

DOCKETED

Docket Number:	19-ERDD-01
Project Title:	Research Idea Exchange
TN #:	231317
Document Title:	Eagle Rock Analytics Comments - Staff Workshop on Hourly Temperature Data on Cal-Adapt
Description:	N/A
Filer:	System
Organization:	Eagle Rock Analytics/Owen Doherty
Submitter Role:	Public
Submission Date:	12/24/2019 3:22:00 PM
Docketed Date:	12/24/2019

Comment Received From: Owen Doherty
Submitted On: 12/24/2019
Docket Number: 19-ERDD-01

Staff Workshop on Hourly Temperature Data on Cal-Adapt

Additional submitted attachment is included below.



Eagle Rock Analytics

3669 57th Street

Sacramento, CA

owen@eaglerockanalytics.com or (631)-766-7406

December 24, 2019

Comments from Eagle Rock Analytics

Re: Staff-Workshop Hourly Temperature Data on Cal-Adapt

Docket #: 19-ERDD-01

Dear Dr. Schmidt-Poolman,

Thank you for the opportunity to present at the recent Staff Workshop entitled: "Hourly Temperature Data on Cal-Adapt." Below is an overview of our presentation, and some high-level suggestions for consideration as the California Energy Commission considers bringing hourly weather data from HadISD onto the Cal-Adapt platform.

We presented an overview of the history of weather observations in California, the changes to observing methods and dissemination of said observations, and how such changes lead to a need for robust and resilient quality assurance and quality control of observations. It is in ratepayers' best interest to have a stable, frequently updated reference database to be used as a standard and benchmark in California. This dataset, once distributed through Cal-Adapt, will free stakeholders from the need to employ costly consultants to generate good quality hourly weather data for them. Further, we suggest that the approach used to generate this should be open source, with methods employed to generate quality control being peer reviewed and the code open to the public. Such an approach would necessitate automation of quality assurance protocols, in the process removing human induced subjectivity and bias.

Five tests were designed to assess suitability of temperature records at each location in the record; (1) long-term stability (>30 years), (2) representative of diurnal cycle, (3) consistent observations taken over all years, (4) few missing observations (<20%) and (5) high-quality observations (<2%). During the workshop it was suggested that shorter records have practical uses (i.e. model verification) and should be made part of the record. To accommodate this suggestion, we propose extending the record to include additional stations and then appending a meta-data tag identifying a station as long-term and suitable for climatology, or, short-term record which should be excluded from climatology. Cal-Adapt could allow users to filter stations based on this tag, with a default to the long-term stable stations.

An open question to the stakeholder community is if homogenization of the record should occur. The record currently identifies locations where inhomogeneities occur (due to systematic long-term shifts of the record from changes in the observing environment or techniques) but does not correct for them. There are advantages and disadvantages to homogenizing the record, and it is presently unclear which approach would be most useful to energy sector stakeholders.

The hourly weather record contains many variables beyond temperature, the quality of which has not yet been fully assessed. We subjectively and non-quantitatively ranked the variables from highest quality to lowest quality. Two outstanding questions remain that would inform if or how these

Science. Statistics. Data.



Eagle Rock Analytics

3669 57th Street

Sacramento, CA

owen@eaglerockanalytics.com or (631)-766-7406

additional variables should be hosted on Cal-Adapt; (1) what level of quality is needed for operational use and (2) what variables are of interest to the community.

In recognition of recent CPUC rulemaking directing utilities to look at Cal-Adapt for weather and climate data, and the requirements for inclusion of high-quality data, we floated an error rate of 2% as representative of acceptable data. We look forward to reading comments from IOU's, POU's and Energy Sector stakeholders, to confirm or refute this 2% error rate as appropriate for their end uses.

Two potential improvements to the quality assurance approach were highlighted in the talk; (1) potential improvement in quality along the coastline by tweaking parameters to better reflect some typical California micro and meso-scale events (i.e. Diablo winds, and persistent marine layer intrusions) and (2) improving algorithms that merge individual records inappropriately. Such improvements would require additional effort and alteration to QA/QC protocols but might be necessary to make data operational in the Energy sector. In an ideal case, a spatially variant QA/QC protocol would be designed and implemented to improve records in the critical, highly populated coastal locations of south and central California. It is an open question as to weigh the benefits to getting hourly temperature data onto Cal-Adapt quickly versus an improved product that may take some time (and money) to produce and assess.

Temperature data can be presented in many transformed formulations, raw data, hourly anomalies, daily anomalies and typical meteorological year formulations were all presented for consideration. Further the idea of data levels as a service were presented, in which the temperature record could be presented at many different levels of quality. This would allow for a rather dynamic record, drawing from the same common reference source, that provided varying levels of quality each designed to meet a need.

Again, thank you for the opportunity to present at the "Hourly Temperature data on Cal-Adapt" Staff Workshop.

Respectfully Submitted,

Owen Doherty, PhD.
Principal Research Scientist
Eagle Rock Analytics
Sacramento, CA