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ART CONSERVATION, PRESERVATION AND COLLECTION MANAGEMENT

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Checking the Calibration of Dataloggers with Saturated Salt Solutions

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Overview

RH sensors can drift over time and have a limited lifespan, thus it is important to regularly check their accuracy. Manufacturers and distributors charge significant fees for logger recalibration, so it pays to be able to check them yourself, before sending them in for servicing. Setting up calibration salt chambers is an easy and inexpensive method of assessing RH sensor accuracy over time, and checking new loggers to assure they are functioning properly before their first deployment.

Saturated salt chambers are reported to have limited accuracy, but if several loggers and/or multiple logger types are run together, it can be a useful and reliable tool.

Conducting a three point calibration check ensures that sensors are accurate over their entire range. Different salts hold different RH levels when in a saturated solution. At AMNH, the commonly suggested combination of LiCl, MgCl, and NaCl is used and the chambers were constructed as described below (other salt combinations and configurations are possible).

- Lithium Chloride 11% RH
- Magnesium Chloride 33% RH
- Sodium Chloride 75% RH

Procedure



- The saturated salt solutions are placed in small well sealed plastic containers. The lids of the containers are fitted with a Gortex window allowing vapor exchange while preventing liquid spills and salt migration.



- The small container with the saturated salt solution is placed in a larger container that can accommodate several loggers.



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- The RH of salt solutions can be affected by temperature fluctuations, so it is best if the containers are placed in a location with constant temperature. A gasketed cabinet in a climate controlled store room is ideal.
- The loggers are set to take readings every 2 minutes, and are placed sequentially in each chamber for 2-3 days, moving from low to high RH.



- At the end of the monitoring period the data is downloaded. Loggers with readings outside the reported or acceptable accuracy range are retired, sent for recalibration, or submitted for refund, depending on their age and specifications.