

## **Understanding El Nino Using Data in the Classroom**

<https://portal.nnvl.noaa.gov/arcgis/apps/MapSeries/index.html?appid=2f400061735f4b86903bb4b80b9a1a48>

### **Lesson Enhancement**

This data set would be used with a unit on weather and climate. Using real data provides an authentic context for students to engage with content. The practice of using authentic data is consistent with the STEM education framework of ensuring students engage in real life issues (Barakos, et. al., 2012). Further, using authentic data provides opportunities for student centered learning where they find trends and patterns within data sets, and between other learning activities, i.e, within surface temperature data students might observe relationships between location on the earth surface to surface temperature data. Also, when students work with data sets they are using technology to find and sort information which is a 21<sup>st</sup> century skill.

### **Using Data**

I really like using data in the classroom. First, data collected by student observation allows hands-on learning to occur within a subject area. Hands-on activities in the classroom provides some students, who otherwise might be disengaged due to various reasons, an opportunity to participate and have ownership in their learning. Another reason I like using data in the classroom is that it offers students authentic learning opportunities. Students appear more engaged in their learning when they know the academic material is being offered in a real-world context.

### **Visual Presentation/Interdisciplinary STEM**

My rationale for choosing this data set from NOAA is that it offers, within the data, formative assessment tools for students to use while they are working through the data sets. Also, the site provides opportunities for students to plan and investigate their own questions about the data from the site.

The NOAA data set on El Nino provides ample opportunities to work across STEM content areas. One way to work across STEM content areas would be to have students research the various types of sensors that might be needed to collect data about a phenomenon like El Nino. As an extension, students could use available sensors or build their own using micro-controllers, and then gather their own data based on a location near school or some other place-based learning opportunity. Again, authentic learning opportunities such as this provide students more ownership of academic content. For example, a small river runs directly by our high school campus. Students could use existing classroom resources or build their using micro controllers and collect temperature data on the stream over a certain amount of time. Then students could analyze the data look for patterns or trends to answer questions such as the following: when does the stream become warmest during the school year or even time of day?

Another way the data set works across STEM content areas is through mathematics. Students while working with data are exposed to all types of statistical methods. One opportunity might be to collaborate with math teachers while working this data set. Students could learn statistical methods and content while working with a real data set about the phenomena of El Nino, and at the same time be planning scientific investigations.