

# Beneficial Insect Study on the Oil-Seed Energy Crop Canola & Living Sustainably - Steger Style



Melanie Waite-Altringer, Biology Faculty

# Beneficial Insect Project Partners

- EverCat Fuels/SarTec
- **USDA-ARS** (agricultural research service)  
Morris, MN
- Winfield
- Federated Co-ops
- **Bayer CropScience**



# Cambridge Campus of Anoka-Ramsey Community College




# Field Prep at Demonstration plot

► May 5<sup>th</sup> Disc - Harrow by Gerald Gelle



# Field Prep at Demonstration Plot

- ▶ **May 6<sup>th</sup> Fertilized & Limed**
- ▶ (33-8-0-8 @ 300lbs/A).
- ▶ The unfertilized soil consisted mainly of loamy sand:
  - ▶ pH of 5.7-6.8
  - ▶ organic matter at 0.6-1.1%
  - ▶ phosphorus at 43-84ppm
  - ▶ potassium at 45-194ppm
  - ▶ extremely low nitrogen levels.
- ▶ The area had heavy rain (2+" the days just following planting.



**FEDERATED CO-OPS**  
Inc.  
**ISANTI AG CENTER**  
FERTILIZER/CHEMICALS/SEED • 763-444-5561

CUSTOMER Anoka Ramsey College

DELIVERY METHOD \_\_\_\_\_

TOTAL LBS. NEEDED 3 ton

NUMBER OF ACRES 20 Acres

LBS. PER ACRE 300#

TYPE OF FERTILIZER canola fert

## FERTILIZER MIXING TICKET

DATE 4-23-14

TIME \_\_\_\_\_

NOTES:

PLANT FOOD N \_\_\_\_\_ P<sub>2</sub>O<sub>5</sub> \_\_\_\_\_ K<sub>2</sub>O \_\_\_\_\_ S \_\_\_\_\_ PER ACRE GRADE

POUNDS PER TON OR ACRE	MATERIALS TO BE USED	TOTAL POUNDS REQUIRED	POUNDS PER BATCH	ACCUMULATED SCALE
	0-0-60 POTASH			
<u>150</u>	46-0-0 UREA <u>175</u>	<u>3000</u>		<u>3000</u>
<u>50</u>	18-46-0 DAP <u>650</u>	<u>1000</u>		<u>4000</u>
	PEL-LIME			
<u>100</u>	AM-SULFATE 21-0-0-24 <u>40</u>	<u>2000</u>		<u>6000</u>
	SUL-PO-MAG 0-0-22-22-11			
	BORON			
	spreader rent	<u>\$30</u>		
<b>TOTAL</b>				<u>\$1629.90</u>

\$15.25

# Planting Canola at Demonstration plot Brillion Seeder

May 7<sup>th</sup> - The field was planted with Canola InVigor hybrids L130 (early maturity) & L160S, donated by Bayer CropScience, using a Brillion seeder at ~8lbs/A. Recommended is 5lbs/A.

**InVigor**<sup>®</sup>

Click [HERE for YouTube Video](#) of prep work & canola being planted.



Bayer CropScience



# Canola Seedlings Emerging May 21<sup>st</sup>



# Canola growth June 3<sup>rd</sup>-4<sup>th</sup>

- ▶ No herbicides have been applied at this point. The large ruts seen through the canola fields are due to placing gopher bait, in moist soil, throughout the plot.





# E3: Energy Education for Educators Conference

- ▶ **June 9<sup>th</sup>** Soil and its effects upon canola growth study conducted by High School faculty around the state of Minnesota during the E3 conference at the ARCC demonstration plot.



# E3: Energy Education for Educators Conference 2014

**June 8-12** College Collaborators: St. Cloud Technical and Community College, Anoka-Ramsey Community College, Century College, MN West

Topics & Tours showcased 2014: Solar Array, Wind, Energy Crop, Waste to Energy, Biofuel/Ethanol, Nuclear Power, DAQ device lab

**2015:** 2 day conferences over a 2 week period in 6 different areas around State including: ARCC, SCTCC, Fond du Lac, Itasca, Century, MN West, Riverland Topics same as last year, except no DAQ and adding Anaerobic Digester at Haubenschild farm & Powerline workers



# Beneficial insect study on canola began June 23<sup>rd</sup>

•Spring Canola Field is beginning to bloom. Beneficial insect study began at the demonstration plot's early maturity canola field. The site had been sprayed with Liberty herbicide on June 10th, 2014.



# Beneficial insect study on canola began June 23<sup>rd</sup>

- ▶ USDA protocol for direct insect counts:
  - ▶ Estimate % flower cover
  - ▶ Photograph for accurate calculation of % flower using ImageJ program
  - ▶ 2x a week between 11-2pm
  - ▶ Rainless day above 50°F
  - ▶ Cloud cover estimation
  - ▶ Wind below 10mph
  - ▶ 2min 60' walk lines
  - ▶ 1 person recording and 1-2 people counting
  - ▶ Insect counts (Bumblebee, Honeybee, Fly, Small bee, Butterfly, Beetle, Other)



# Flower % calculations



# Beneficial insect study on canola began June 23<sup>rd</sup>



# Beneficial insect study on canola June 30<sup>th</sup>



# Beneficial insect study on canola July 9<sup>th</sup>

Early emergent canola is now beginning to lose its flowers with pods now forming. The standard growth length spring canola is just now in full bloom. The canola ranges in height from 2' to 5'. The majority of the canola field is ~4'.





# Study data collection July 12<sup>th</sup>-19<sup>th</sup>

The canola flower numbers are reducing and the pods are filling out. Waite-Altringer's online environmental science lab students conducted a soil study within the canola field. The soil tests included levels of nitrogen, phosphorus, potassium, pH, percolation rates, canola plant counts/density, and topographic data.



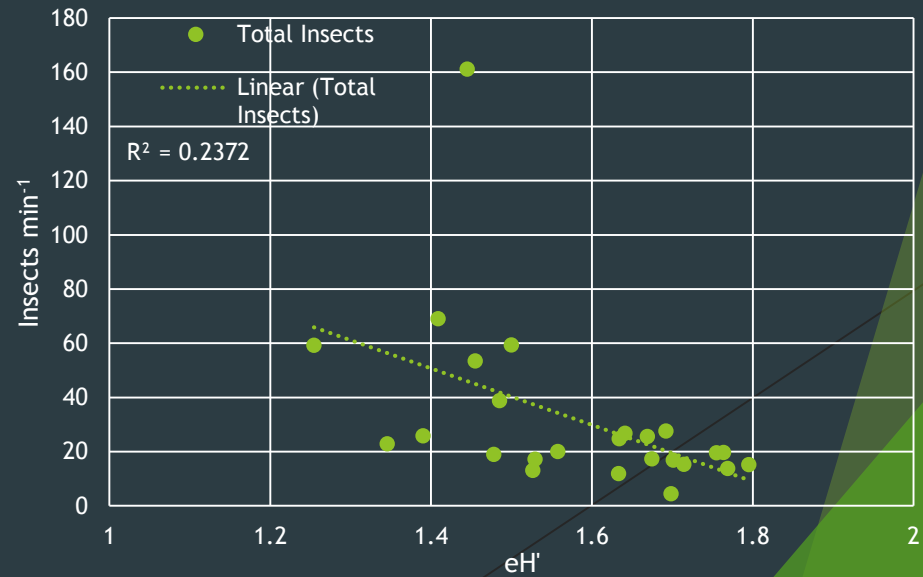
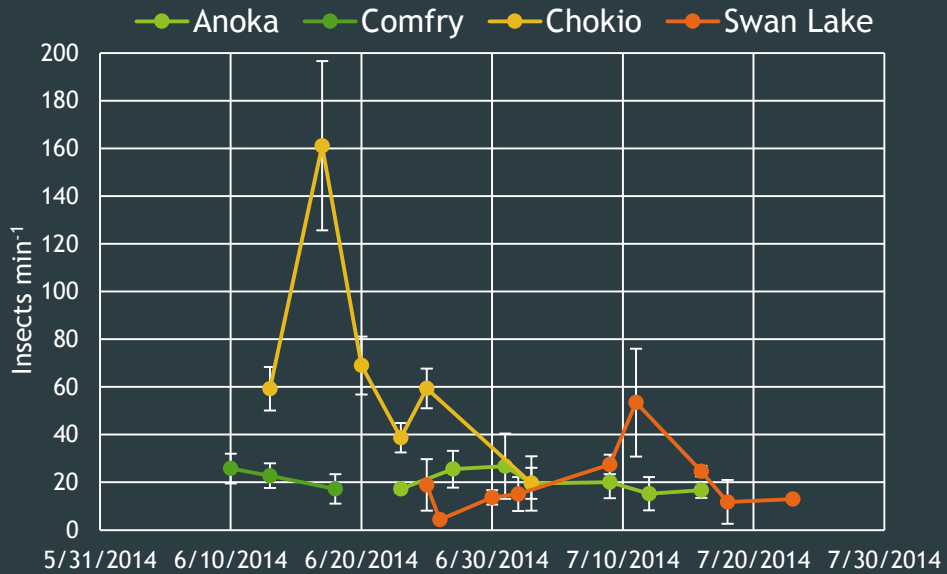
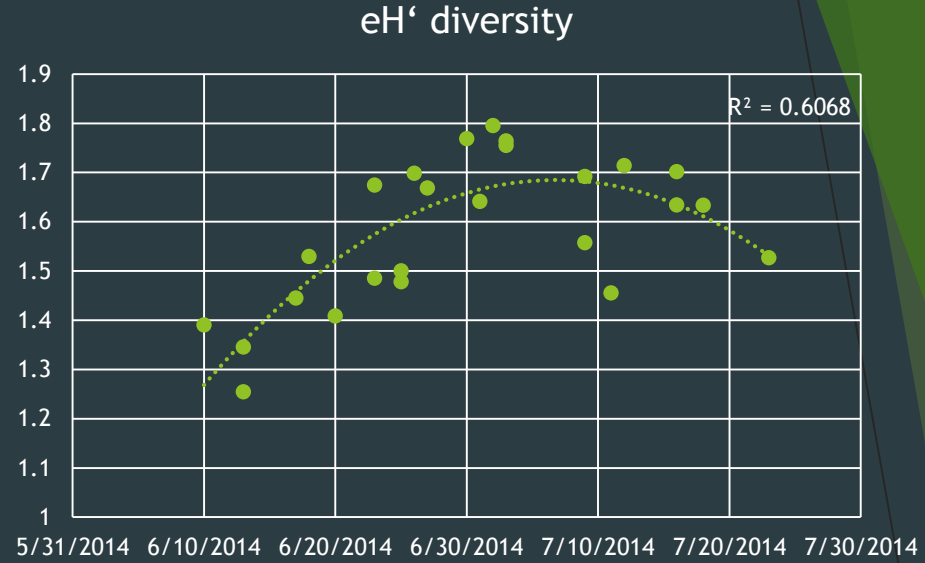
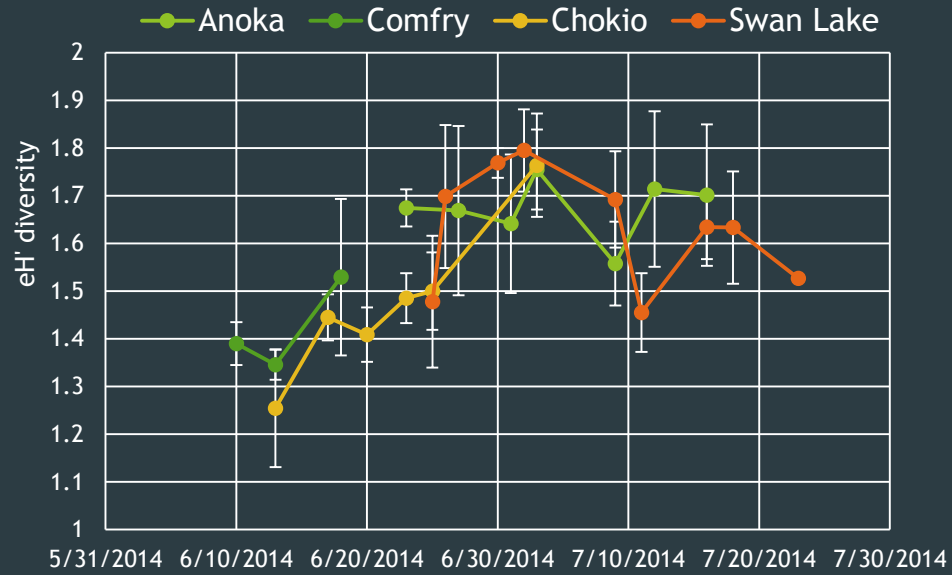
# Canola growth with pods and flowers July 12<sup>th</sup>



# Beneficial Insect study field raw data- visual inspection

Date	Time	Observers	Obs No	Sky	Wind	Temp	Exp	Plot	Crop	% Flower Cover	Honey Bee	Bumblebee	Small bee	Flies	Butterflies	Beetles	Other
6/23/2014	10:21:08 AM	Brian/Maxwell	2	Mostly Cloudy	5	70.0		101	S. Canola	<1	0	0	4	7	0	2	2
6/23/2014	11:38:33 AM	Brian/Maxwell	2	Partly Cloudy	0	73.0		102	S. Canola	<1	0	0	11	4	0	2	2
6/23/2014	11:51:17 AM	Brian/Maxwell	2	Partly Cloudy	0	73.0		103	S. Canola	<1	0	0	6	3	0	1	7
6/23/2014	12:14:32 PM	Brian/Maxwell	2	Mostly Cloudy	0	74.0		104	S. Canola	<1	0	0	9	4	0	4	1
6/27/2014	11:08:11 AM	Amy/Ashley	2	Overcast	10	73.0		101	S. Canola	1	0	1	8	8	0	7	4
6/27/2014	11:18:00 AM	Amy/Ashley	2	Overcast	10	73.0		102	S. Canola	1	0	0	6	1	0	7	0
6/27/2014	11:28:00 AM	Amy/Ashley	2	Overcast	10	73.0		103	S. Canola	2	0	0	17	3	2	3	5
6/27/2014	11:38:00 AM	Amy/Ashley	2	Overcast	10	73.0		104	S. Canola	5	0	0	11	3	0	1	15
7/1/2014	11:07	Amy/Ashley	2	Overcast	15	68.0		101	S. Canola	5	0	0	1	7	0	28	3
7/1/2014	11:18	Amy/Ashley	2	Overcast	8	70.0		102	S. Canola	<1	1	0	5	1	0	0	2
7/1/2014	11:28	Amy/Ashley	2	Overcast	10	70.0		103	S. Canola	10	0	0	4	6	0	4	9
7/1/2014	11:39	Amy/Ashley	2	Overcast	9	70.0		104	S. Canola	10	0	0	15	8	0	2	11
7/3/2014	11:48	Maxwell	1	Mostly cloudy	2	70.0		101	S. Canola	2	5	0	1	1	0	5	0
7/3/2014	11:55	Maxwell	1	Mostly cloudy	2	70.0		102	S. Canola	1	1	0	2	2	0	0	4
7/3/2014	12:01	Maxwell	1	Mostly cloudy	6	73.0		103	S. Canola	35	6	0	5	6	0	0	6
7/3/2014	12:06	Maxwell	1	Mostly cloudy	6	73.0		104	S. Canola	35	8	0	8	11	0	0	7
7/9/2014	10:55	Maxwell/Ed	2	clear	4	70		101	S. Canola	<1	1	0	0	0	0	7	3
7/9/2014	11:18	Maxwell/Ed	2	clear	6	72		102	S. Canola	4	8	1	0	8	0	0	3
7/9/2014	11:06	Maxwell/Ed	2	clear	4	70		103	S. Canola	35	17	0	3	4	0	0	3
7/9/2014	11:30	Maxwell/Ed	2	clear	6	72		104	S. Canola	6	12	0	1	1	0	0	8
7/12/2014	11:25	Glenn	1	overcast	0	73		102	S. Canola	<1	0	1	2	0	0	0	4
7/12/2014	11:31	Glenn	1	overcast	1	73		103	S. Canola	5	2	6	0	5	0	0	11
7/12/2014	11:04	Glenn	1	overcast	6	73		105	S. Canola	15	2	1	3	0	1	0	9
7/12/2014	11:14	Glenn	1	overcast	2	73		106	S. Canola	5	1	3	5	3	0	0	2
7/16/2014	12:46	Ed	1	Partly Cloudy	5	73		102	S. Canola	<1	5	2	0	2	0	0	4
7/16/2014	12:55	Ed	1	Partly Cloudy	8	73		103	S. Canola	<1	7	2	0	3	0	2	2
7/16/2014	1:05	Ed	1	Partly Cloudy	8	73		105	S. Canola	<1	10	4	0	2	0	0	1
7/16/2014	1:11	Ed	1	Partly Cloudy	3	73		106	S. Canola	<1	13	1	0	3	0	0	4

# Beneficial insect data- canola



# Mature canola August 16<sup>th</sup>



# Canola swathing August 16<sup>th</sup>

•All of the Bayer CropScience canola, InVigor L130 & InVigor L160S, was swathed and put into windrows for drying by Jeff DeYoung using a 2012 MacDon M155, with a 20ft draper head. Click [HERE for YouTube Video](#) of the canola being swathed.



# Canola combined and shipped September 12<sup>th</sup>

•The Bayer CropScience canola, InVigor L130 & InVigor L160S, was combined by Jeff DeYoung using a John Deere 9560, with a 912 pick up head. The canola was purchased by Northstar Agri Industries and was hauled away by their "on farm pick-up service". The canola field yielded a clean weight of 26,423lbs (528.5 bushels). Sold to NorthStar Agri in Hallock, MN (\$3472). Click [HERE for a YouTube Video](#) of the canola being combined.





# Bid Sheet

Buying Canola Now! Contact our Grain Originators, Zack Schaefer or Danielle Storm.

Check us out at <a href="http://www.northstaragri.com">www.northstaragri.com</a> or contact us at 1-855-5CANOLA!			Date: 9/12/2014					
			Dump Hours: Monday thru Friday - 7 AM to 7 PM					
Delivery Month		Basis	Futures	Cash Price CDN \$ / MT	US \$ / MT Delivered	US \$ / CWT Delivered	US \$ / Bu Delivered	CDN \$ / Bu Delivered
14-Aug-Sept	x	-10	\$ 413.10	\$ 403.10	\$ 364.04	\$ 16.51	\$ 8.26	\$ 9.14
Prem Priced - Sep	x	-10	\$ 413.10	\$ 423.26	\$ 382.24	\$ 17.34	\$ 8.67	\$ 9.60
14-Oct	x	-7	\$ 413.10	\$ 406.10	\$ 365.98	\$ 16.60	\$ 8.30	\$ 9.21
14-Nov	x	-5	\$ 413.10	\$ 408.10	\$ 367.78	\$ 16.68	\$ 8.34	\$ 9.26
14-Dec	F	0	\$ 417.70	\$ 417.70	\$ 376.43	\$ 17.07	\$ 8.54	\$ 9.47
15-Jan	F	0	\$ 417.70	\$ 417.70	\$ 380.73	\$ 17.27	\$ 8.63	\$ 9.47
15-Feb	H	-5	\$ 422.90	\$ 417.90	\$ 380.92	\$ 17.28	\$ 8.64	\$ 9.48
15-Mar	H	-5	\$ 422.90	\$ 417.90	\$ 380.92	\$ 17.28	\$ 8.64	\$ 9.48

All bids are delivered Hallock. Contact us today at US - 1-855-5CANOLA - Canada - 1-844-222-6652

All bids subject to hedge and can change without notice. All contracts will be in MT. Payable in USD.

**Call us today with questions about 2014 / 15 Premium Priced Canola!**

Premium Priced grain is payable on first 1,250 lbs / contracted acre.

- Canola was ~\$420/ton
- Trucking was ~\$28/ton
- Net ~\$390-\$400
- 25 acres fit in one truck.

- Current recommendation is to swath when 60% of the pods of the main stem have seeds that are changing color.
- If past 60%, you run the risk of shatter, this risk can be minimized by swathing when there is dew on the plant.

[WEBSITE](#)



# 2015 Beneficial Insect Study plans USDA & Bayer CropScience

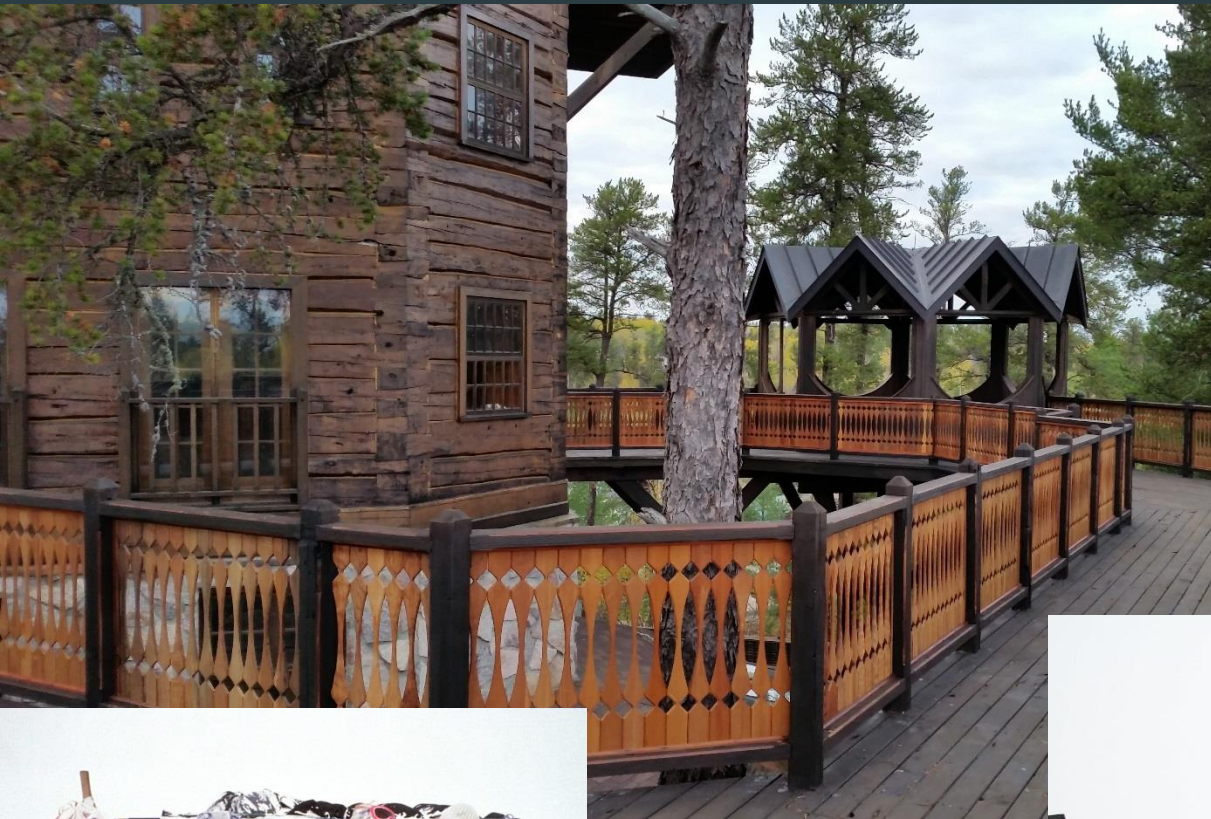


# 2015 Beneficial Insect Study plans

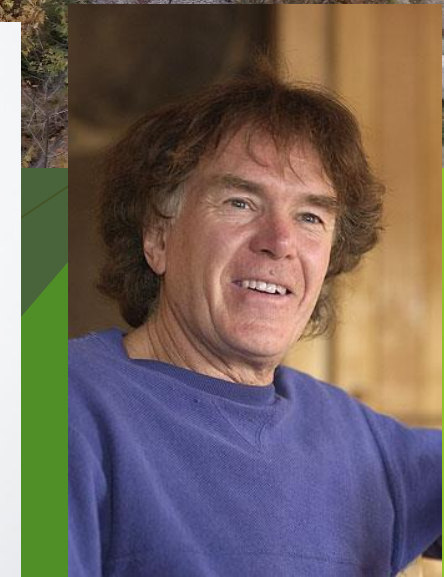
- Partner with Bayer CropScience & USDA-ARS in Morris
- FeedABee <http://feedabee.com/>
- Support Undergraduate Research opportunities - \$500 stipends to 4 students & present work in NC headquarters
- Environmental Science lab students 50+ will be gathering additional data at sites for project



# 2015 Explorer Will Steger -Solar Partnership & Wilderness Education Center



International  
Trans-Antarctic  
Expedition  
1989-90



# 2015 Explorer Will Steger-ARCC solar partnership

- ▶ Ten K Solar donated a large solar panel for off grid use at Will Steger's Homestead
- ▶ Anoka-Ramsey will be installing a 458 KW solar array through an Xcel energy grant
- ▶ Compare latitude, angles, structure type, and other variables at each location

▶ [CLICK  
HERE- AZU](#)



# 2015 Explorer Will Steger-ARCC solar partnership

▶ [CLICK HERE- AZU](#)



# 2015 Explorer Will Steger - Sustainable Energy Living

- ▶ Youtube video of the ice harvest: [click here](#)
- ▶ Waite-Altringer's Ice Harvest Photos: [Click here](http://webs.anokaramsey.edu/waite/environmental/Ice_ball_2015_Steger.htm)  
[http://webs.anokaramsey.edu/waite/environmental/Ice\\_ball\\_2015\\_Steger.htm](http://webs.anokaramsey.edu/waite/environmental/Ice_ball_2015_Steger.htm)



# 2015 Explorer Will Steger - Sustainable Energy Living



THANKS!!!!

QUESTIONS?