

# Welcome to

MICHIGAN  
ALTERNATIVE & RENEWABLE ENERGY  
CENTER (MAREC)

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# So you've heard MI doesn't have good solar!

## Grand Rapids, MI

WBAN NO. 94860

### Solar Radiation

Tilt (°)		Year
0	Average	3.8
	Min/Max	3.6/4.0
Latitude -15	Average	4.3
	Min/Max	4.0/4.5
Latitude	Average	4.2
	Min/Max	4.0/4.5
Latitude +15	Average	4.0
	Min/Max	3.8/4.3
90	Average	2.9
	Min/Max	2.7/3.1

## Miami, FL

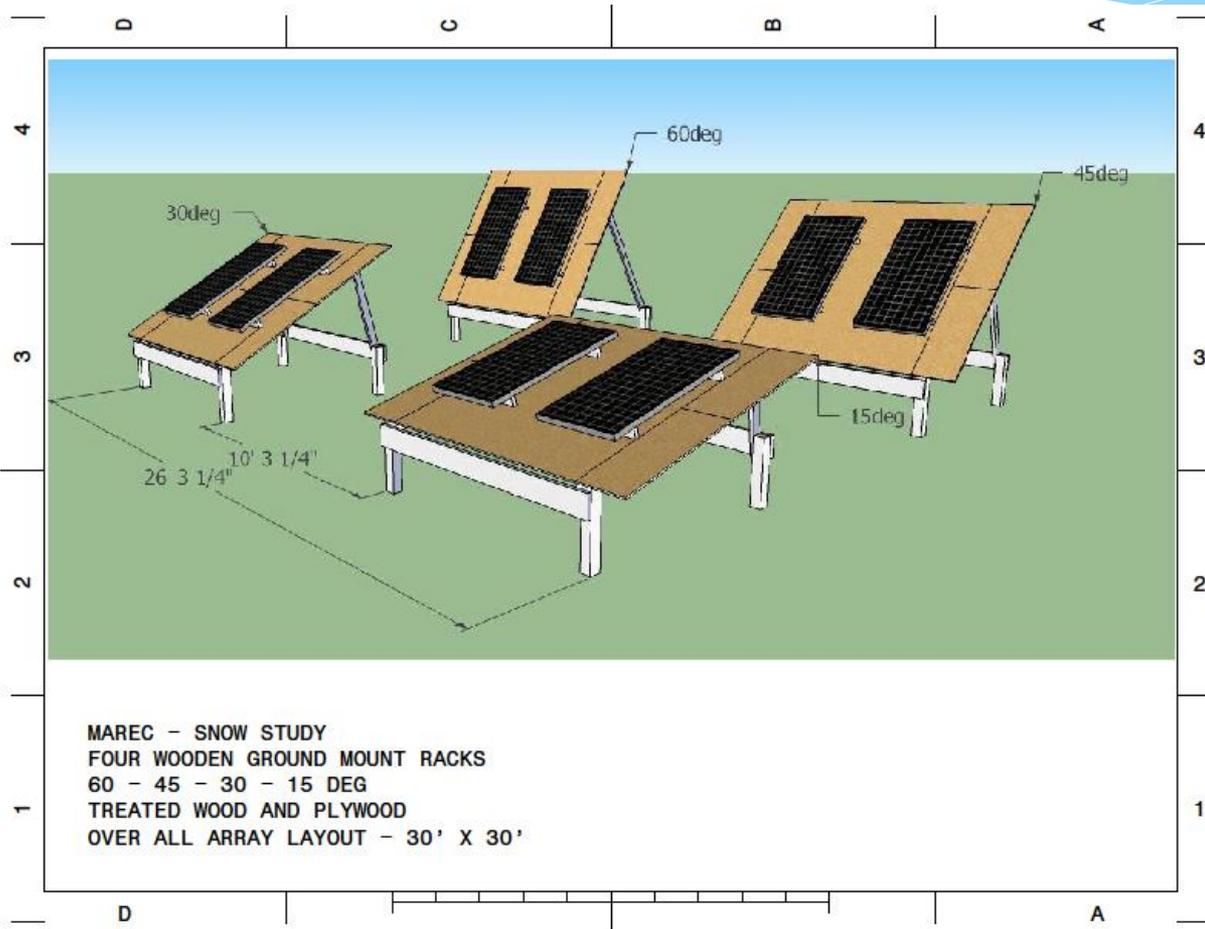
WBAN NO. 12839

Year
4.8
4.5/5.1
5.1
4.8/5.4
5.2
4.8/5.5
5.1
4.7/5.4
3.0
2.7/3.1

- \* 0-Degrees -MI gets 79% of Miami FL's solar Radiation (Panels Laying flat)
- \* 90 Degrees -MI gets 97% of Miami FL's solar Radiation (Panels up right)
- \* Set at Latitude - MI gets 81% of Miami FL's solar Radiation
- \* Set at Latitude -15 degrees - MI gets 84% of Miami FL's solar Radiation

Solar Radiation for Flat-Plate Collectors Facing South at a Fixed Tilt (kWh/m<sup>2</sup>/day), Uncertainty ±9%

# Key Project Goals



Quantify Michigan's  
Micro Climates

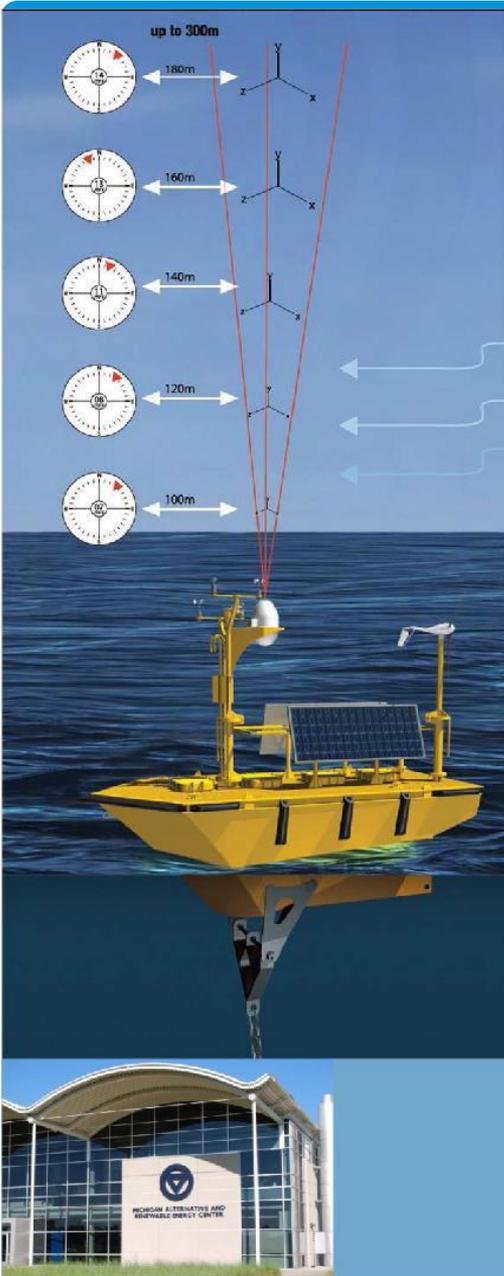
Assess the benefits of  
renewable energy  
technology on  
working class families

Work with the Great  
Lakes Renewable  
Energy Association to  
build off the 3.5  
million dollar grant  
money, to help local  
businesses.

# Wind

## Key Project Goals

- ❖ To collect and analyze wind data essential to the consideration of future wind industry development on the Great Lakes
- ❖ To develop real-time / hub-height offshore wind data called for by prior Great Lakes wind assessment studies (2004 & 2009)
- ❖ To validate the use of laser pulse (LIDAR) technology on a mobile platform as a viable wind assessment technology
- ❖ Goal to advance the knowledge of bird and bat ecology over the Great Lakes



# Summary

Michigan has a good start on renewable energy usage and the businesses to support these technologies are here.

We need to keep moving forward

