Climate Analysis: Isotope Prediction

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1

Project Description

Overview

- The aim of this project is to use historic climate data on the U.S. west coast to predict atmospheric oxygen isotope composition
- Isotope Composition is a good predictor of rainfall
- Weather data is notoriously volatile, but any sort of reasonably accurate predictor would be very helpful for California
- Data provided to use by Professor Stott originates from various sites in California, Oregon, and Washington
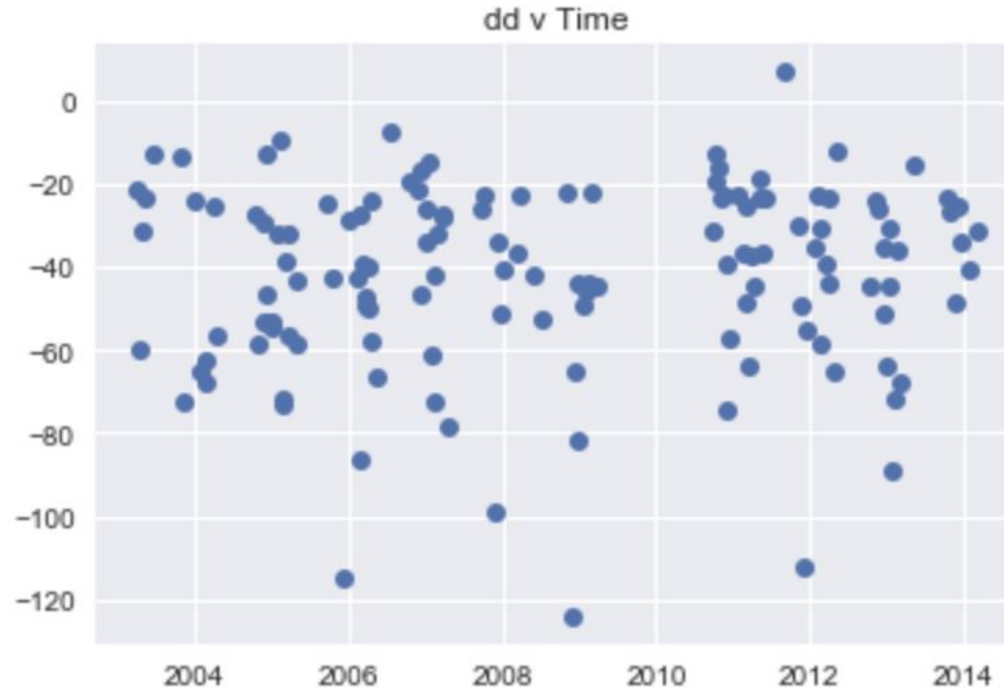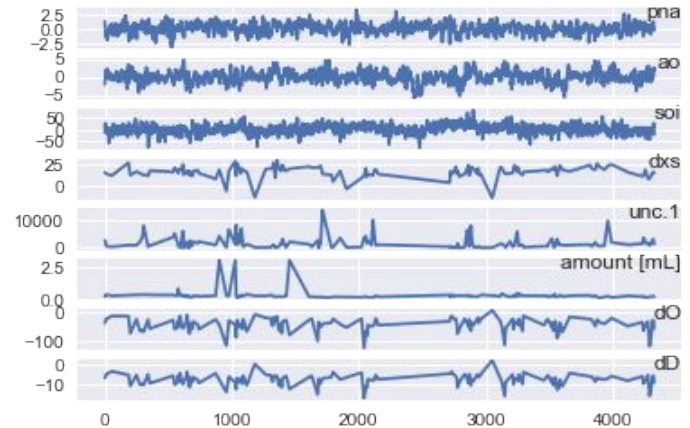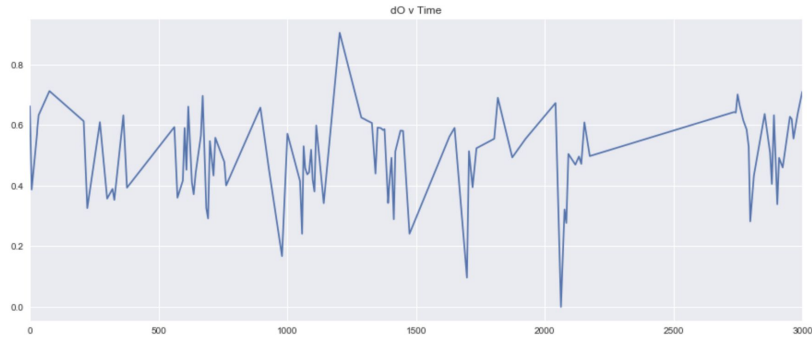
Locations
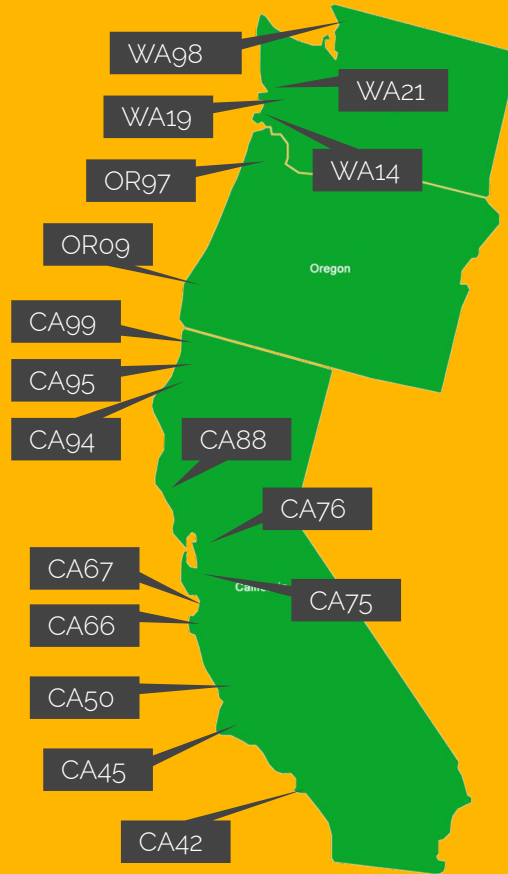
2

Building our Model
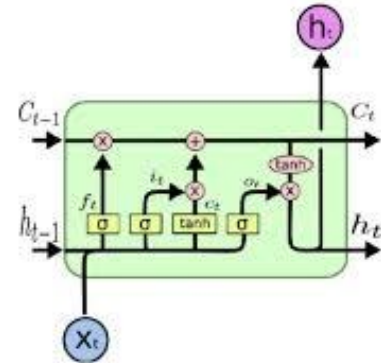
Unexpanded dataset
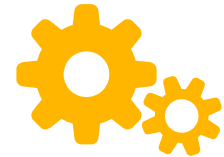

dd v Time

Expanded dataset
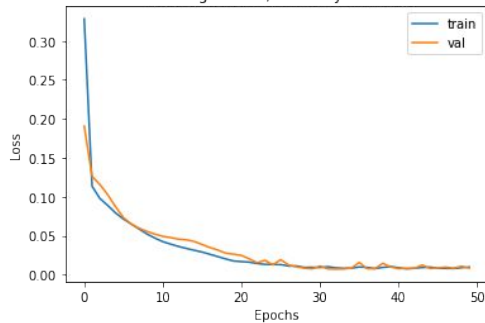
Training the Model

- Decided on a Long Short-Term Memory (LSTM)
- Predicted with differing gaps, input parameters (Day, Week, Month)
- Used one/two hidden layer structures, adding dropout to the second to prevent overfitting.
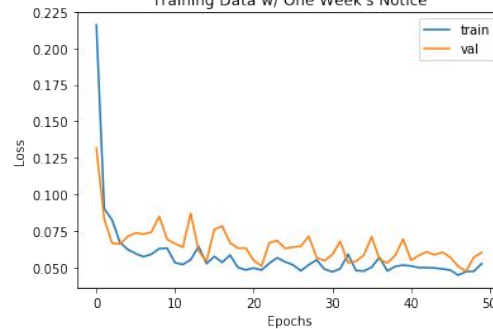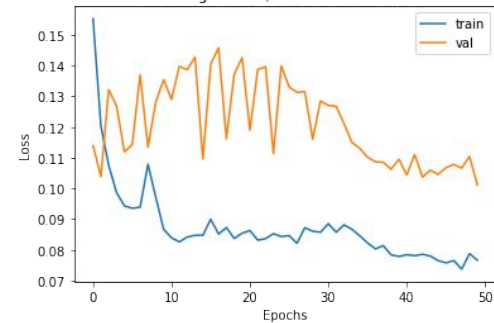
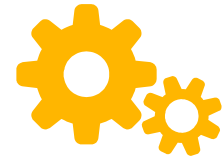# Results (One Layer)

Training Data w/ One Day's Notice

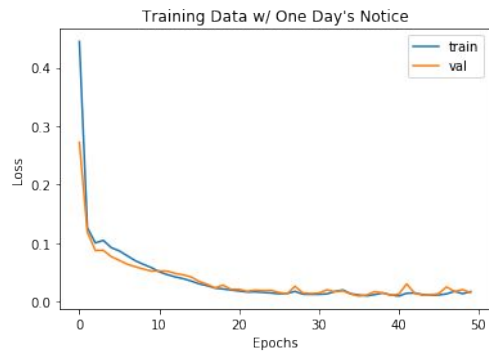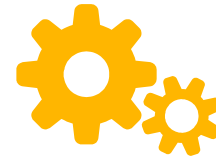Training Data w/ One Week's Notice

Training Data w/ One Month's Notice

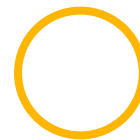# Results (Two Layers)

Significance

Prediction Ability

Long term predictions are hard.

Accuracy

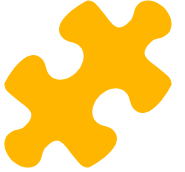How was the model affected by our data set expansion?

Model Structure

Deeper structure smoothed validation loss.

3

Next Steps

Project Expansion

Data Collection

Consult with researchers to decide which data is useful and easy to access

Weather vs. Climate

Decide the optimal advance notice for isotope composition

4

Questions?

Credits

Special thanks to all the people who made and released these awesome resources for free:

- Presentation template by SlidesCarnival
- Photographs by Unsplash