

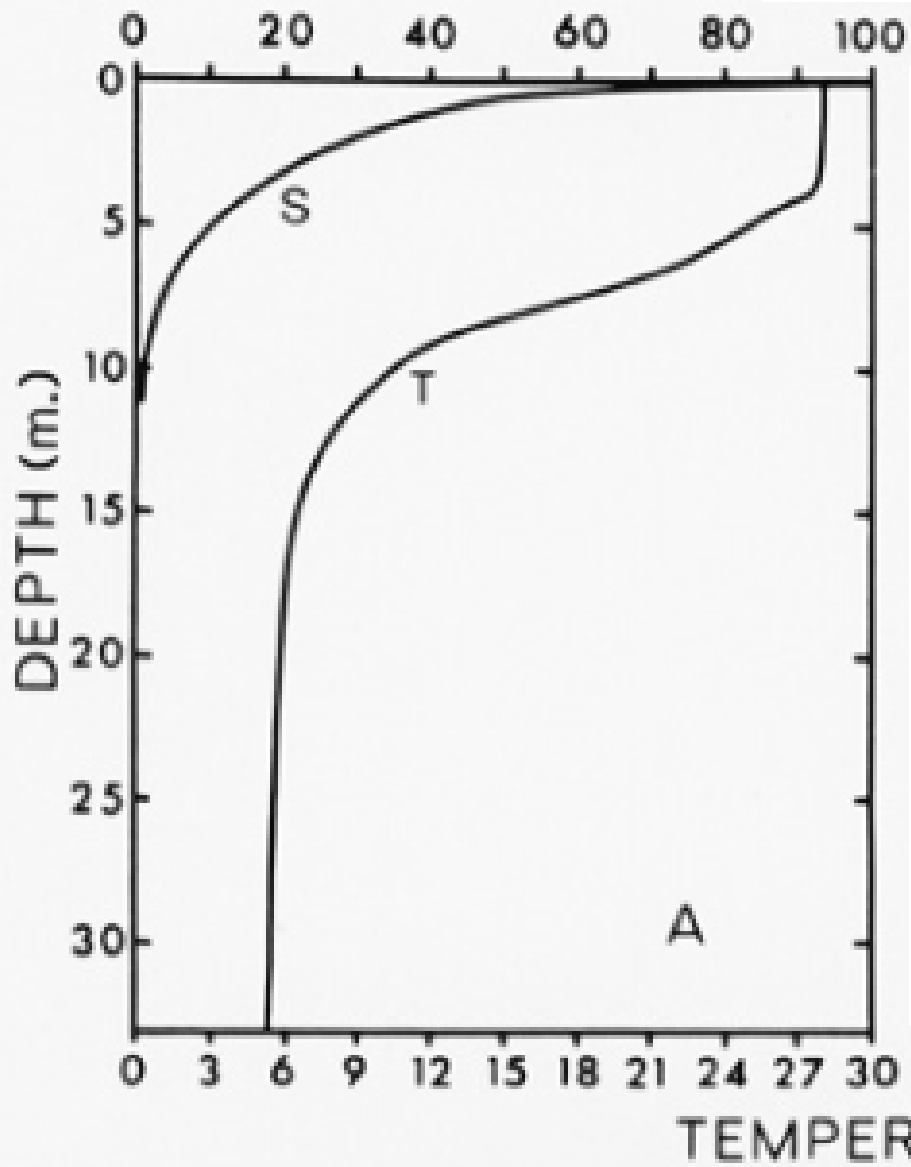
Monitoring Maine Lake Temperatures with Hobo Data Loggers: Greater Understanding through Technology

Daniel E. Buckley

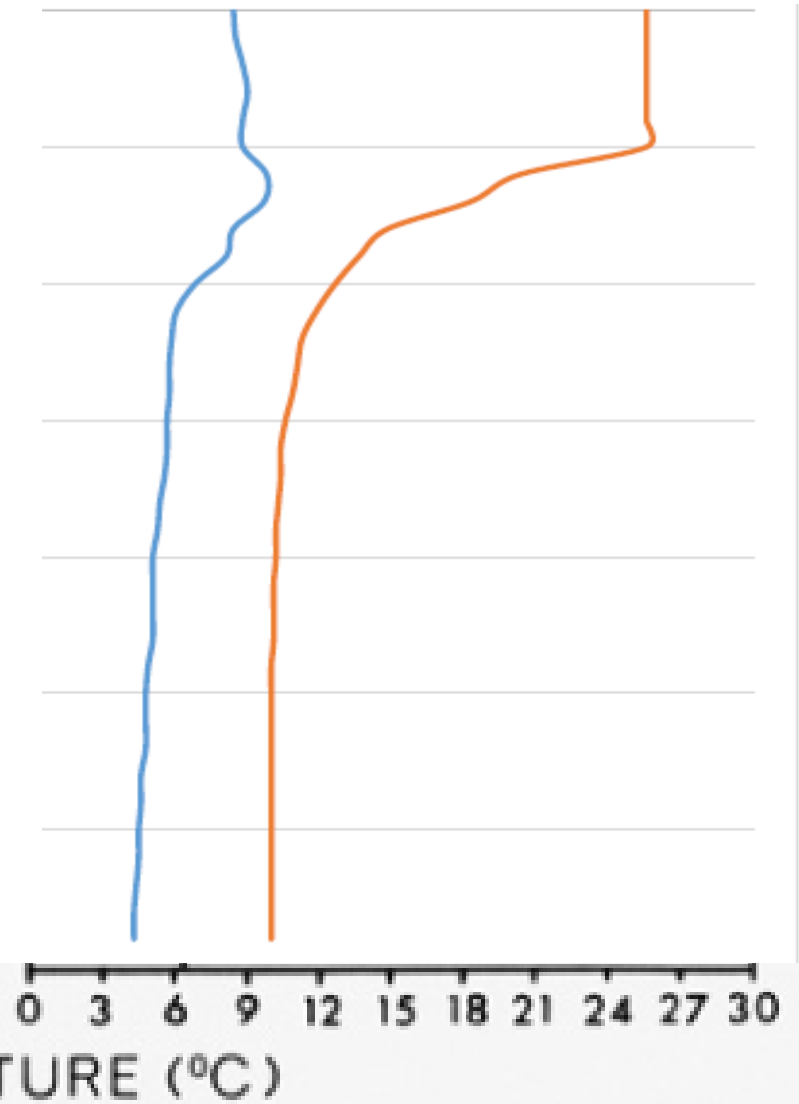
Division of Natural Sciences

University of Maine at Farmington

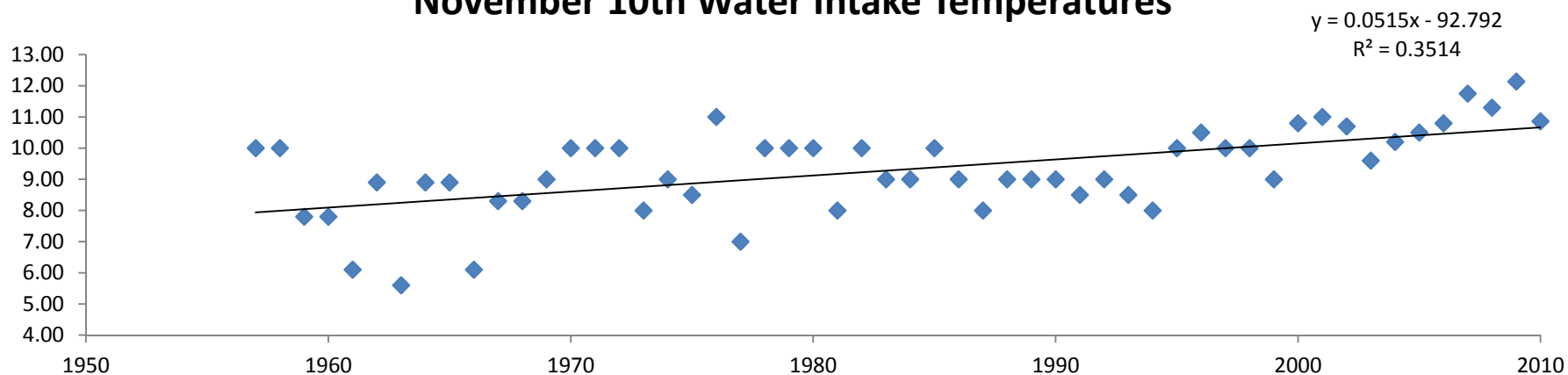




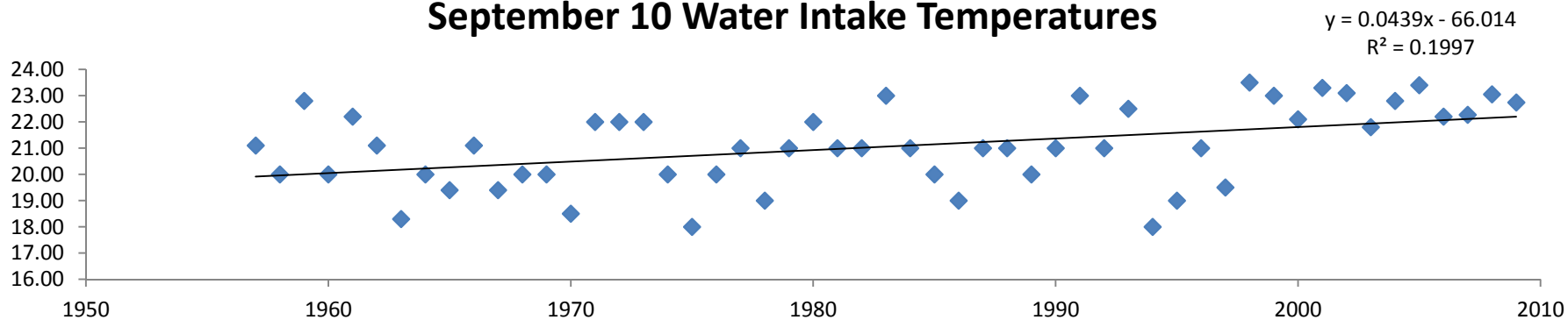
Lake Auburn July 19, 2012



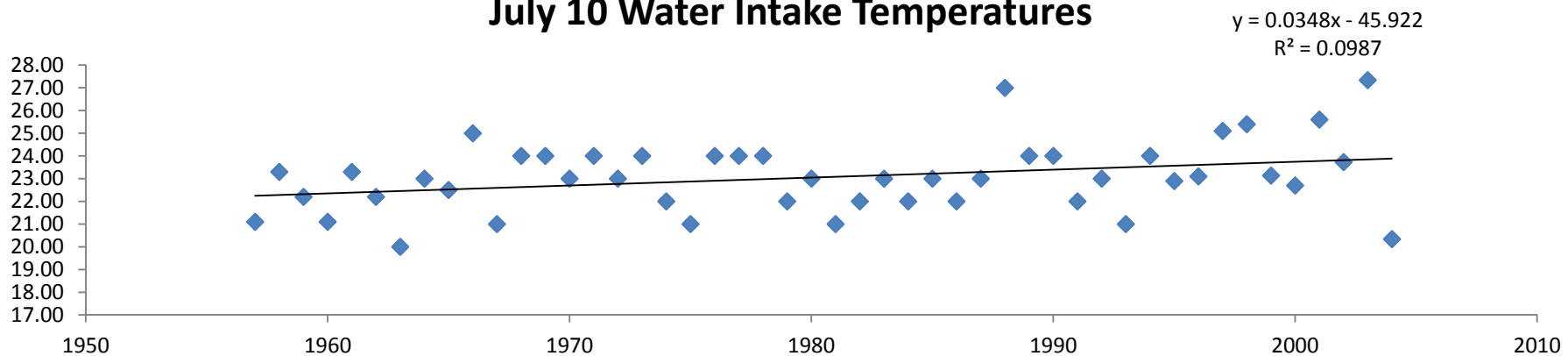
November 10th Water Intake Temperatures



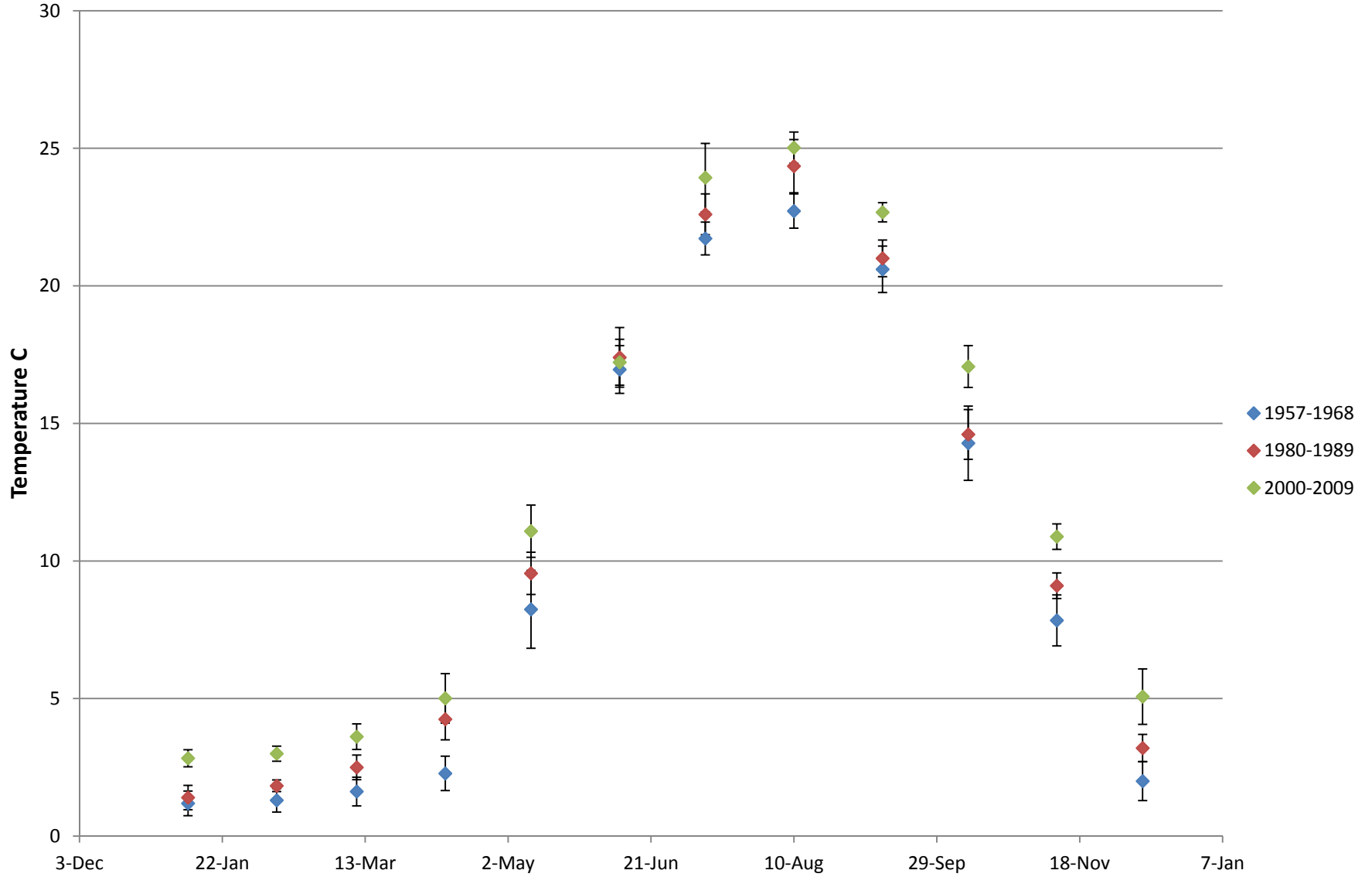
September 10 Water Intake Temperatures



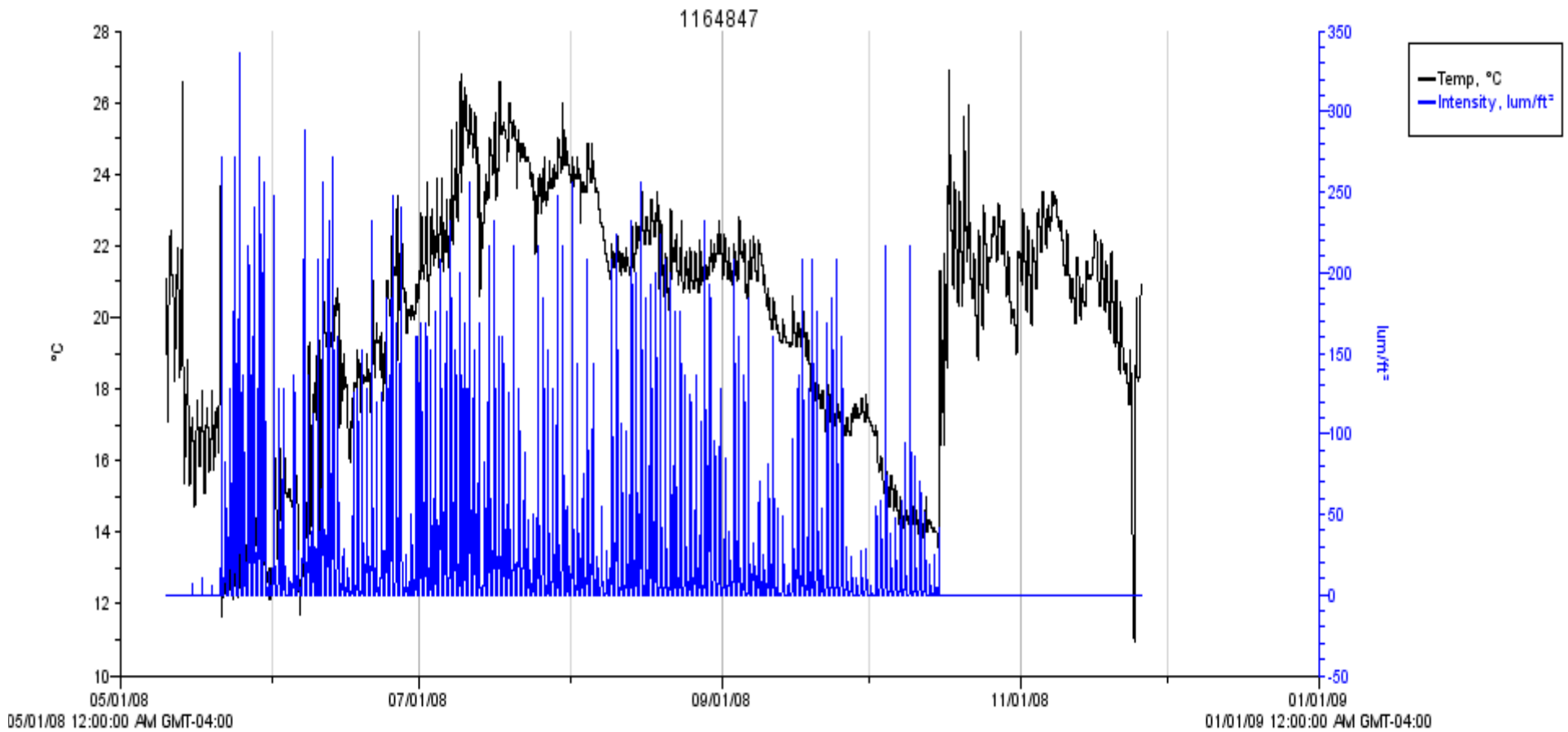
July 10 Water Intake Temperatures



Lake Auburn Water Intake 10 yr Means by Day of the Year



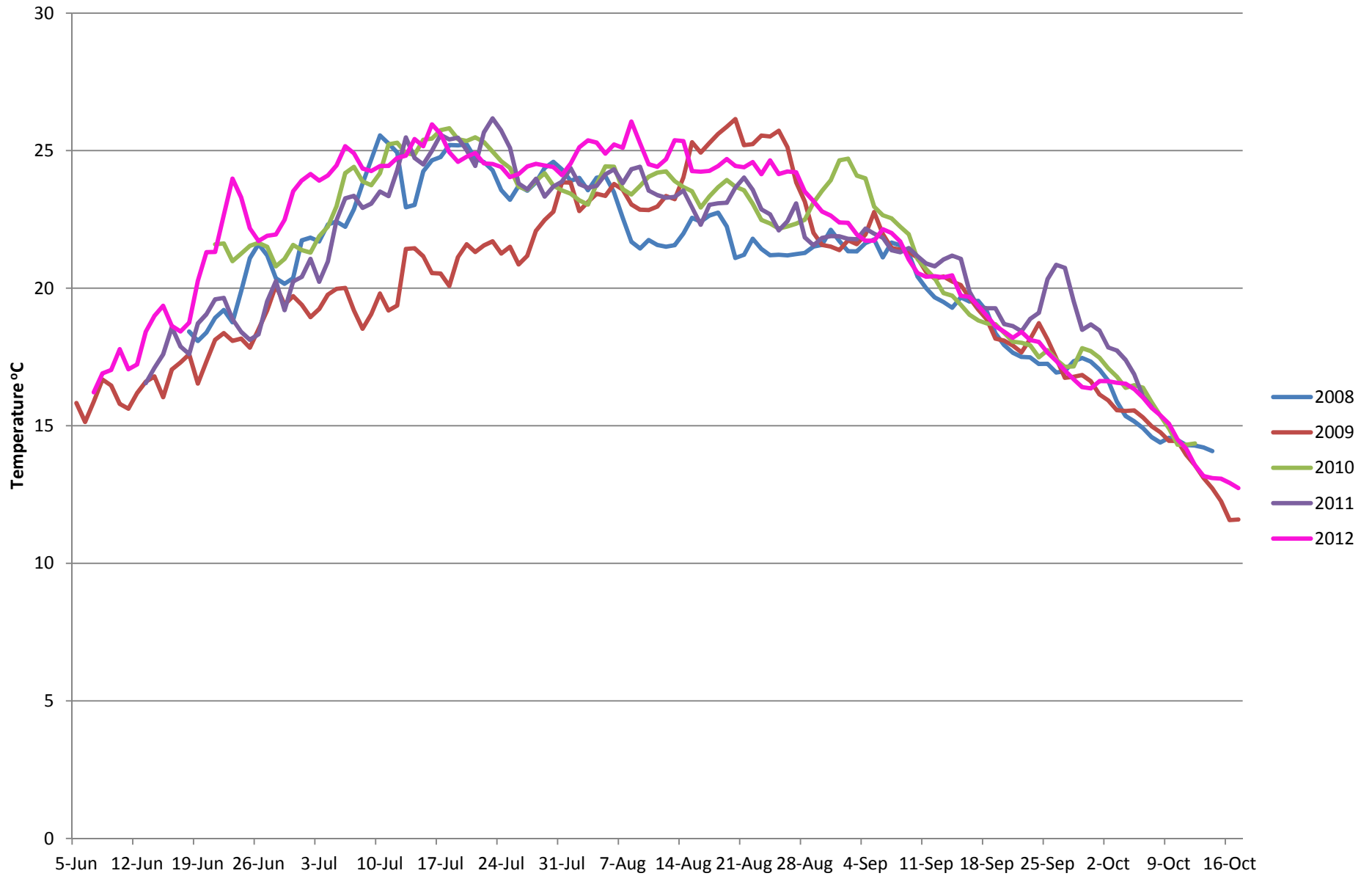
Hobo Data For Emden Pond Summer 2011



Emden Lake Temperatures 2008

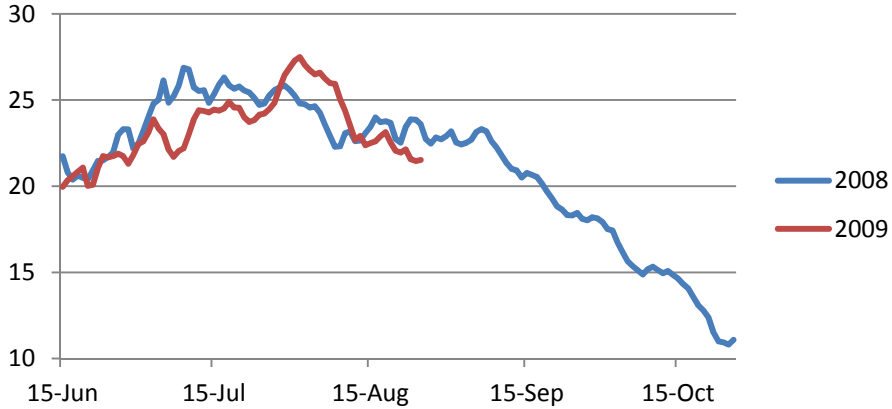


Embden Pond Daily Mean Summer Temperatures 2008 - 2012

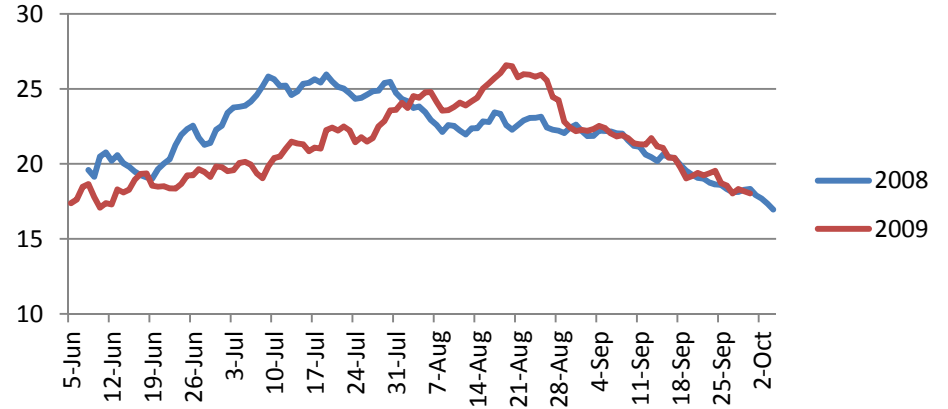


Seasonal Lake Temperature Comparisons for four Maine Lakes

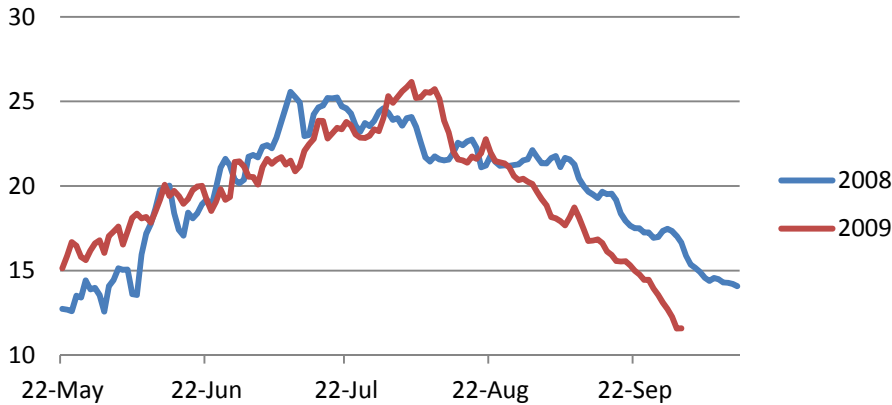
Salmon Lake 2008 and 2009 Daily Average Temperatures



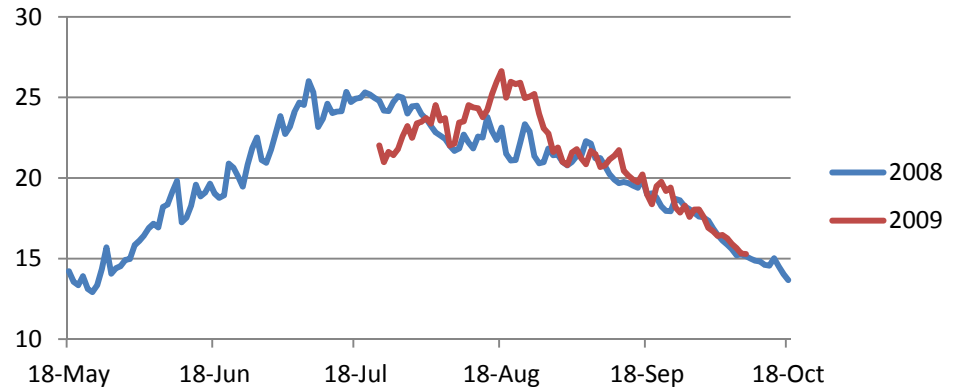
Craig Pond 2008 and 2009 Daily Average Temperatures



Embden Pond 2008 and 2009 Daily Average Temperatures

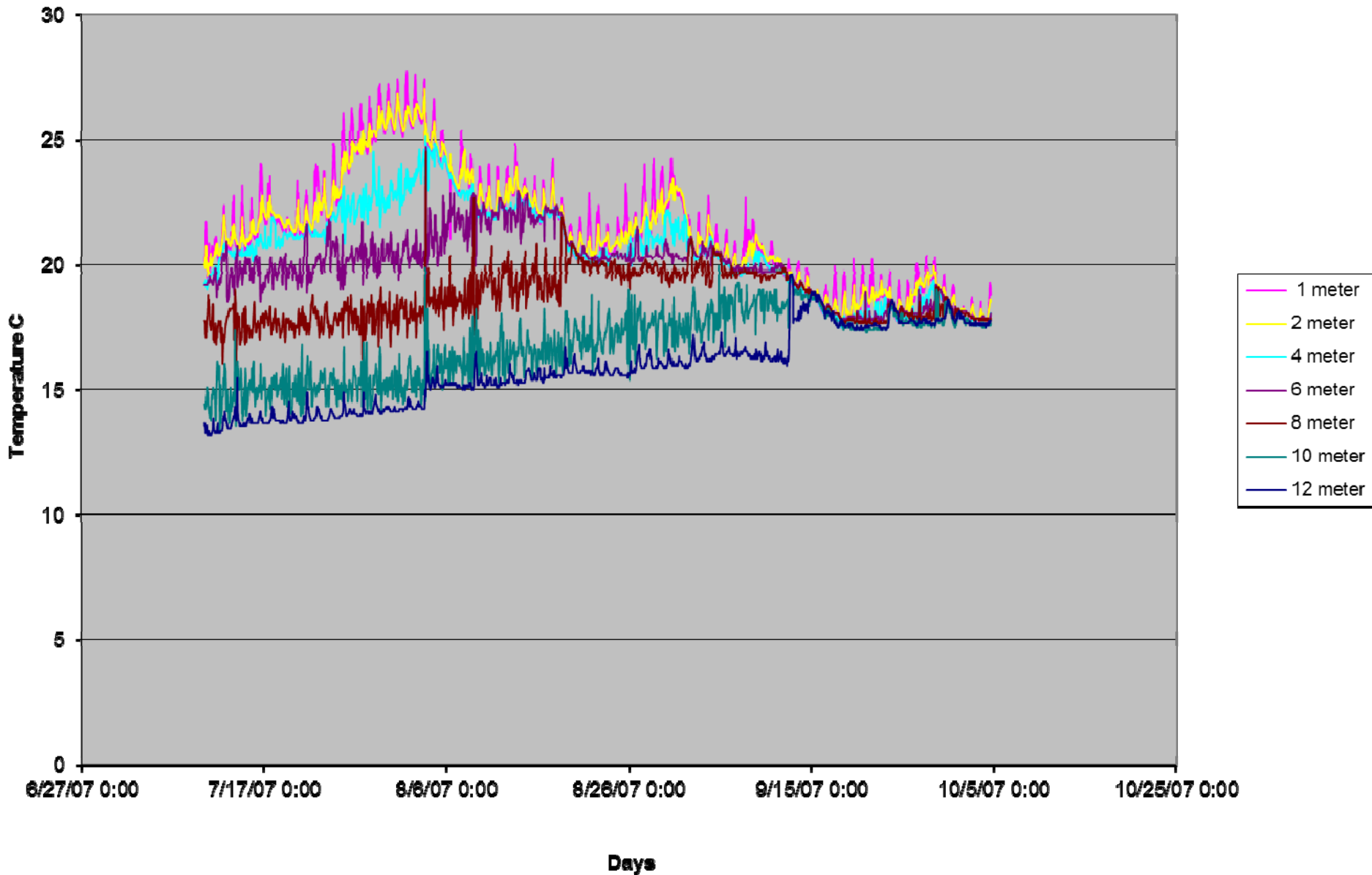


Green Lake 2008 and 2009 Daily Average Temperatures

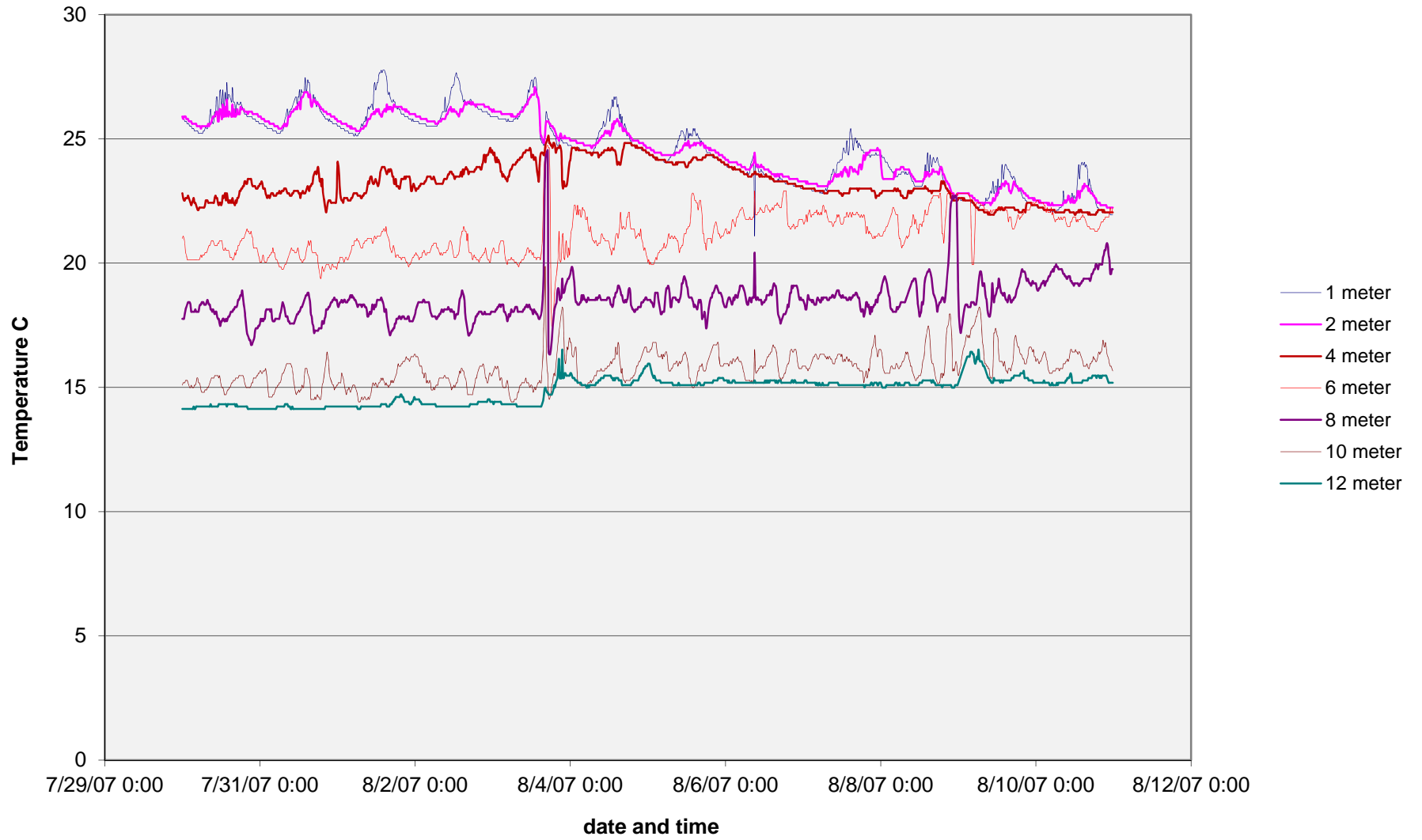




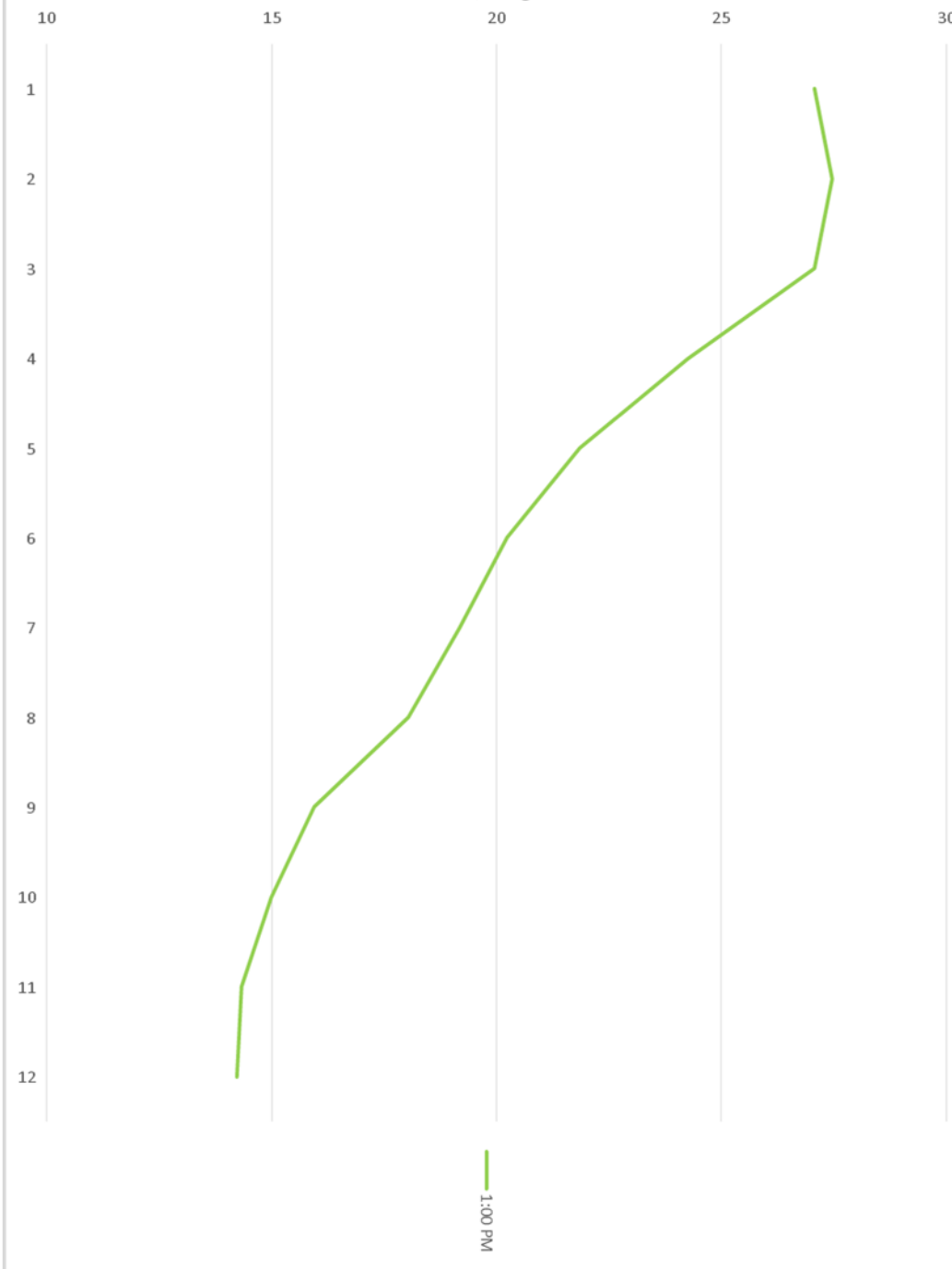
Webb Lake Summer Temps



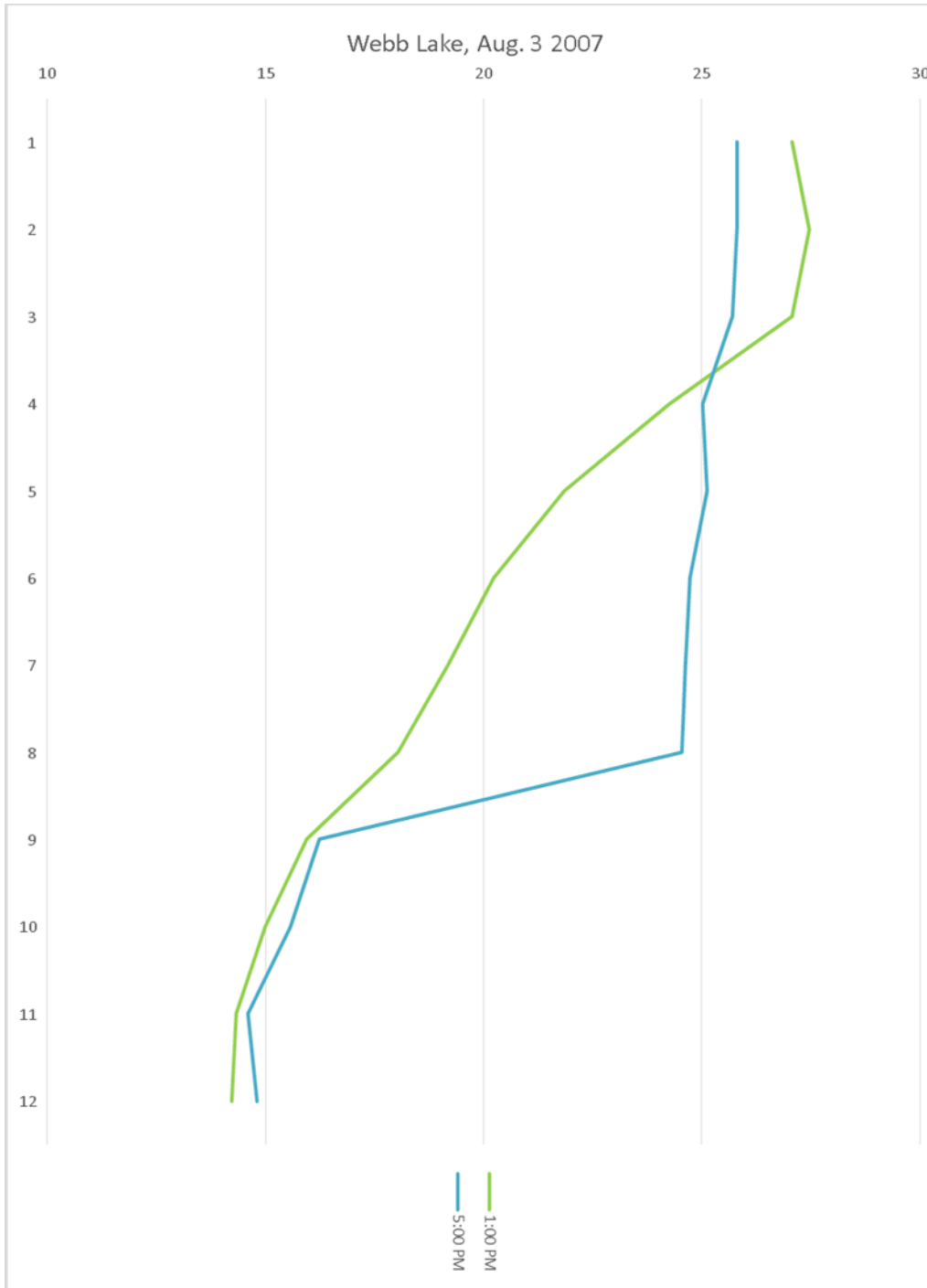
11 days mid summer



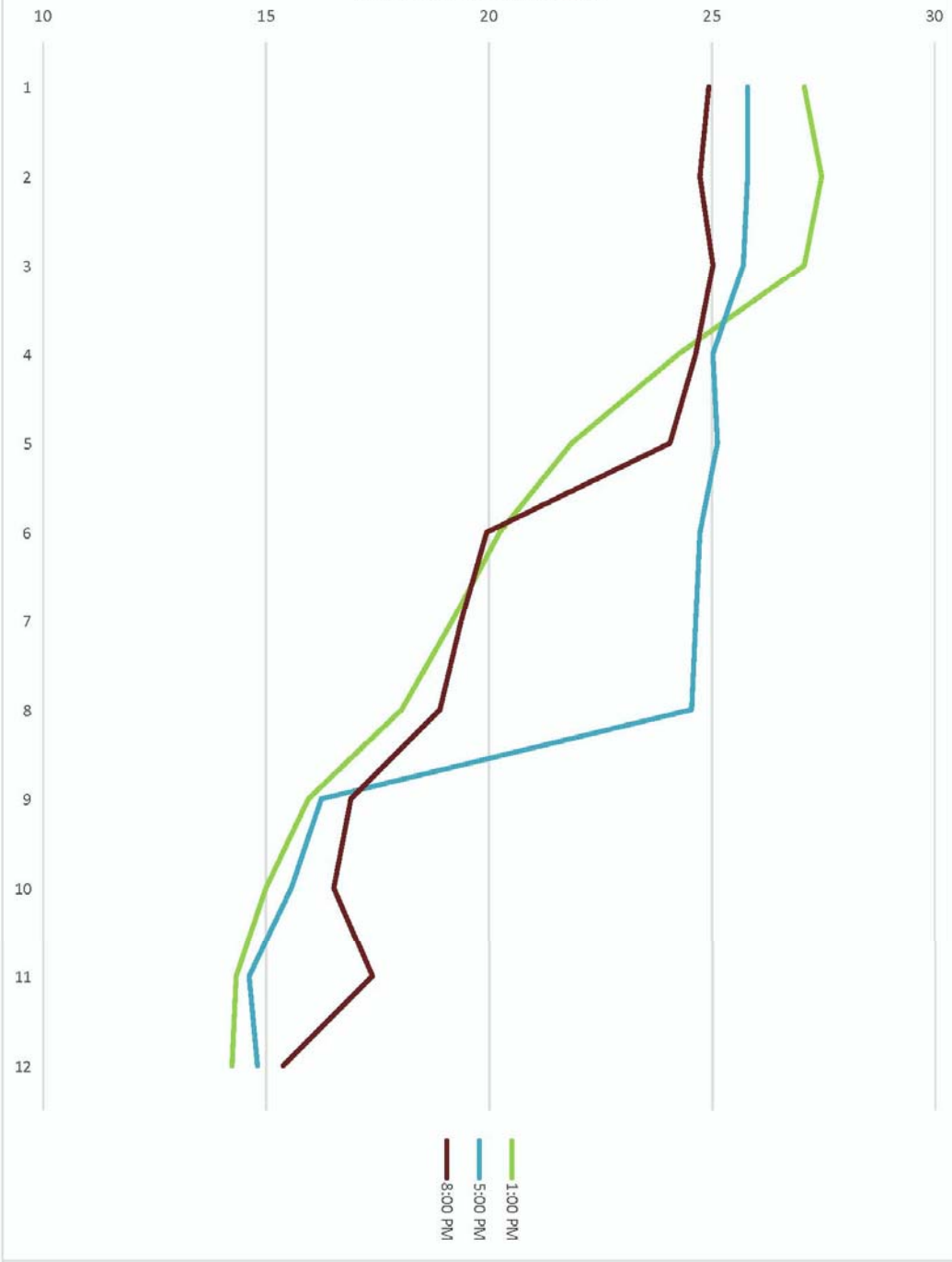
Webb Lake, Aug. 3 2007



Webb Lake, Aug. 3 2007



Webb Lake, Aug. 3 2007

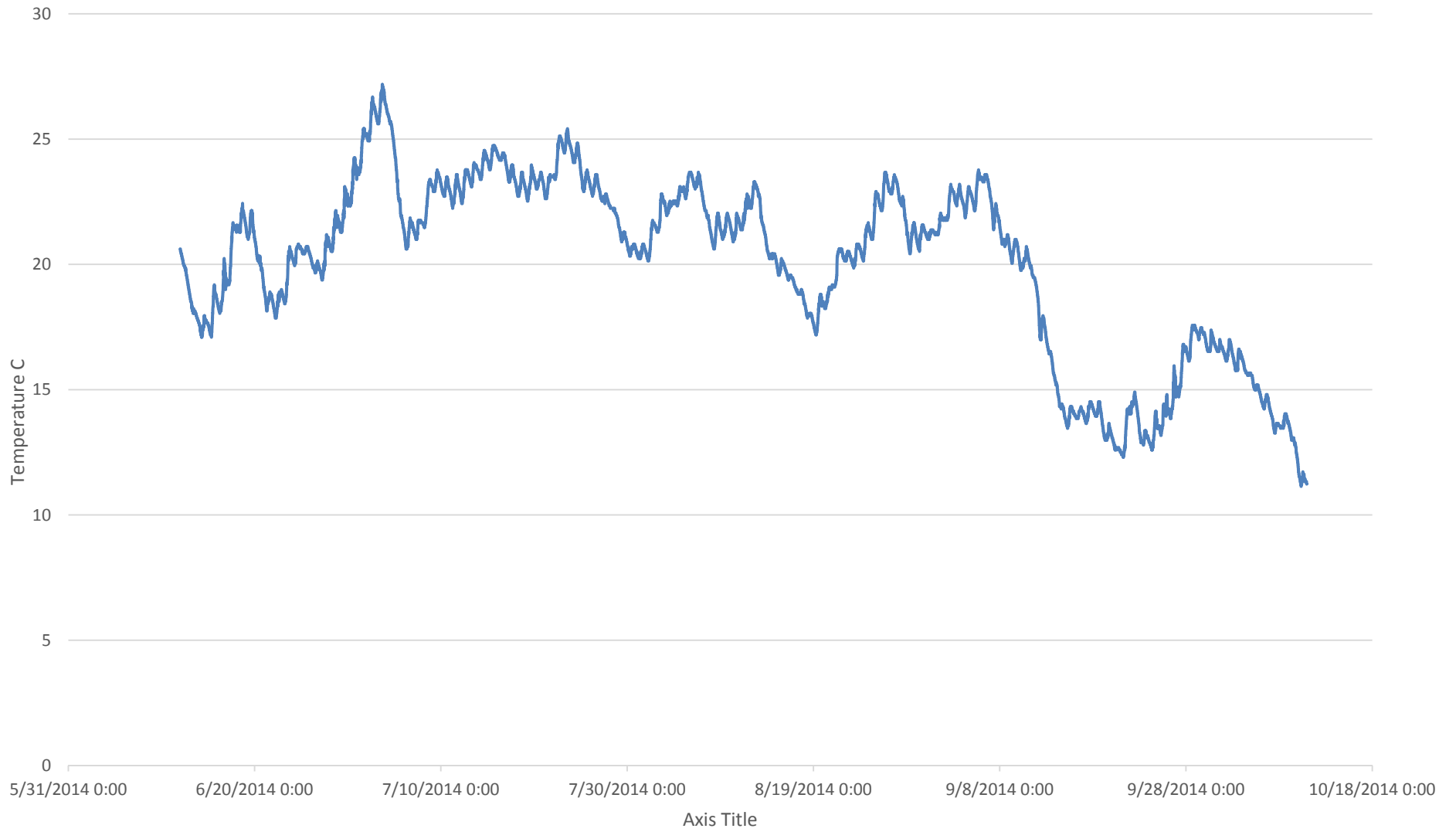




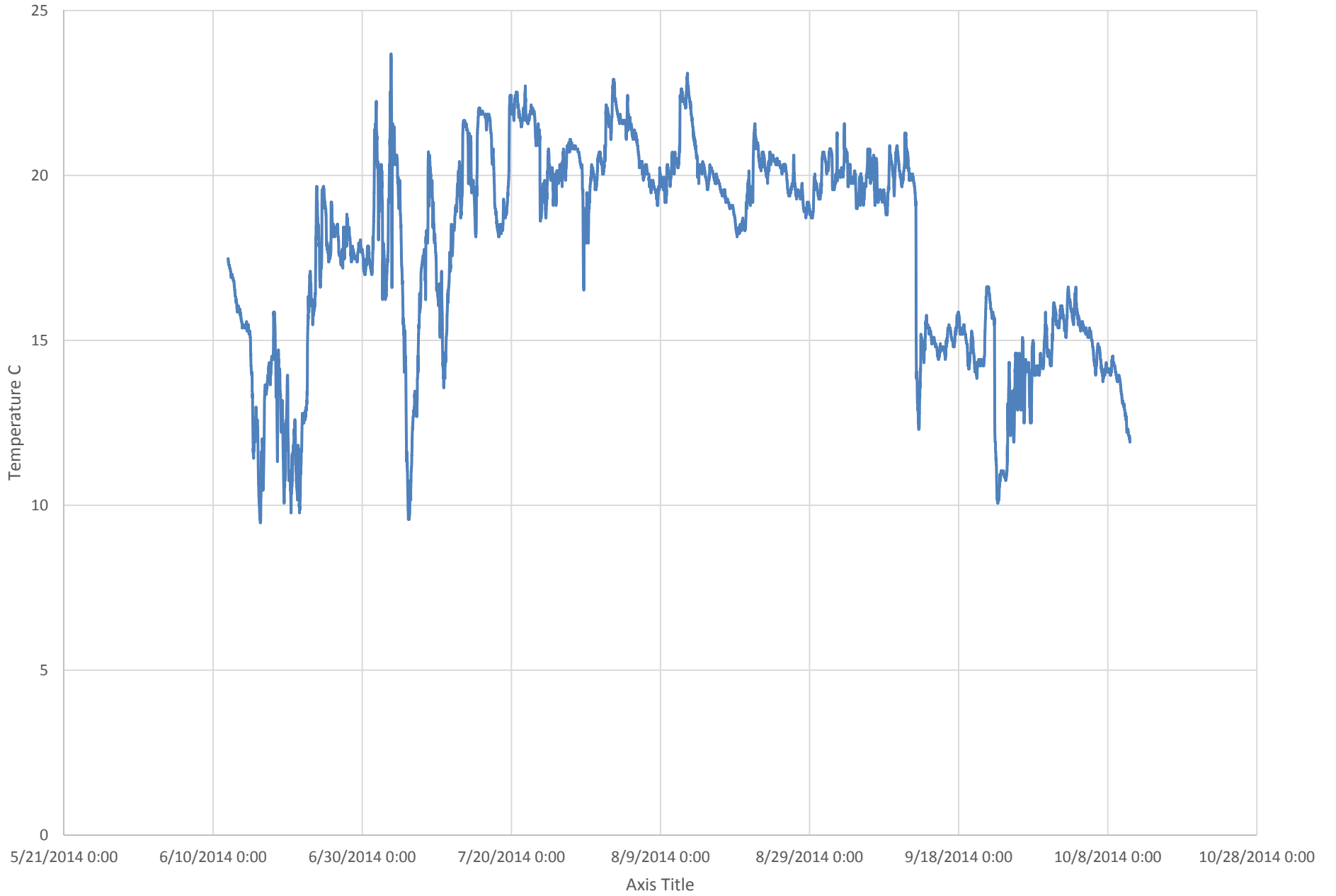
2014. 7.24 21:38

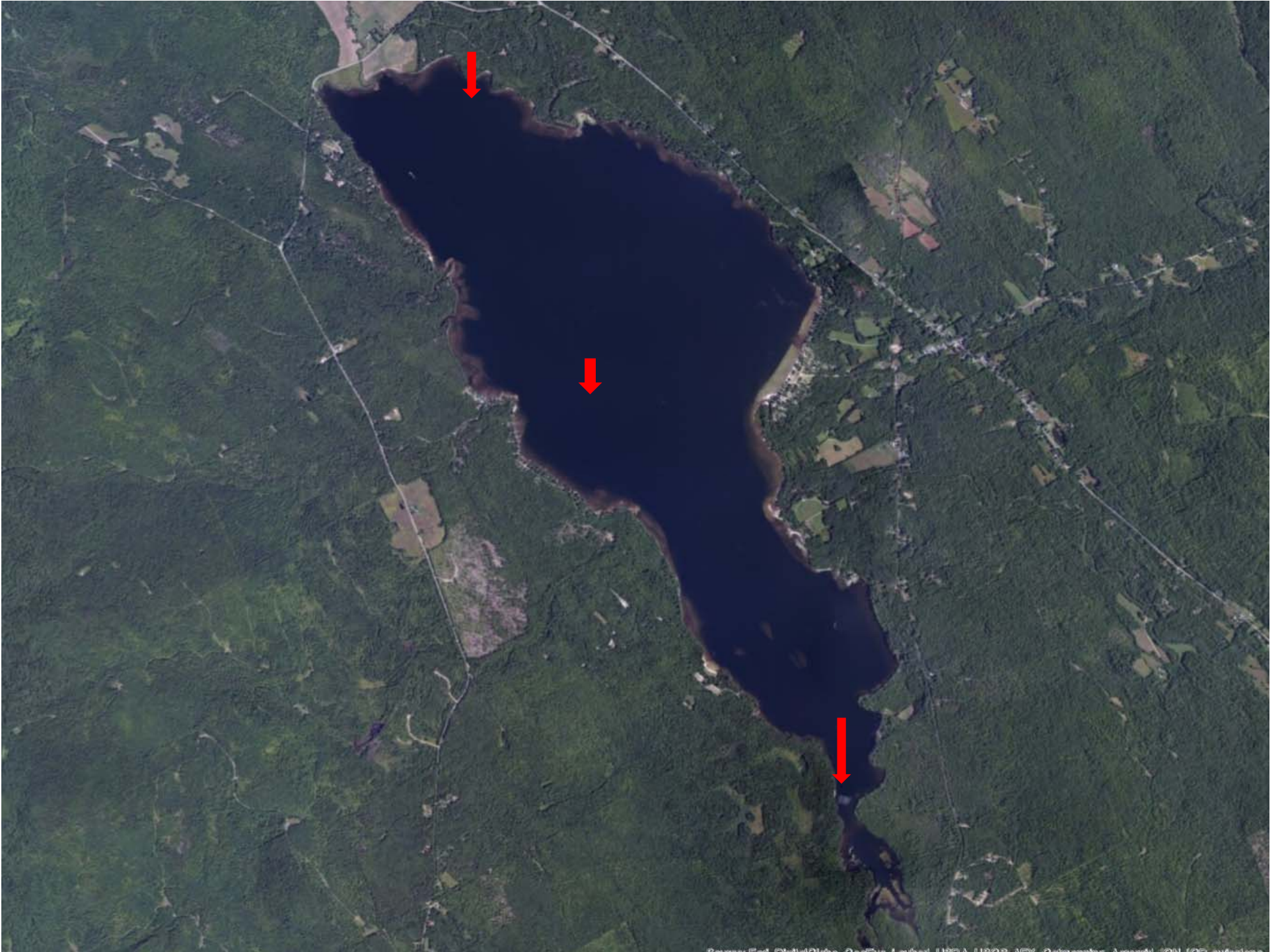


Quimby Pond, 2014

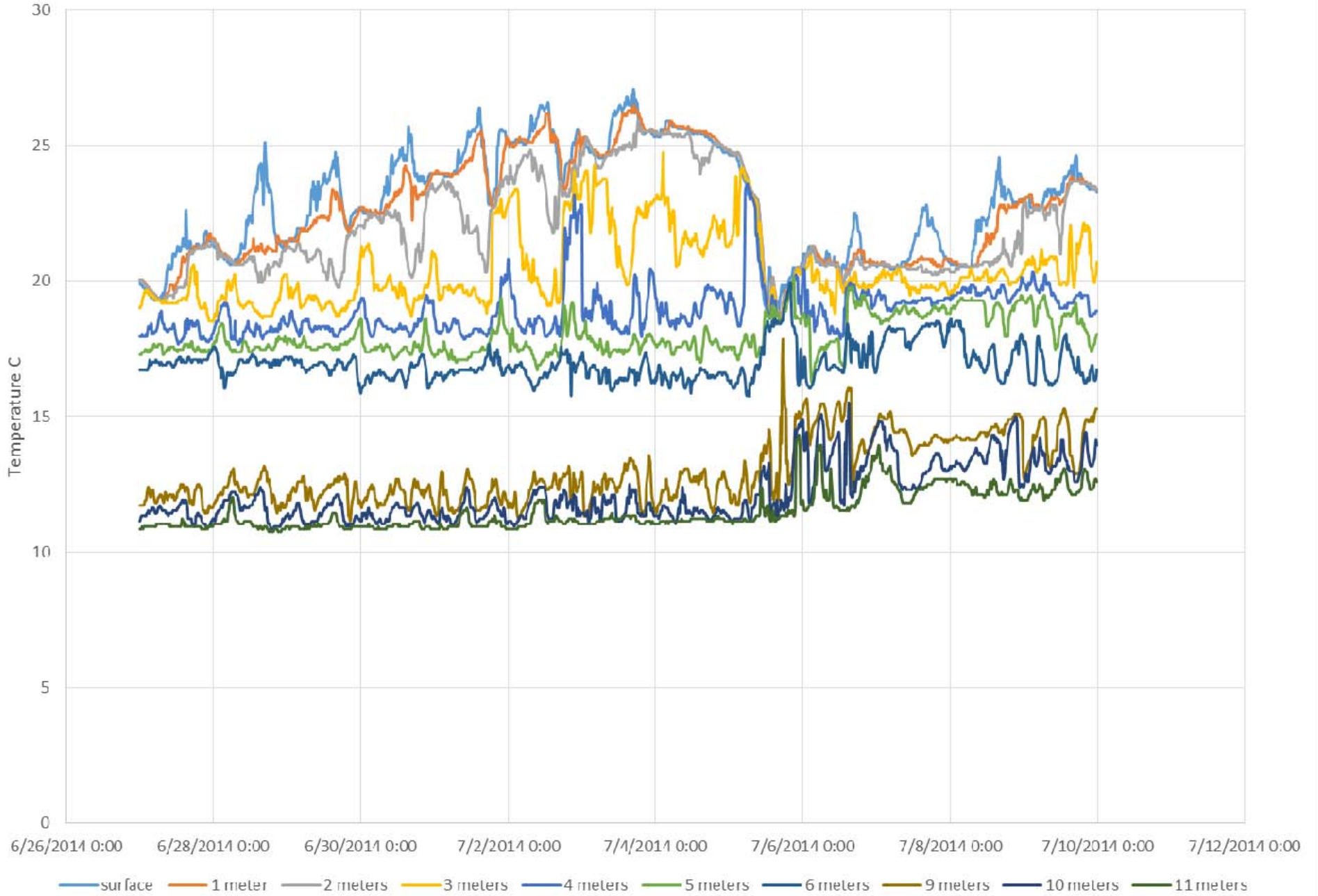


Rangeley Lake, Oquossoc Hobos 2014

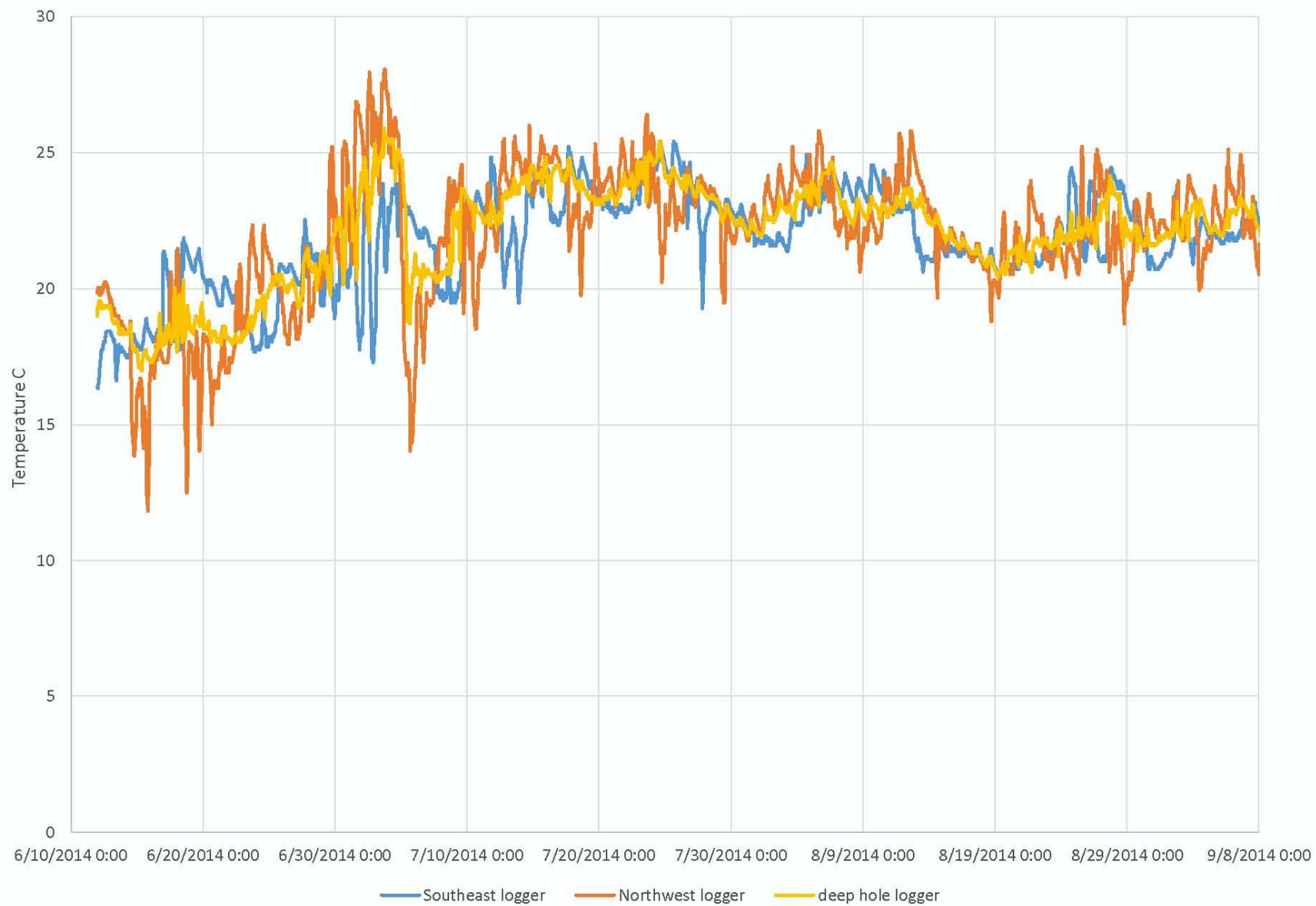




Webb lake June 27 to July 12 2014



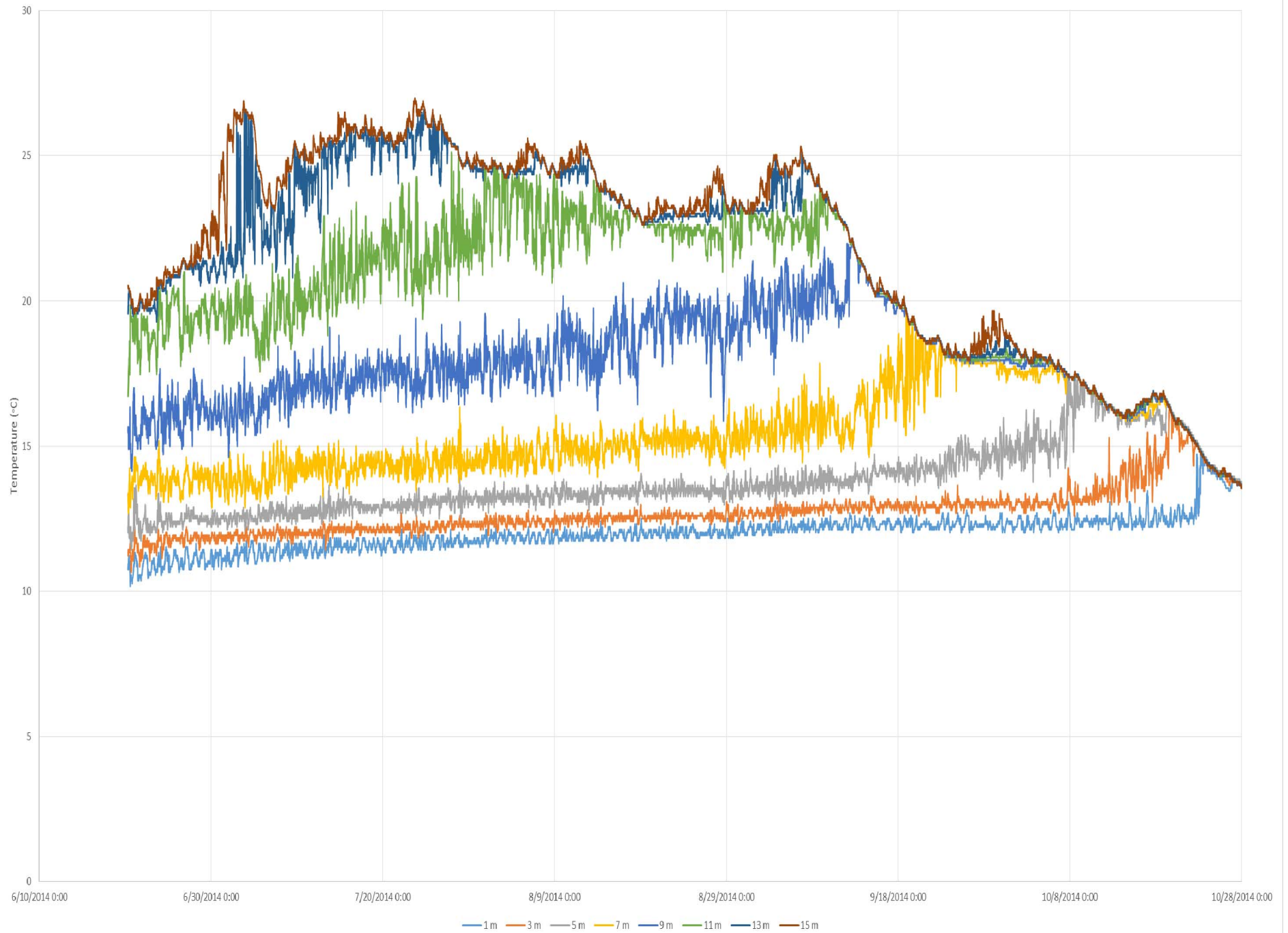
Webb Lake Temperatures at 2 meters



Harrison, ME



Long Pond (North String) Temperature Trends



Lake Temperature Dynamics

- Lakes in Maine have warmed over past 50 years primarily due to longer ice free periods
- Lake heat storage and release is a function of lake basin morphology and orientation as well as weather/climate.
- Temperature fluctuations below 3 to 4 meters are driven more by water movement than the solar signal.
- Significant weather events (storms) can have a large impact upon lake stratification and the annual temperature pattern

Acknowledgements

- I want to thank participating Maine lake associations, concerned members of Maine's lakes communities, The Davis Conservation Fund and the Water Research Institute in conjunction with U.S. Geological Survey for funding to purchase the Hobo pendant loggers used in this study.
- I also wish to thank UMF's Faculty Development and Work Initiative Funds for research support.
- I want to thank UMF's Aquatic Research Interns Tyler Case, Hunter Corson, Leon Leary, Brian Scholten and Matt Bilodeau for their work on all aspects of this study.
- I wish to thank the Lakes Environmental Association, in particular Colin Holme and Amanda Pratt, for the use of their hobo profile string data
- I want to thank all who assisted this study by deploying and retrieving these data loggers over these past nine years.