

# EARTH SIMULATION VARIABLES CHEAT SHEET

## Mode: AIR (Overlay)

*Wind - Wind speed*

*Temp - Temperature*

*RH - Relative humidity*

*WPD – Wind Power Density*

Amount of available wind energy at a given location

- Measured above Height: Sfc (surface) in kW/m<sup>2</sup>
- Important measurement in wind farm planning/evaluation

*3HPA - Three-Hour Precipitation Accumulation*

Amount of rain that has fallen in the last 3 hours

*CAPE – Convective Available Potential Energy*

Indication air buoyancy, measure of atmospheric instability

- Measured in the simulation in J/kg
- Typically reported in kJ/kg

*TPW – Total Precipitable Water*

Total amount of water in the air column if all the moisture fell as rain

*TCW – Total Cloud Water*

Total amount of water in the clouds in a column of air

*MSLP – Mean Sea Level Pressure*

Air pressure at roughly sea level; standard pressure is about 1013 hPa

- measured in hectopascals (hPa) by default
- 1 hPa = 1 mb (millibar)

*MI – Misery Index*

Perceived air temperature based on heat index and wind chill

## Mode: OCEAN (Overlay)

*Currents*

Estimated speed of ocean currents

*Waves*

Most energetic waves at a point

*SST – Sea Surface Temperature*

Temperature of the ocean surface

*SSTA – Sea Surface Temperature Anomaly*

Difference in temperature from 1981-2011 daily average

*HTSGW – Significant Wave Height*

Estimate of mean wave height that could be determined by a “trained observer”

## Getting to and Using the Earth Simulation

<https://earth.nullschool.net/>

1. Click on the word “earth” in the bottom left corner to open the options menu.
2. Click on “earth” again if you want to minimize the menu.

## Getting to and Using Desmos

[www.desmos.com/calculator](https://www.desmos.com/calculator)

1. Click on the + (plus button) in the top left corner of the left-side panel.
2. Select the “Table” option from the menu that drops down.
3. Name your variables and enter your data into the table.
4. To change colors and line styles for your graph, long left-click (hold down the left mouse button).

## Math and Science Standards

### Science

- MS-ESS2-5 - Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. (7<sup>th</sup> Grade: *Alabama Tornado*)
- MS-ESS2-6 - Develop and use a model to describe how unequal heating and rotation of the Earth causes patterns of atmospheric and oceanic circulation that determine regional climates. (7<sup>th</sup> Grade: *El Niño and La Niña*)

### Math

- 7.D.1.1 - Design simple experiments, collect data and calculate measures of central tendency (mean, median, and mode) and spread (range). Use these quantities to draw conclusions about the data collected and make predictions. (7<sup>th</sup> Grade: *Alabama Tornado*)
- PA.A.1.1 - Recognize that a function is a relationship between an independent variable and a dependent variable in which the value of the independent variable determines the value of the dependent variable. (Pre-Algebra: *El Niño and La Niña*)
- PA.A.1.2 - Use linear functions to represent and explain real-world and mathematical situations. (Pre-Algebra: *El Niño and La Niña*)