

# Precipitating Change – Alaska Mainland Science Notebook

**Table of Language Groups**

Language Family	Language Name(s)
Ainu	Unangam, Unangan, Unangan, Unangan Tunai, Abut
	Alutiq, Sugpiaq
	Central Yup'ik, Cup'ik, Cup'ig
	Naukan Yupik
Inuit-Yupik	Siberian Yupik
	St. Lawrence Island Yupik
	Sirenik
Nahiclian	Tsimshian
	Haida
Tlingit	Tlingit, Lingit
	Eyak
Athabaskan	Ahtna
	Dena'ina, Tanana
	Deg Xinag, Deg H't'an
	Holikachuk, Inoeko
	Koyukon, Dena'ik'e
	Upper Kuskokwim, Kolchan
	(Lower) Tanana
	Tanacross
	Upper Tanana, Nabesna
	Han
	Gwich'in, Kutchin, Tukudhi
	Other Athabaskan



### Indigenous Peoples and Languages of Alaska

This map shows the indigenous language regions of Alaska. Related languages of neighboring Canada and Russia are also shown. The language boundaries represent traditional territories of approximately 1900. Though some shifts in language boundaries have occurred since that time, boundaries are defined based on the similarity of sound systems and the ability of speakers from different regions to understand each other.

The colors of the individual languages reflect their classification into language families, each of which share a common ancestral language. Sixteen of the twenty indigenous Alaska languages on this map belong to either the Inuit-Yupik, Aleut or the Athabaskan-Eskimo-Tlingit families. Somehan is a member of the small Tananaic family, while Haida is an isolate, not demonstrably related to any other language in the world.

The language names appearing on this map are the English names generally accepted by most speakers today. Alternate names are listed in the legend. A selection of modern and historic indigenous villages are labeled with both indigenous and English names, as are major rivers, lakes, and islands. A comprehensive inventory of indigenous place names, including village sites and geographic features, would number in the tens of thousands.

As of 2010 few indigenous languages in Alaska are still spoken by children, but significant revitalization programs exist for some languages.

Although based on linguistic definitions, geographic, and social, and ethnic, an Alutiq, Sugpiaq, Inuit and 1960 Native People and Languages of Alaska map, this map differs in several ways from that map. This map does not include indigenous populations or speaker numbers. Language labels in each village or size of village, and dialect boundaries. Finally, several language names have been revised to reflect current usage.

More information about Alaska languages and language maps can be found at [www.uaf.edu/aila](http://www.uaf.edu/aila).

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Map design and layout by Dennis A. Ruppel  
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# Introduction

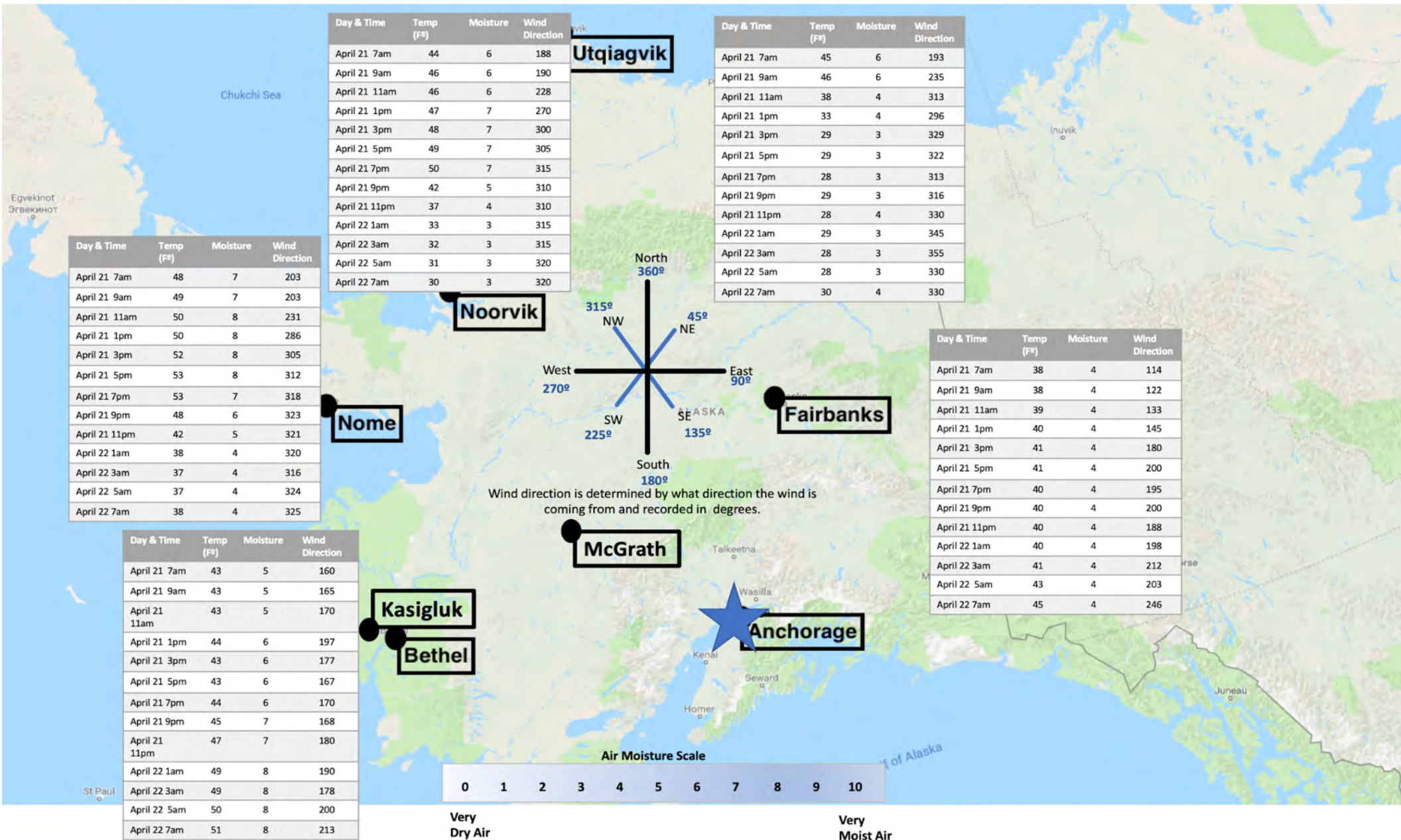
Your challenge is to determine if the Native Youth Olympics (NYO Games) in Anchorage will be able to take place as planned or if it should be postponed or canceled due to weather causing problems for participants traveling to Anchorage from across Alaska. This Science Notebook will provide you with all of the data and resources your Research Team will need to make your prediction. Feel free to write and draw in these notebooks to capture your thoughts, questions, and reasoning and to answer activity questions. Your teacher will be collecting the Science Notebook after the unit is complete and will consider the answers and work completed in this notebook in your final grade.

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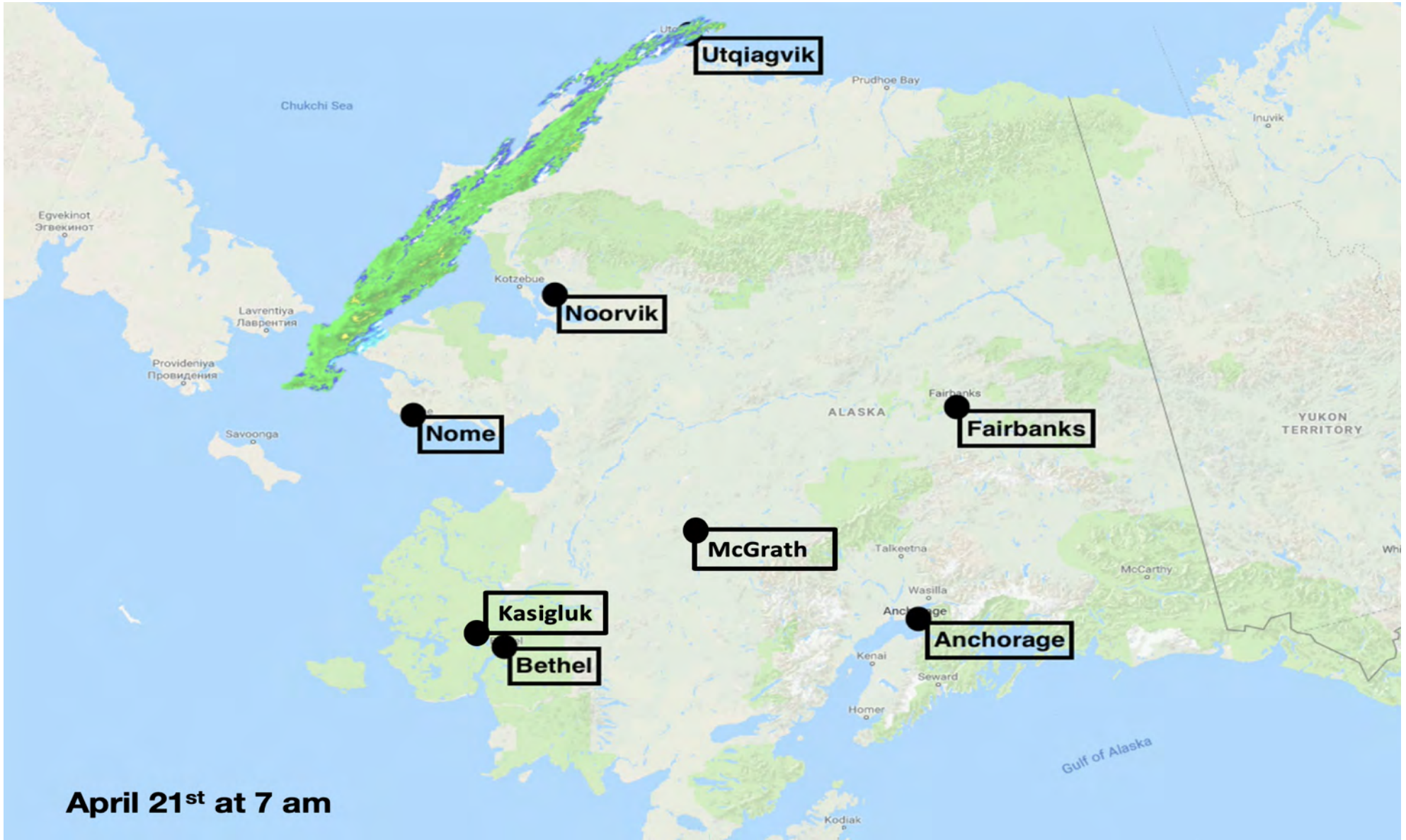
# Lesson 1



# Lesson 1, Activity 2: Weather Station Data



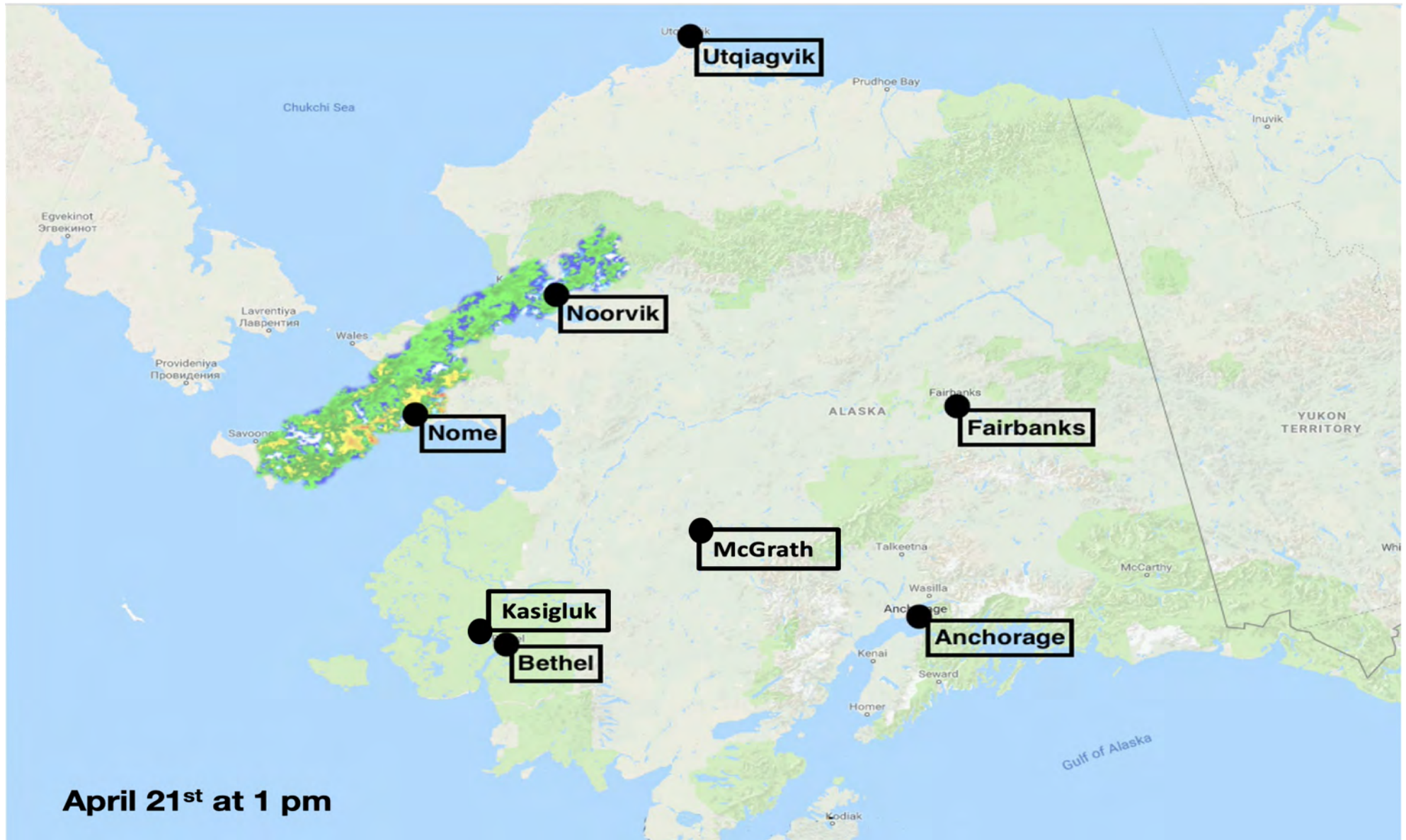
**Lesson 1, Activity 2: Radar Map: April 21, 7 am - Alaska Mainland**



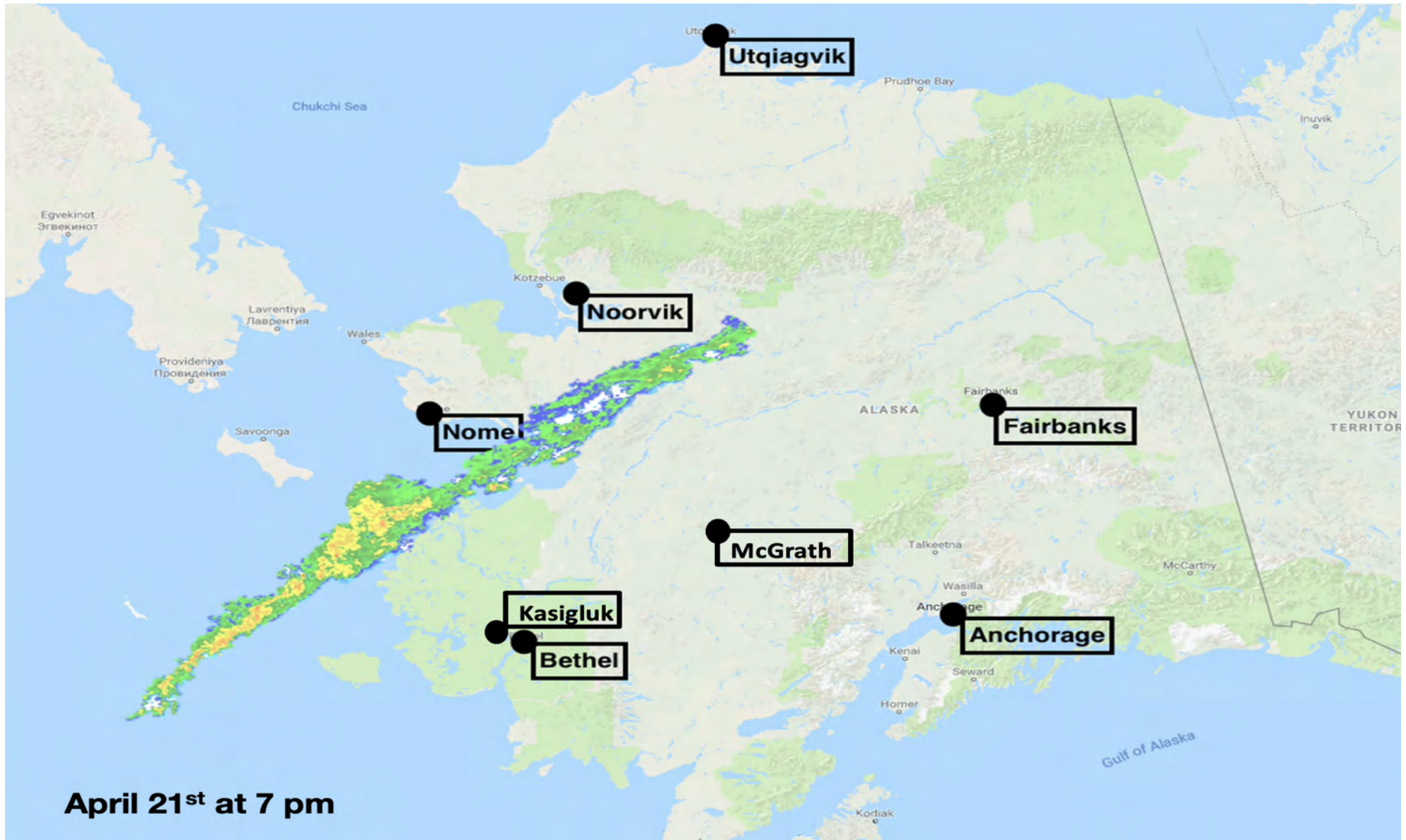
**April 21<sup>st</sup> at 7 am**



## Lesson 1, Activity 2: Radar Map: April 21, 1 pm - Alaska Mainland

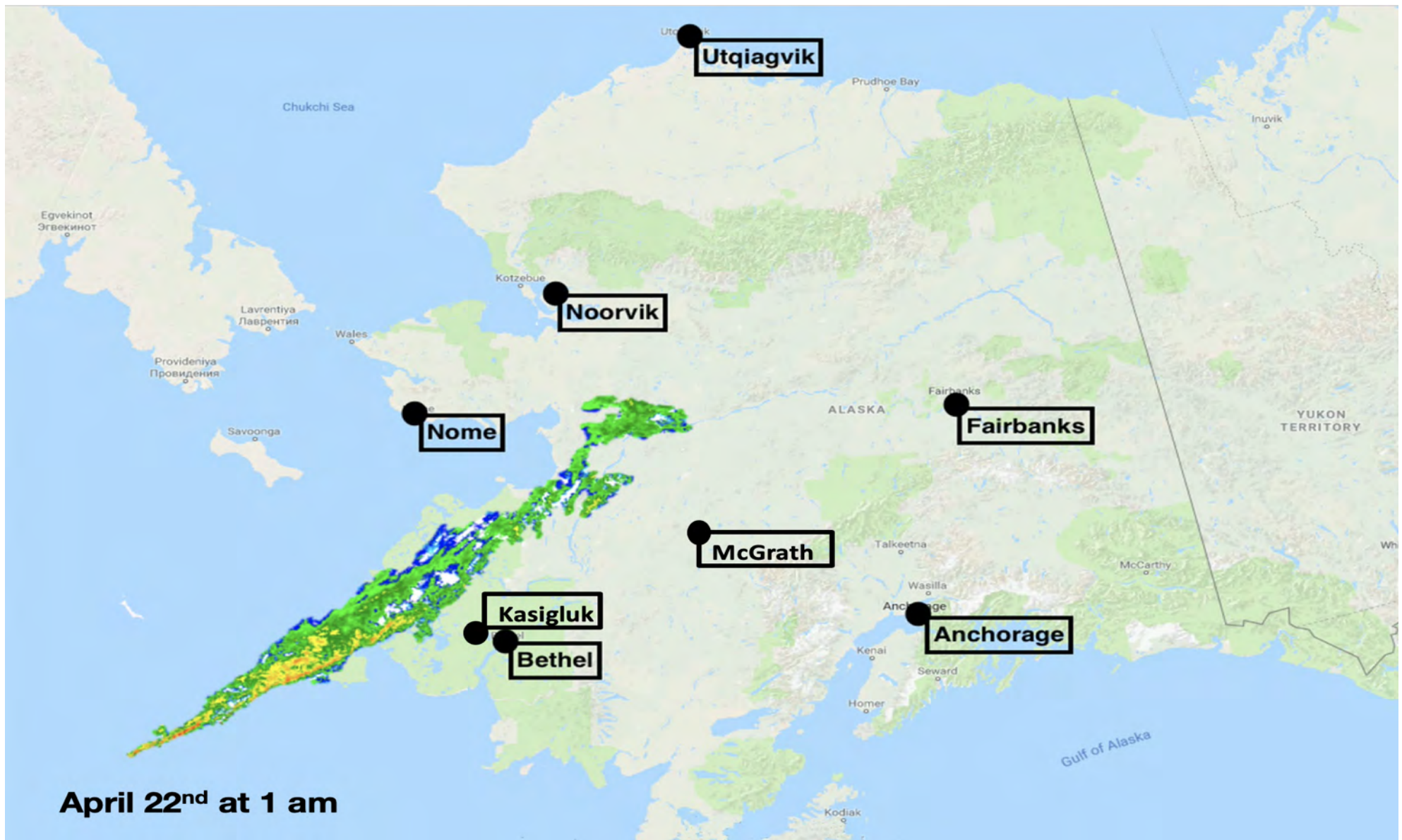


## Lesson 1, Activity 2: Radar Map: April 21, 7 pm - Alaska Mainland



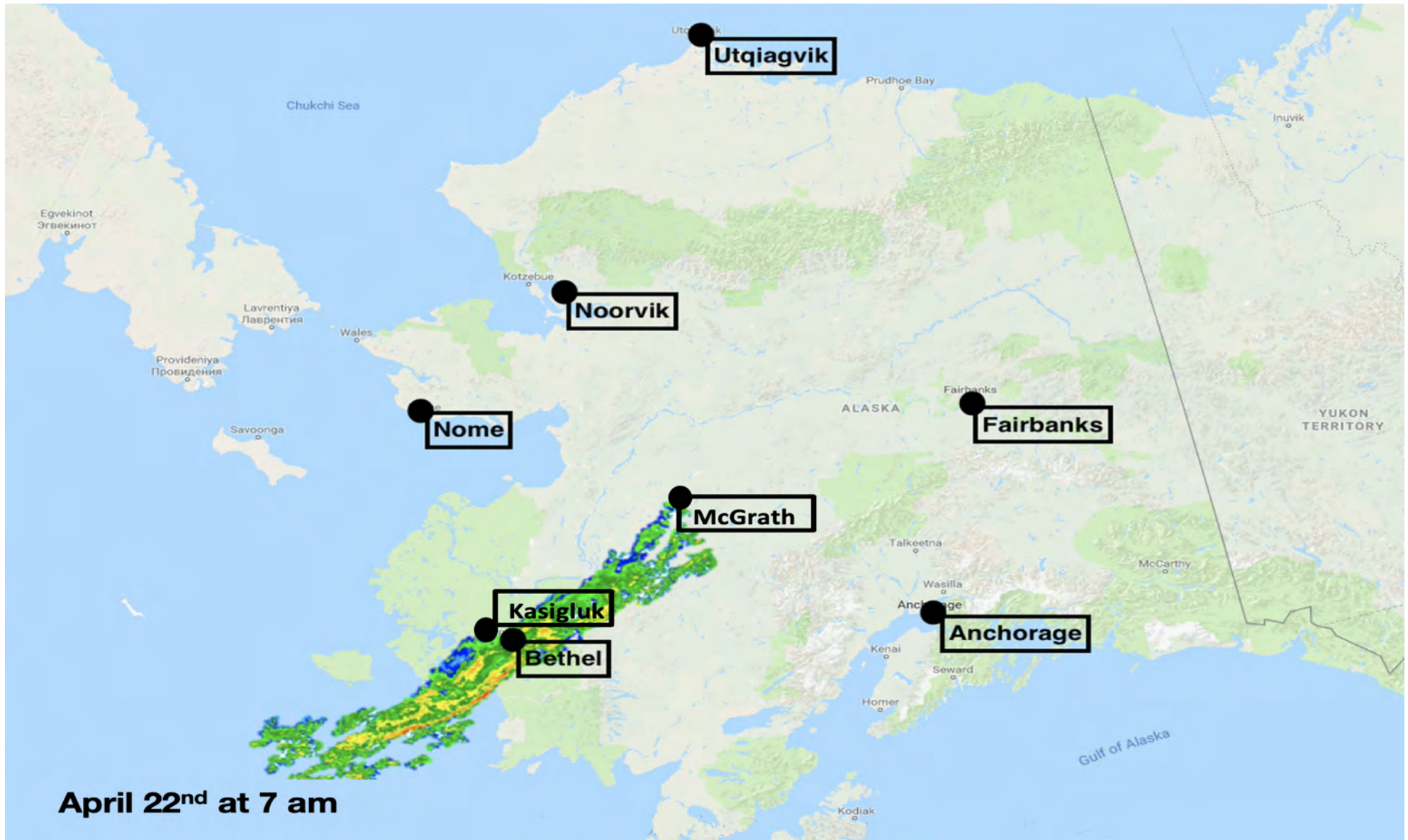


## Lesson 1, Activity 2: Radar Map: April 22, 1 am - Alaska Mainland





## Lesson 1, Activity 2: Radar Map: April 22, 7 am - Alaska Mainland



**NOTES:**



# Lesson 2

## Virtual Storm Tracker

Designate one person in your Research Team to track the Virtual Storm and record the data from the Weather Map Grids posted in your classroom onto this sheet. Be sure to mark where there is precipitation.

7:00 AM

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							
6							
7							

11:00 AM

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							
6							
7							

3:00 PM

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							
6							
7							

7:00 PM

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							
6							
7							



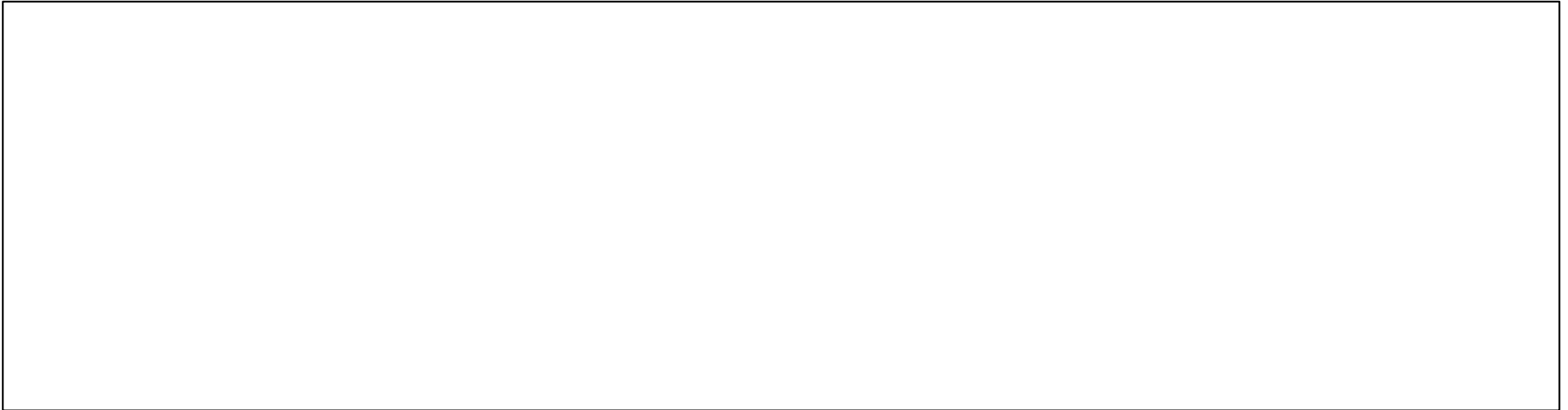
**NOTES:**

# Lesson 3

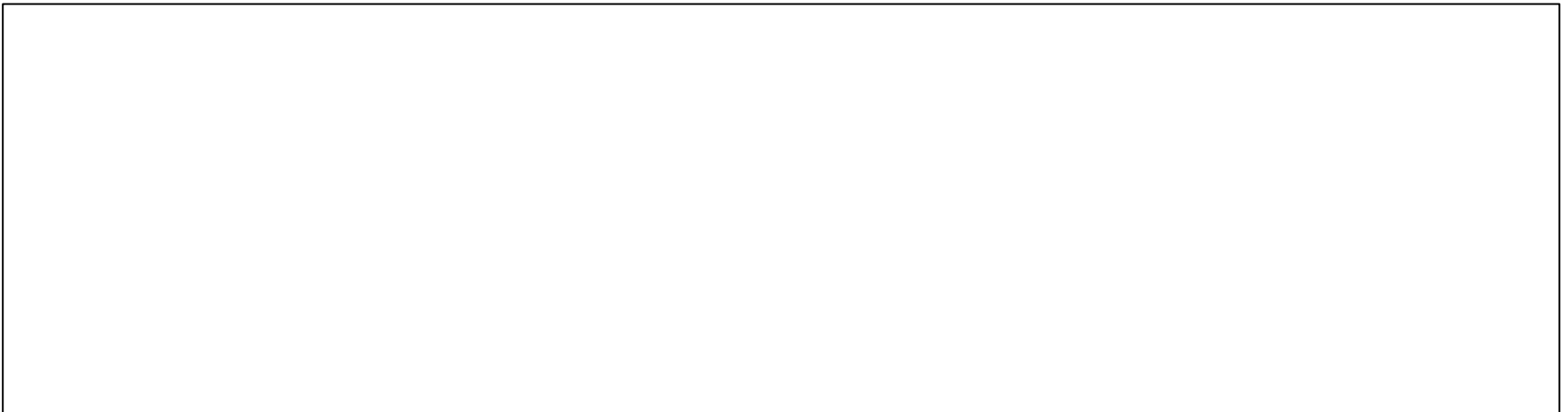


### Lesson 3: Research Team Questions

Look at your classroom weather map for 3 pm. What patterns do you see when looking at both precipitation and temperature?

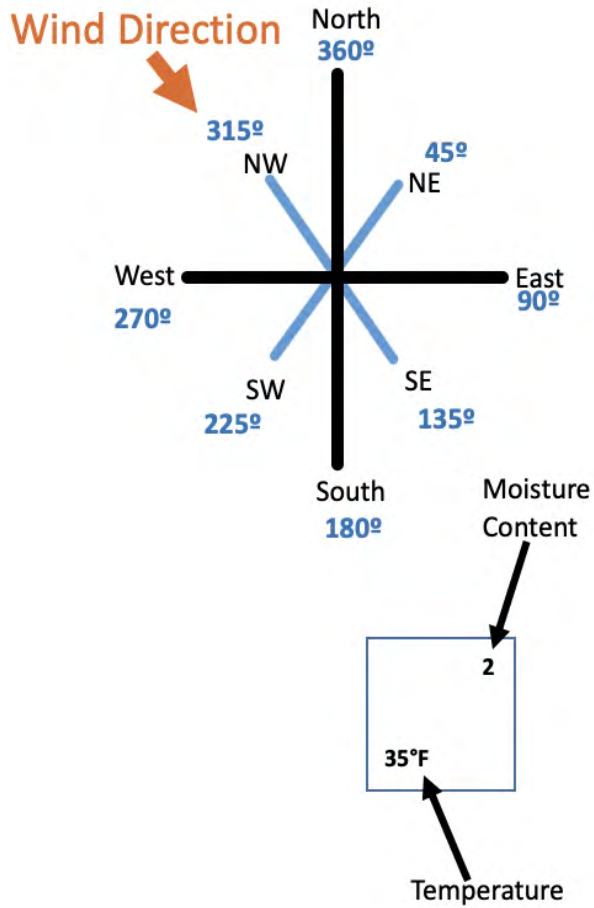


Look at your classroom weather map for 3 pm. What relationships do you see between temperature, air moisture, and rain?



# Lesson 4

# Lesson 4, Activity 1: Weather Map 7 pm with Precipitation & Air Moisture Content



	A	B	C	D	E	F	G
1	2 35°F	2 35°F	2 36°F	3 38°F	3 40°F	4 40°F	4 40°F
2	3 38°F	3 39°F	3 39°F	3 40°F	4 42°F	4 42°F	4 42°F
3	3 41°F	4 41°F	4 40°F	4 41°F	5 45°F	5 46°F	7 47°F
4	4 43°F	4 42°F	4 42°F	5 45°F	6 51°F	7 35°F	8 35°F
5	4 44°F	5 43°F	5 47°F	5 47°F	8 54°F	8 58°F	9 62°F
6	5 47°F	5 47°F	6 48°F	6 51°F	9 60°F	9 61°F	9 62°F
7	6 52°F	7 53°F	7 55°F	8 59°F	9 62°F	9 63°F	9 64°F

**NOTES:**

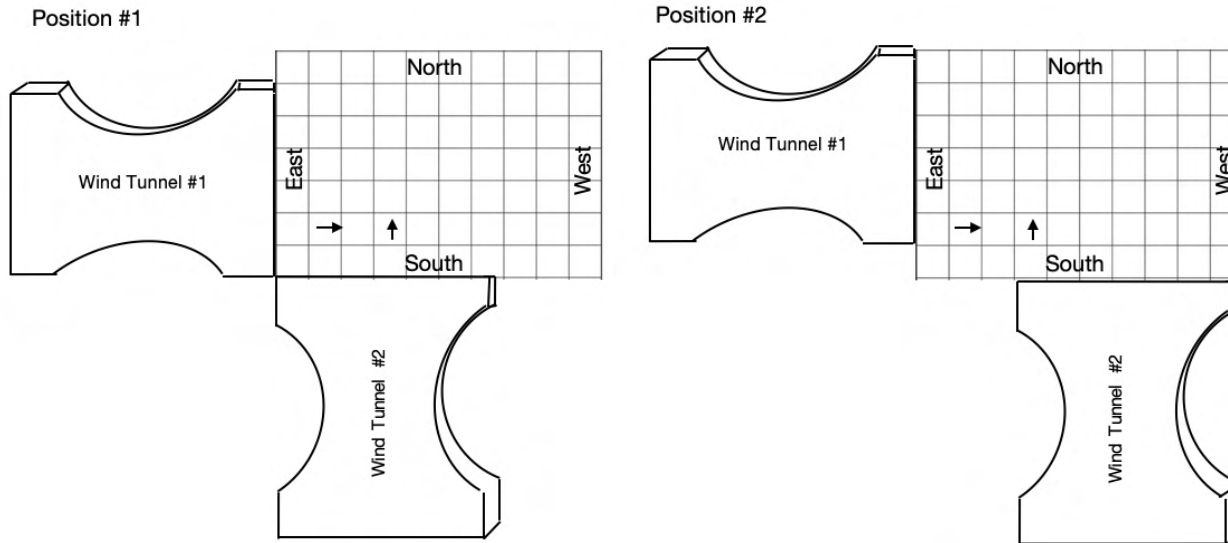


# Lesson 5

## Lesson 5, Activity 1: Wind Table

Your teacher will assign your Research Team a Wind Table Position number. Place wind tunnel #1 and wind tunnel #2 according to the diagram below for your assigned Team. Keep the following things in mind as you explore patterns of the wind:

- **\*\*BE CAREFUL NOT TO PUT YOUR FINGERS NEAR THE FAN\*\***
- Graph paper represents a region.
- A wind vane can be placed anywhere on the graph paper to determine what direction the wind is coming from.
- Record the wind direction by drawing an arrow in the direction the wind vane is pointing. (Recall that wind is always recorded showing the direction the wind is coming from.) If there is not a clear determination where the wind is coming from, then leave the square blank.
- Place a Styrofoam on the wind table to see the interaction between the two air masses.



Record your observations below.

## Lesson 5, Activity 2: Additional Weather Station Data

Day & Time	Temp (F°)	Moisture	Wind Direction
April 21 7am	50	10	315
April 21 9am	40	7	310
April 21 11am	37	6	310
April 21 1pm	33	6	315
April 21 3pm	32	6	315
April 21 5pm	32	6	320
April 21 7pm	34	6	320
April 21 9pm	33	6	320
April 21 11pm	31	6	320
April 22 1am	32	6	320
April 22 3am	31	6	320
April 22 5am	32	6	320
April 22 7am	34	6	300

Day & Time	Temp (F°)	Moisture	Wind Direction
April 21 7am	37	4	147
April 21 9am	36	4	164
April 21 11am	36	4	175
April 21 1pm	36	4	173
April 21 3pm	37	4	200
April 21 5pm	39	5	181
April 21 7pm	41	5	193
April 21 9pm	42	6	183
April 21 11pm	43	6	190
April 22 1am	43	7	190
April 22 3am	45	6	194
April 22 5am	46	6	208
April 22 7am	48	6	330

Day & Time	Temp (F°)	Moisture	Wind Direction
April 21 7am	43	5	170
April 21 9am	44	5	197
April 21 11am	43	5	177
April 21 1pm	43	6	167
April 21 3pm	44	6	170
April 21 5pm	45	6	168
April 21 7pm	47	7	180
April 21 9pm	49	8	190
April 21 11pm	49	8	178
April 22 1am	50	8	200
April 22 3am	51	8	180
April 22 5am	52	8	168
April 22 7am	54	8	290

Day & Time	Temp (F°)	Moisture	Wind Direction
April 21 7am	40	4	170
April 21 9am	41	4	197
April 21 11am	40	5	177
April 21 1pm	40	5	167
April 21 3pm	41	5	170
April 21 5pm	42	6	168
April 21 7pm	44	6	180
April 21 9pm	46	7	190
April 21 11pm	46	7	178
April 22 1am	47	7	200
April 22 3am	48	7	180
April 22 5am	49	6	168
April 22 7am	50	5	290

Day & Time	Temp (F°)	Moisture	Wind Direction
April 21 7am	43	5	90
April 21 9am	44	5	91
April 21 11am	43	5	90
April 21 1pm	43	6	112
April 21 3pm	44	6	118
April 21 5pm	45	6	124
April 21 7pm	47	7	130
April 21 9pm	49	8	164
April 21 11pm	49	8	190
April 22 1am	50	8	200
April 22 3am	51	8	200
April 22 5am	52	8	179
April 22 7am	54	8	195

**Point Lay**

**Utqiagvik**

**Bettles**

**Galena**

**St. Mary's**

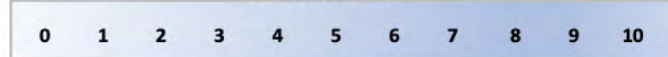
**McGrath**

**Kasigluk**

**Anchorage**

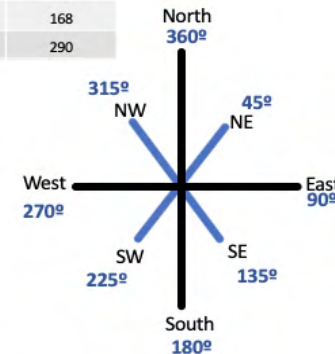
**Cape Newenham**

Air Moisture Scale



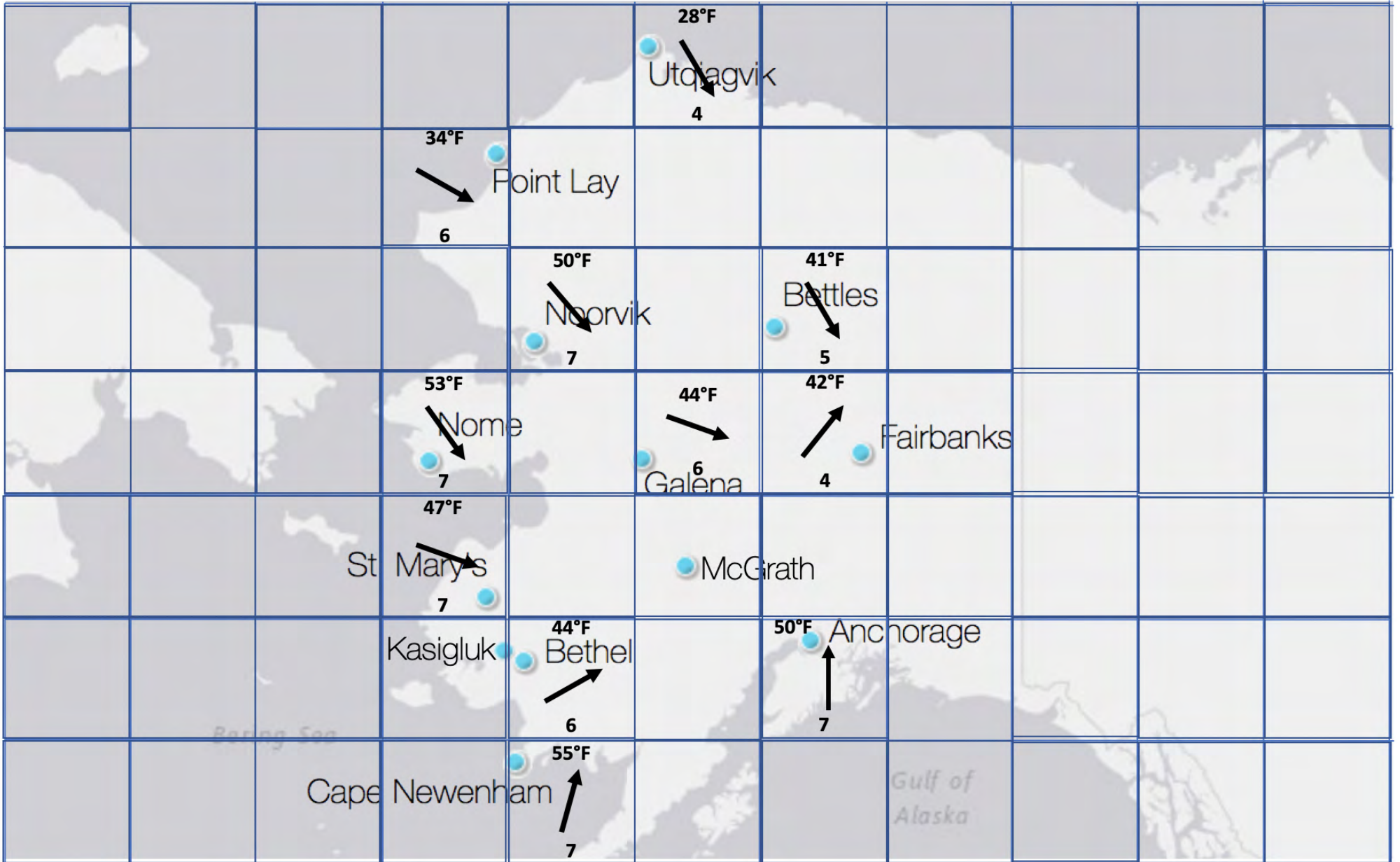
Very Dry Air

Very Moist Air



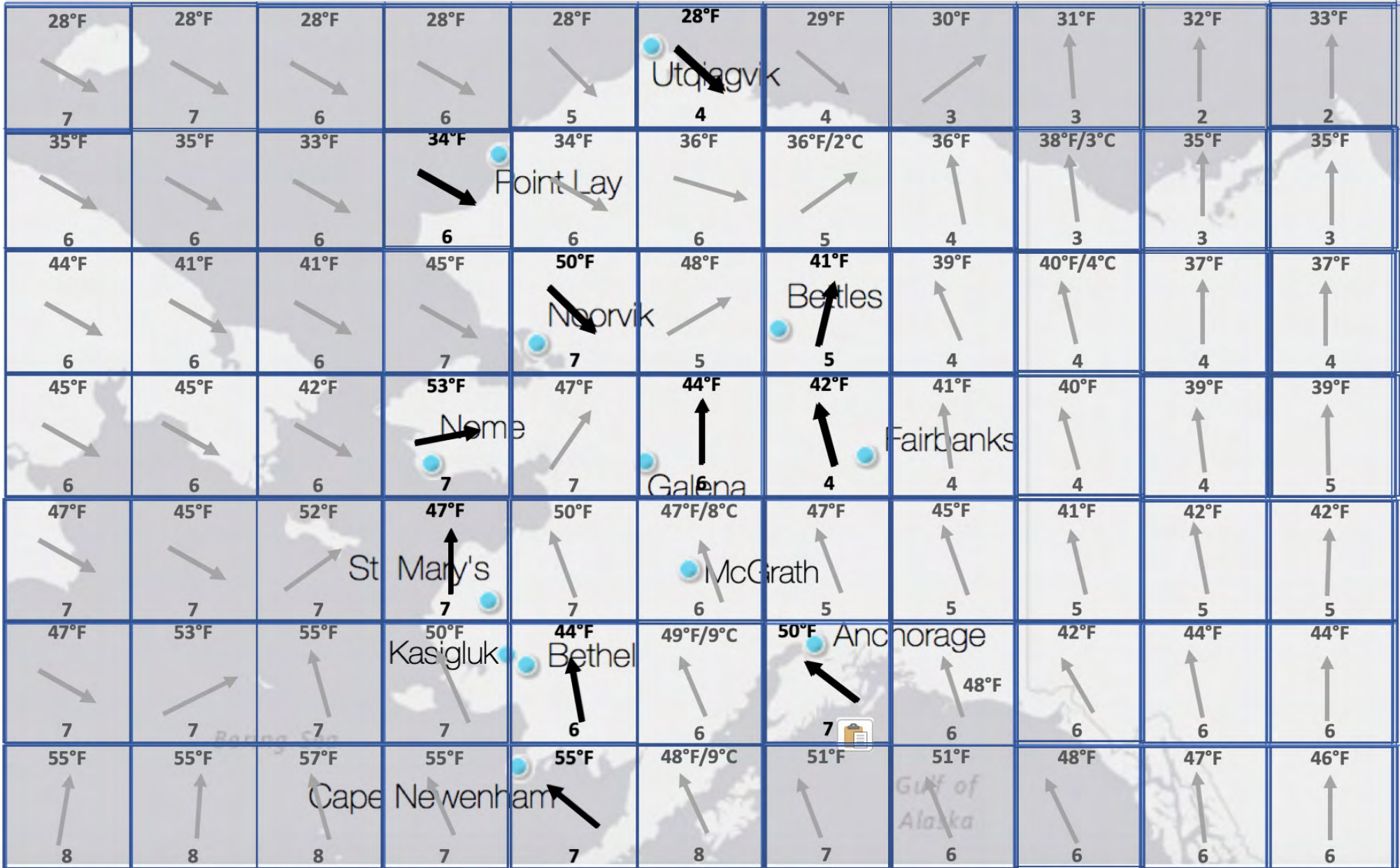
Wind direction is determined by what direction the wind is coming from and recorded in degrees.

Lesson 5, Activity 2: Weather Stations 7 pm Readings





### Lesson 5, Activity 2: Weather Stations 7 pm Interpolated



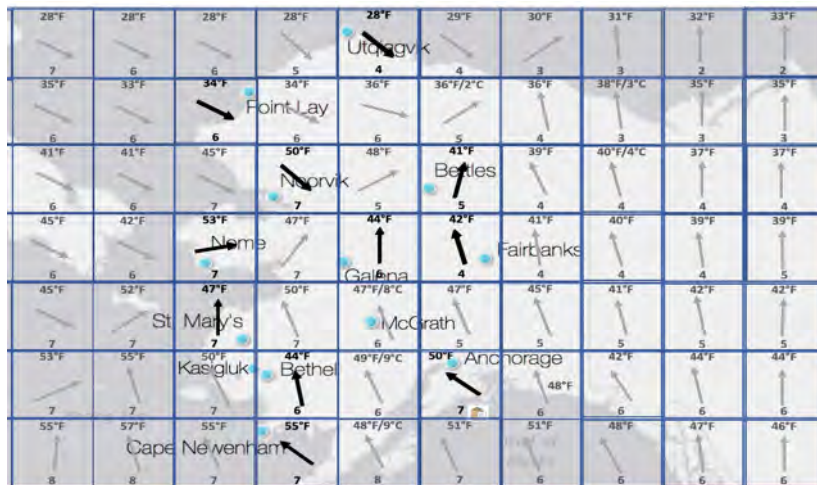
## Lesson 5, Activity 2: 7 pm Weather Station Data and 7 pm Radar Map

Discuss the questions below with your Research Team and write your answer in the spaces provided. When you are happy with your answer, enter it into the online student activity.

Question #5.1. Using the 7 pm Interpolated map and the 7 pm Radar Map below, write a general statement that answers the question, “How do air masses affect where it rains?”

Question #5.2. What properties of the air masses cause it to rain? Example answer: If....and if...then it rains?

Redraw the air masses below on the interpolated map.



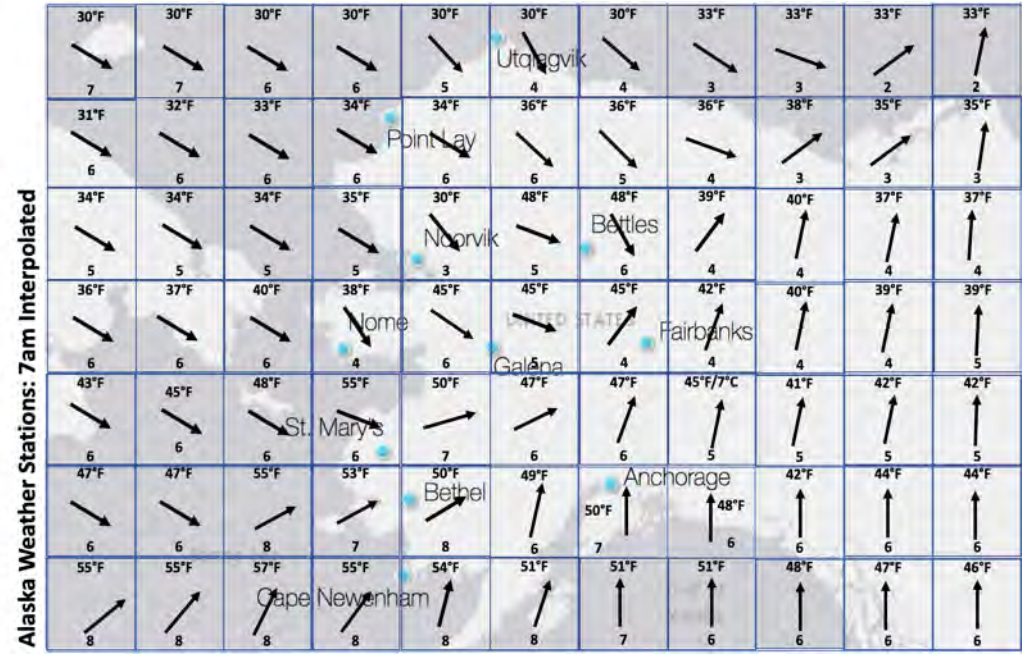
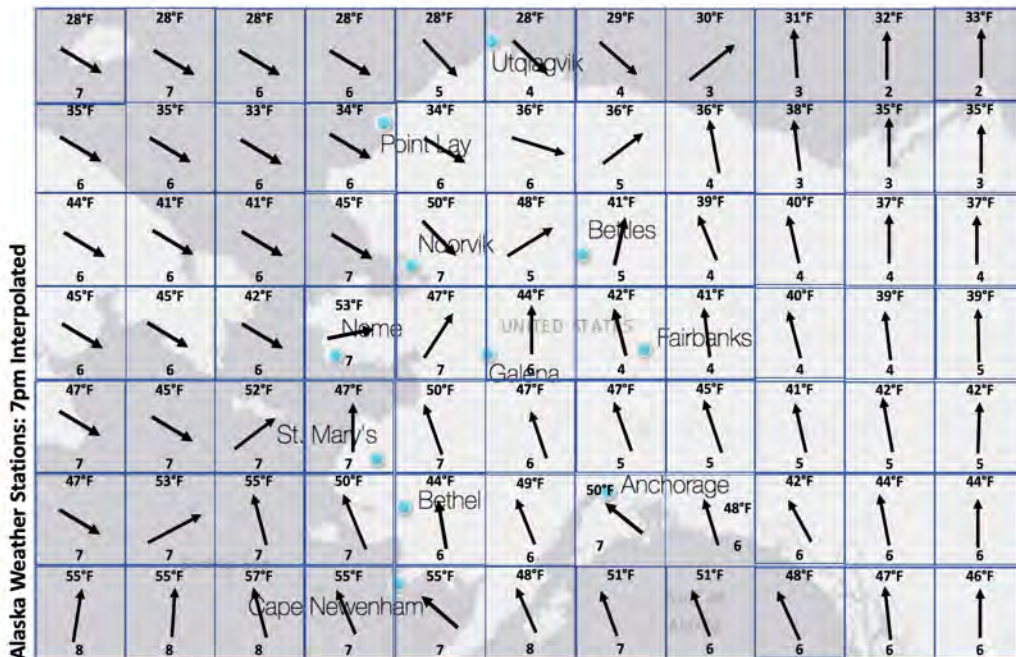
The radar map shows where it is raining.





## Lesson 5, Activity 2: 7 am Weather Station Data

Question #5.3. Circle the air masses on the 7 am Weather Station data map and make a prediction where you think it could be raining at 7 am and draw rain drops in that area on the map. Explain why you think it could be raining in the area you selected. When you are happy with your answer, enter it into the online student activity.



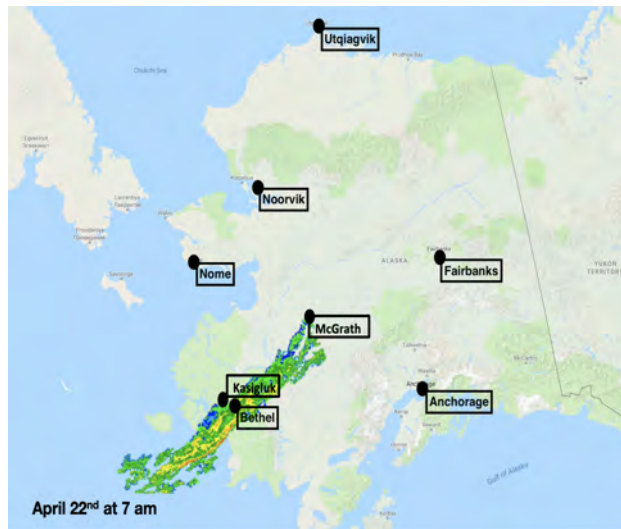
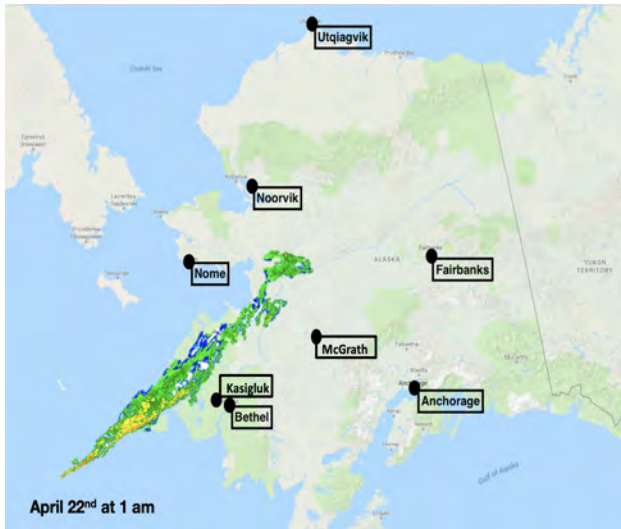
**NOTES:**



# Lesson 6

## Lesson 6, Activity 1: How Do Fronts Move?

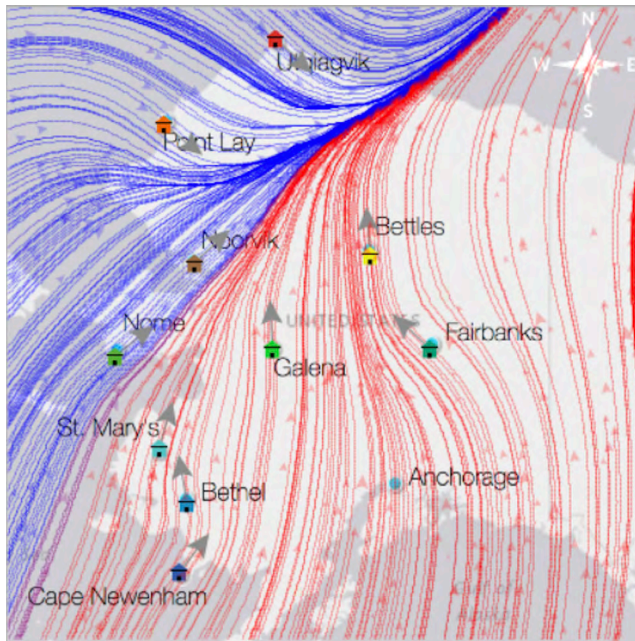
Review the Lesson 1, Activity 2, Weather Radar Maps below to answer the question “What do we need to know about the front to predict where it will be in the future?” and write your answer below:



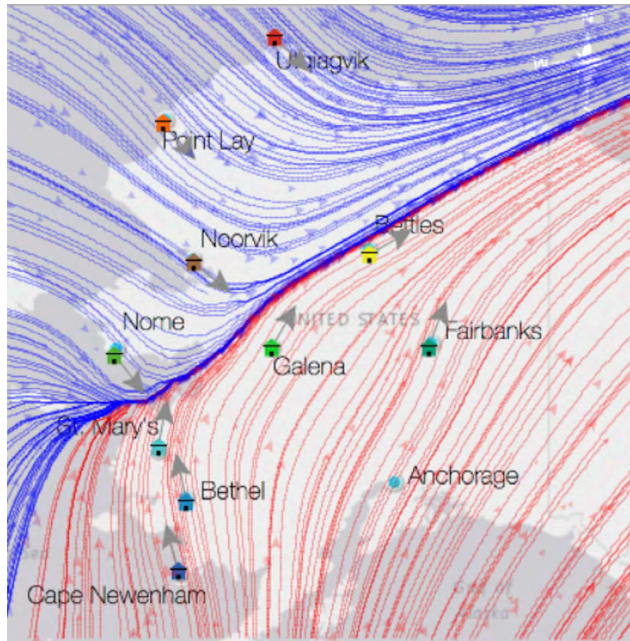
## Lesson 6, Activity 2: Tracking the Front

Based on the Virtual Model that your teacher demonstrated that showed the movement of the front, discuss with your Research Team and answer the question, “In what direction is the front moving?” below:

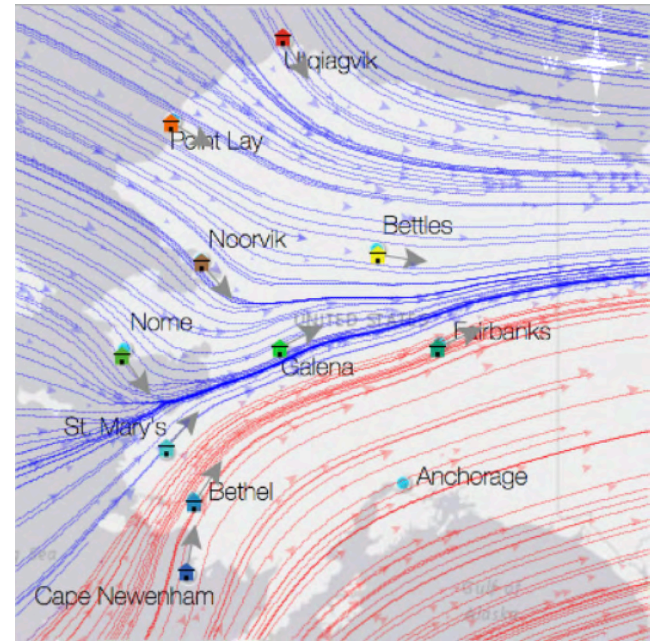
Front on April 21, 11 am



Front on April 21, 9 pm

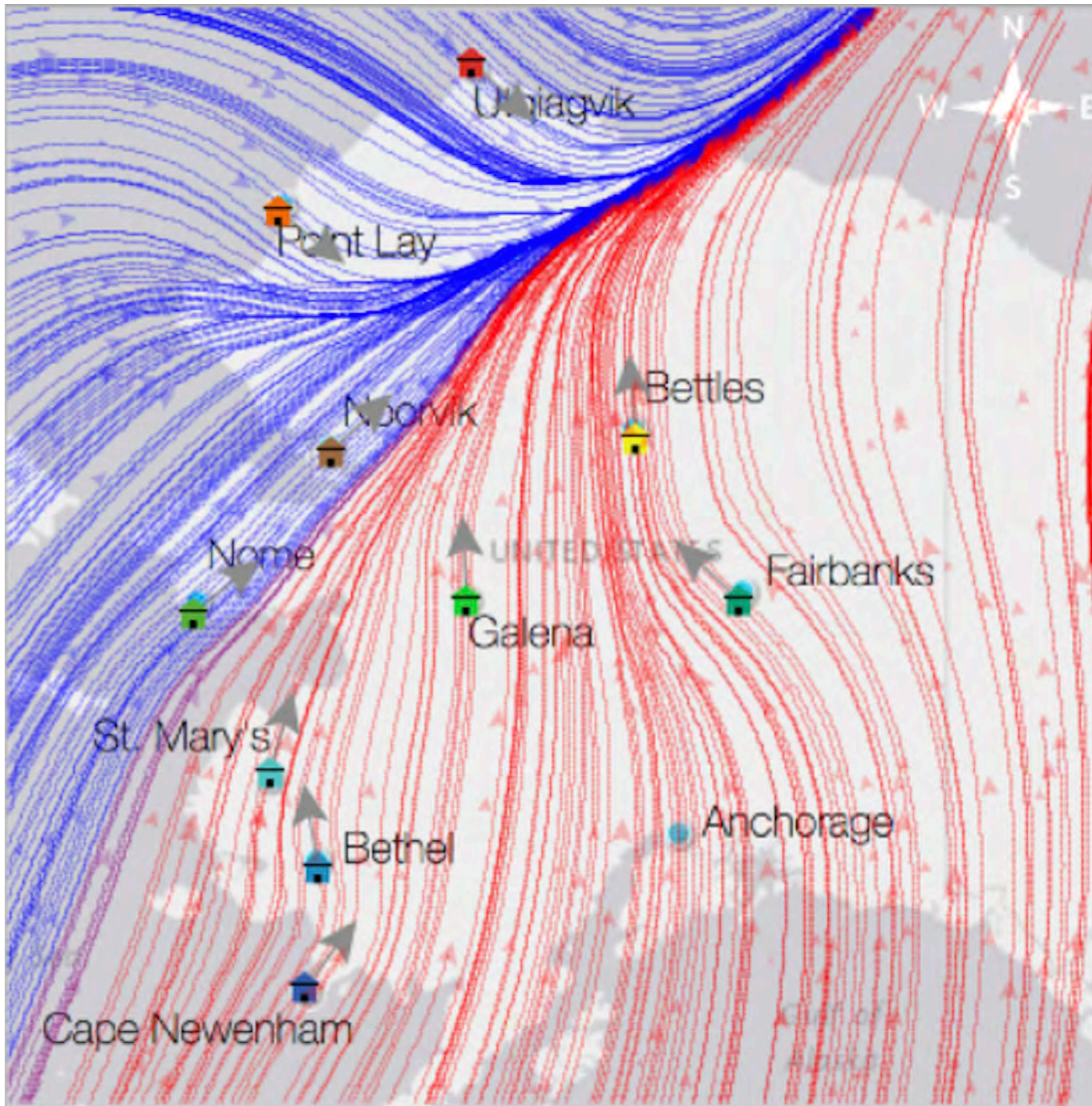


Front on April 22, 7 am



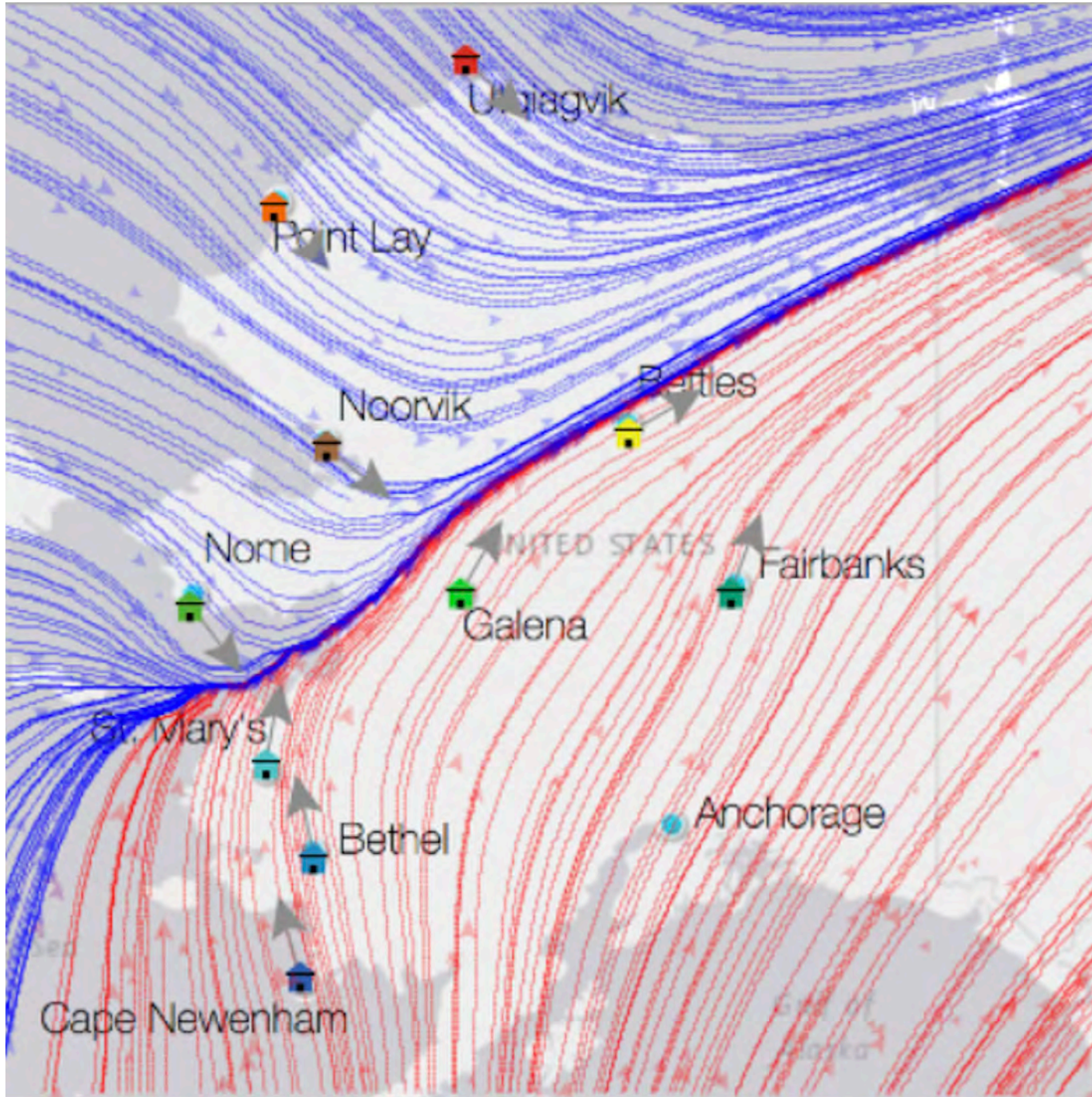


Lesson 6, Activity 2: Front on April 21, 11 am



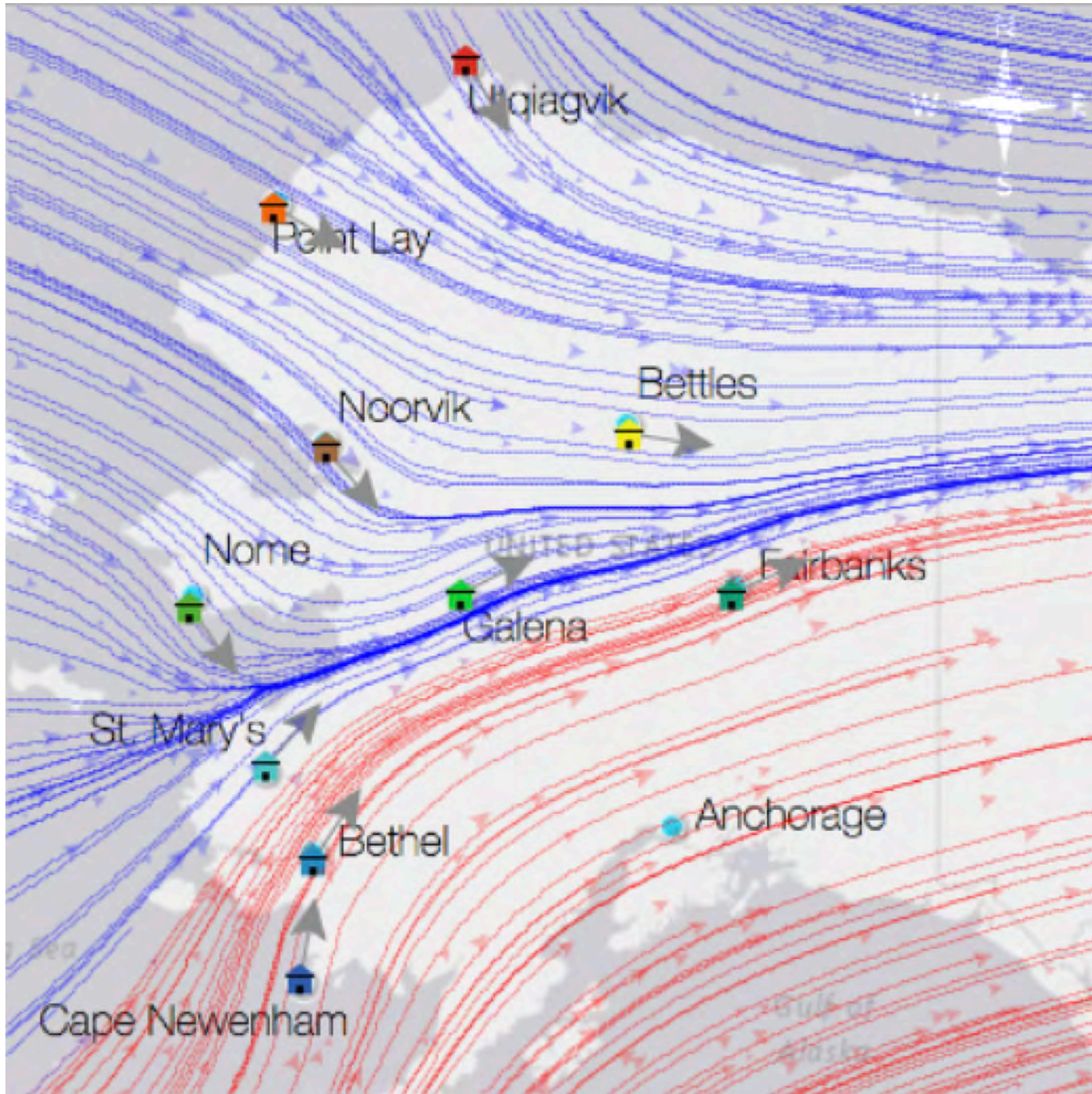


Lesson 6, Activity 2: Front on April 21, 9 pm





Lesson 6, Activity 2: Front on April 22, 7 am



**NOTES:**

# Lesson 7



## Lesson 7: Analyzing Data and Making a Prediction

Your team's task for this lesson is to create a Weather Forecast by writing a script and then presenting it using Screencast-o-matic for the Alaskan Native Youth Olympics (NYO Games) planning committee. You will use information and the skills you have developed in previous lessons. In the spaces provided below write a tip that you learned from each lesson that you may want to include in your forecast. Please see examples below:

Lesson 1: Making a predication without data can be difficult...

Lesson 2: What we learned about interpolation...

Lesson 3: There is a connection between air moisture and precipitation...

Lesson 4: The rule we created to test in the model is...

Lesson 5: Air masses affect weather by or because...

Lesson 6: The front is estimated to be moving at a speed of...

Please use the space below to write your script for your presentation:

**Script:**