

Temperature and Solar Efficiency

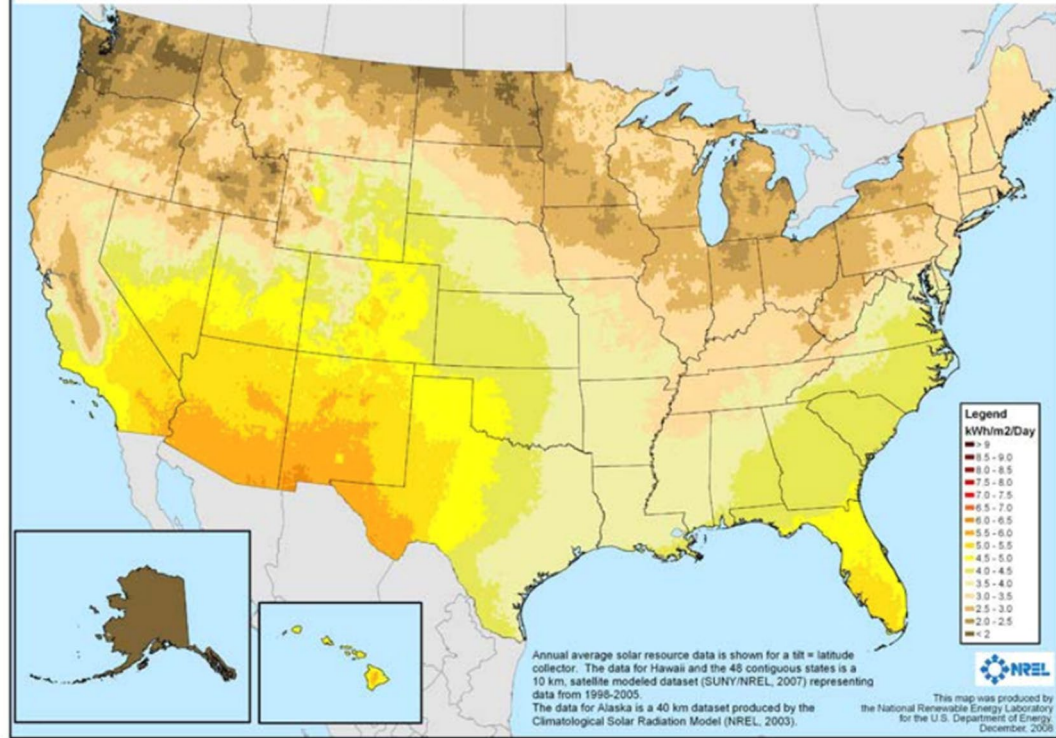




What do these pictures say about solar panel efficiency depending on temperature?

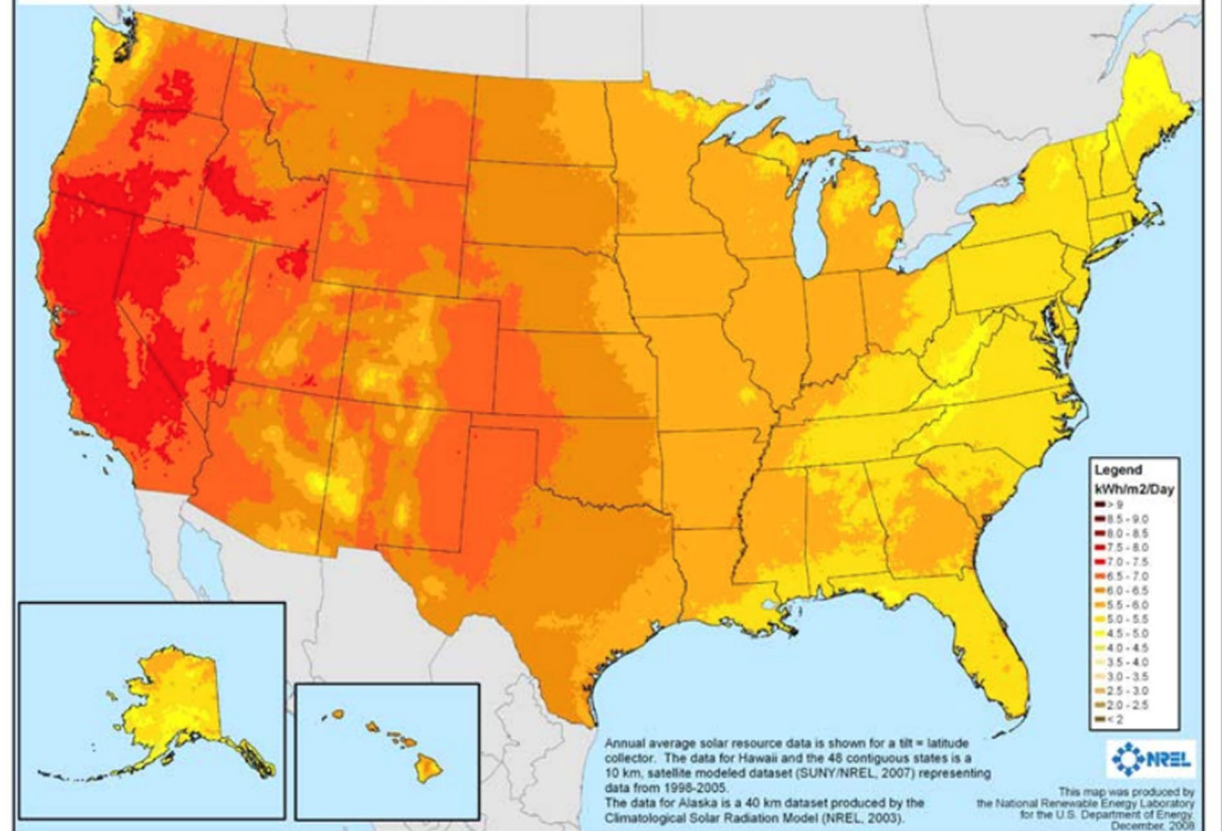
Photovoltaic Solar Resource:
Flat Plate Tilted South at Latitude

January



Photovoltaic Solar Resource:
Flat Plate Tilted South at Latitude

July



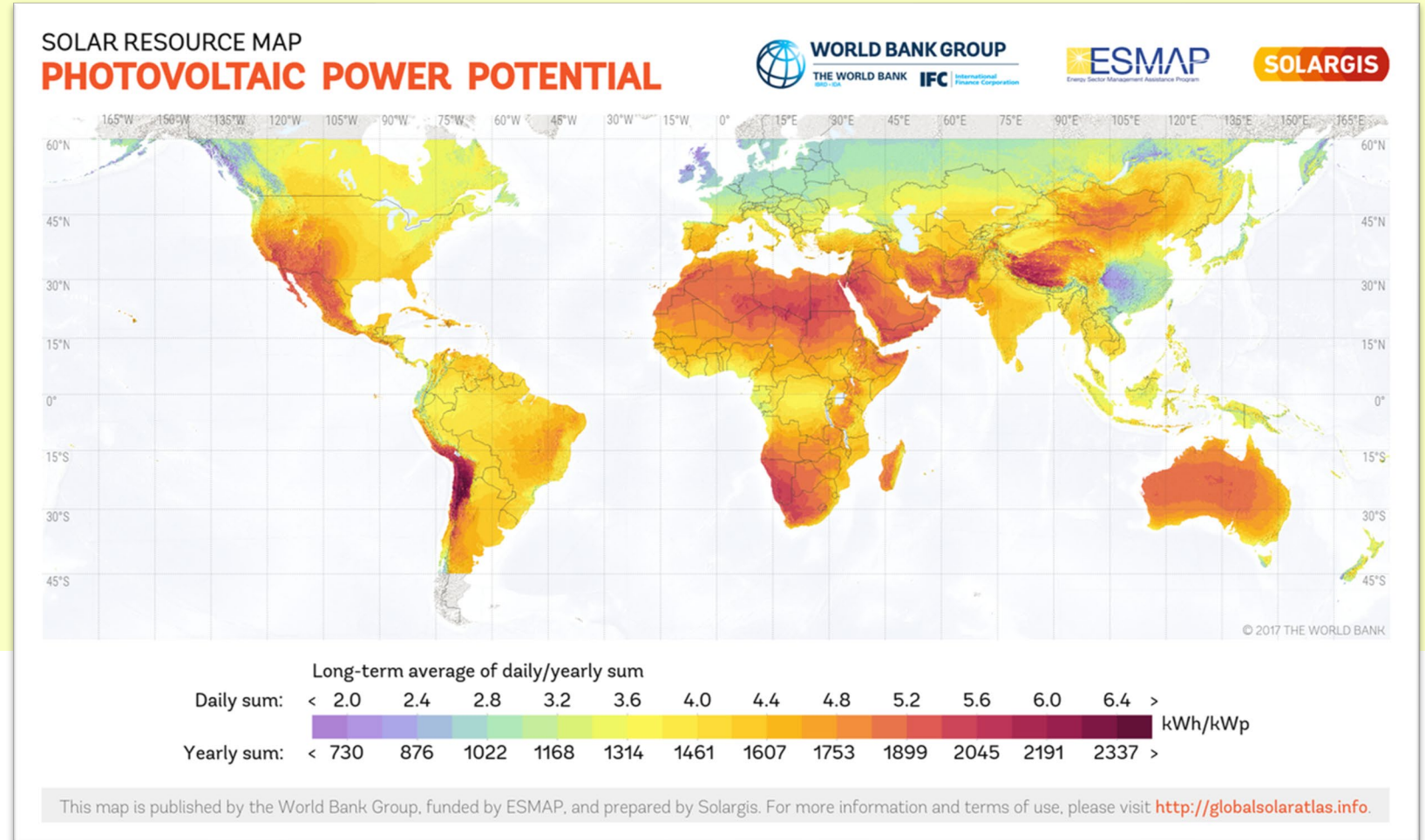


Investigation... How does temperature affect solar panel efficiency?

BIG QUESTIONS:

How does temperature affect...

1. Voltage?
2. Current
3. Power?





Investigation... How does temperature affect solar panel efficiency?

Materials needed:

- 12V mini solar panel
- Wires
- Multimeter
- Lamp
- Meterstick
- Laser thermometer
- Ziploc bag
- Stopwatch





Investigation... How does temperature affect solar panel efficiency?

Predictions?



Investigation... How does temperature affect solar panel efficiency?

- Complete the procedure with your group and record data. (~20 minutes)
- Using Excel, create the three graphs outlined on your lab sheet. (~7 minutes)
- Answer the graph interpretation questions at the bottom. (~3 minutes)



Results

- How is **voltage** affected by temperature?
- How is **current** affected by temperature?
- How is **power** affected by temperature?

- As Temperature $\boxed{\uparrow}$, Voltage $\boxed{\downarrow}$
- As Temperature $\boxed{\uparrow}$, Current $\boxed{\uparrow}$
- As Temperature $\boxed{\uparrow}$, Power $\boxed{\downarrow}$
- This is due to the nature of **semiconductors**.

With your neighbor, discuss which location would be most ideal for solar energy



Antarctica



The Caribbean

With your neighbor, discuss which location would be most ideal for solar energy



Arizona



Colorado