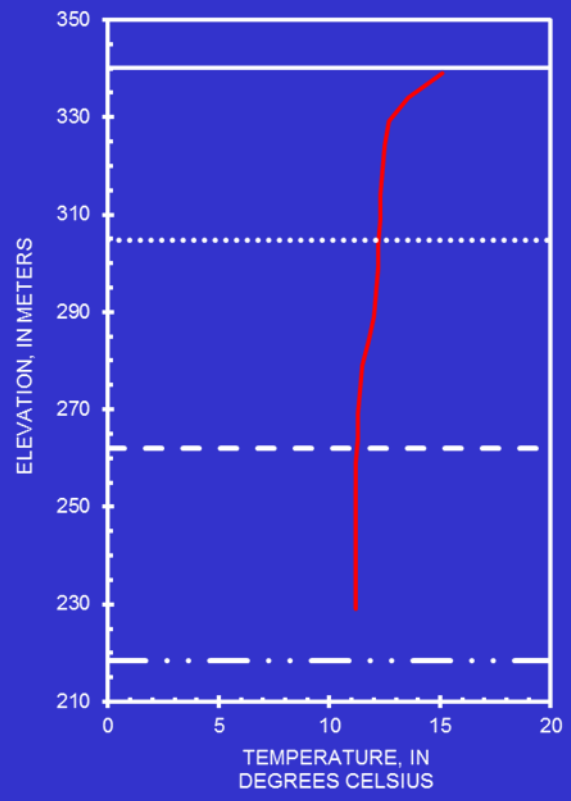
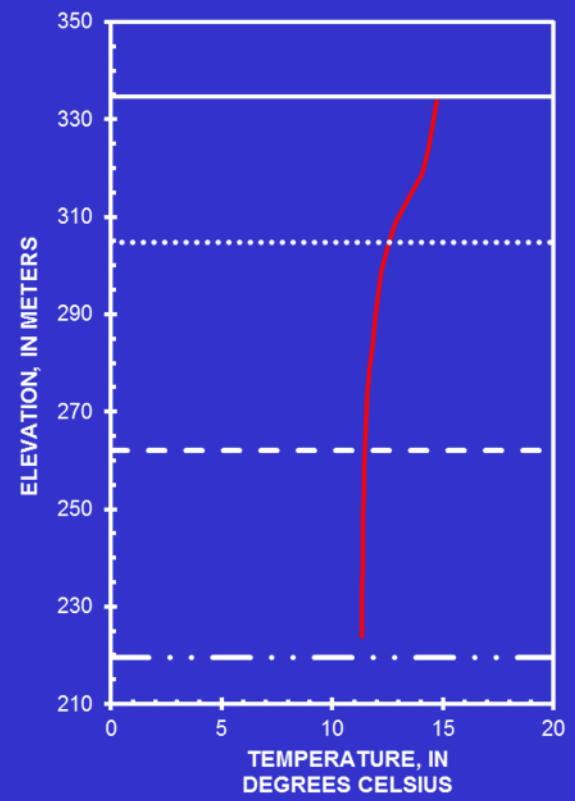


Median = 11.8
(min = 11.1/max = 18.1)

Mar 2014



Median = 12.6
(min = 11.5 /max = 17.6)

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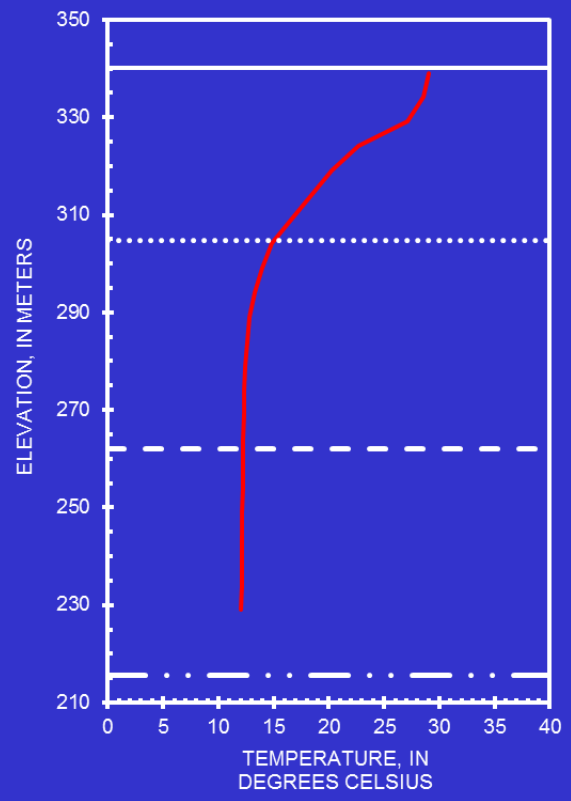
Aug 2012



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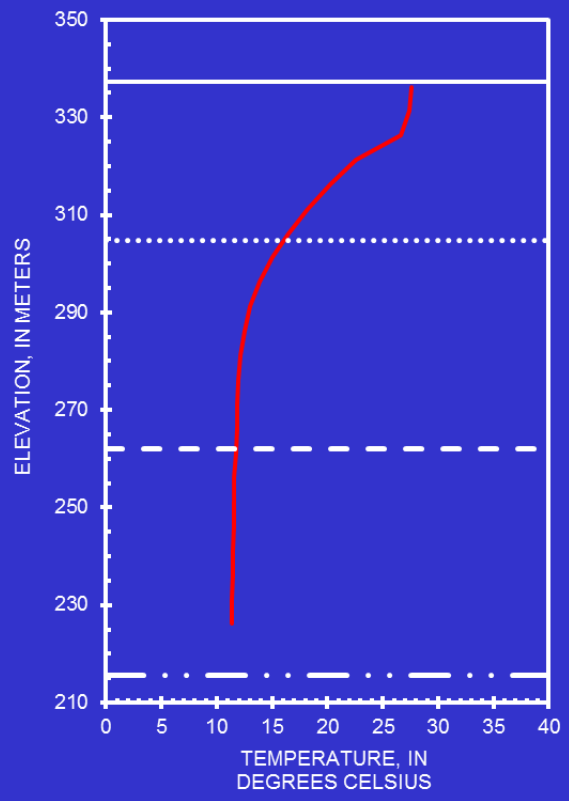

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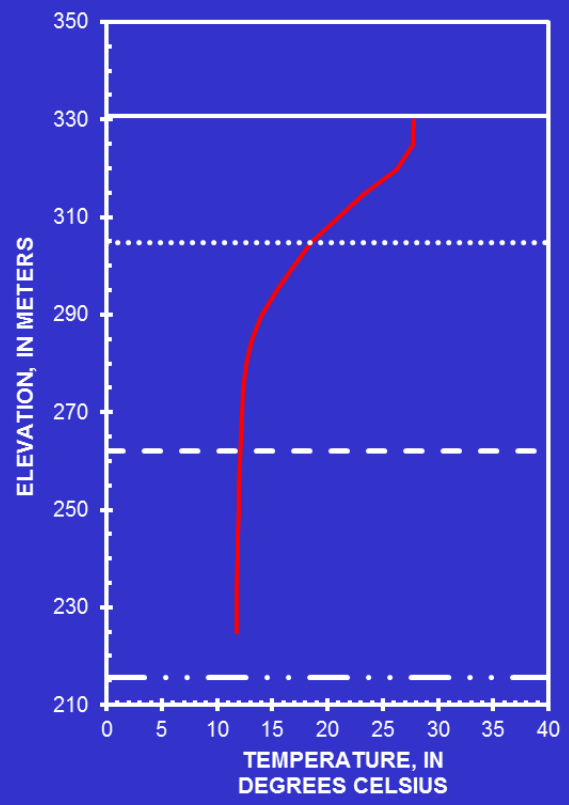
Aug 2014



Median = 12.2
(min = 11.3 /max = 30.0)

Provisional Data—Subject to Review/Revision

USGS Lake Mead water-quality data collected in cooperation with the following:

Southern Nevada Water Authority,
Clark County Water Reclamation District, and
National Park Service

Questions?