

Naming Winter Storms

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The Weather Channel

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ATHENA	HELEN	ORKO	VIRGIL
BRUTUS	IAGO	PLATO	WALDA
CAESAR	JOVE	Q	XERXES
DRACO	KHAN	ROCKY	YOGI
EUCLID	LUNA	SATURN	ZEUS
FREYR	MAGNUS	TRITON	
GANDOLF	NEMO	UKKO	

The Weather Channel Decided To Name Winter Storms in 2011

- Social Media – Twitter
- Allows for use of (#) hashtags to identify the winter system.
 - October 2011 “Snowtober” storm made that **VERY** apparent
 - Made perfect sense to name from a marketing standpoint **
- Naming a storm can raise awareness in the same way that a named hurricane does
- Allows us to reference past storms

Weather Systems Are Named in U.S

- Snowtober
- Snowmageddon
- Snowquester
- Frankenstorm
- President's Day Storm
- Groundhog Day Storm
- "Car"mageddon

Weather Systems Are Named in Europe



UK STORM CENTRE

WHY ARE WE NAMING STORMS?

'Name our storms' is a pilot project between the Met Office and Met Éireann which aims to increase awareness of severe weather and ensure greater safety of the public.

Over the course of 2016/17 wind storms with the potential to affect the UK and/or Ireland will be given a name to help effective communication of the storm and its impacts.

UK STORMS 2016/17

A-Z of UK storm names 2016/17

Name	Date named	Date of impact on UK and/or Ireland
Angus	19 November 2016	20 November 2016
Barbara	20 December 2016	23 - 24 December 2016
Conor	23 December 2016	25 - 26 December 2016
Doris	21 February 2017	23 February 2017
Ewan	25 February 2017	26 February 2017 (Ireland)
Fleur		

Weather Systems Are Named in Europe

STORM BARBARA

23 - 24 December 2016 - Storm Barbara brought strong winds to the UK with warnings issued during the festive getaway.

STORM BARBARA IMPACTS

Windy weather was experienced across the country, but the focus of the storm was on parts of north and northwest Scotland.

Over 100 schools were closed in the Highlands were forced to close while train and bus services were disrupted and ferries to the Northern and Western Isles were cancelled.

Two planes attempting to land at Stornoway airport were unable to land and forced to return to Aberdeen and Inverness.

A subsequent warning was also issued for 26 December 2016 with more strong winds following shortly after named [Storm Conor](#).

Storm Angus - Maximum gust speeds (mph)

Site Name	Area	Max Gust (mph)
Sella Ness	Shetland Islands	83
Sule Skerry	Orkney	78

How Are Winter Storms Different From Hurricanes

- Unlike other severe storms, winter storms **impacts** are usually associated with **travel**/commerce.
- Road travel
 - Will I be able to get to work or school ?
 - Will businesses close ?
 - Commerce and Long distance travel (I-70, I-80, I-90)
- Air travel – airport impacts, especially hubs
 - Chicago, New York, Washington, Philadelphia

Winter Storm Naming Guidelines

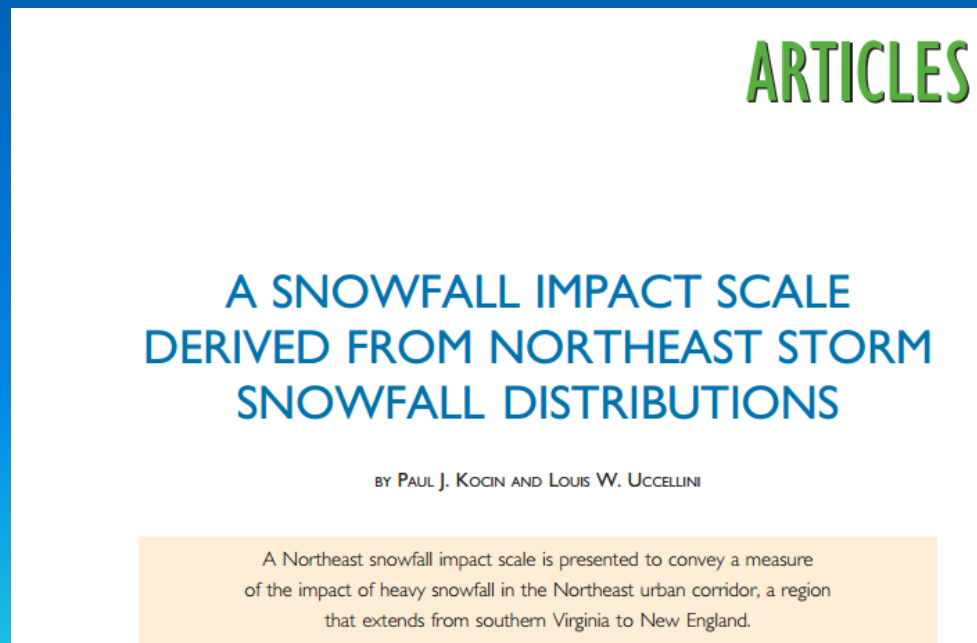
- It's The Weather Channel
- We cover weather on a **Regional and National** Scale
- Therefore we assess storms that have regional to national scale impacts
- Two specific parameters to gage those impacts on that scale
 - Population
 - Areal Coverage
- Impacts are defined based on thresholds set by the **National Weather Service** for Winter Weather Warnings

Why Base Naming on National Weather Service ?

- Winter Weather Warning Program is Time Tested
- Offices Base Warning Thresholds on Local Impacts
- Examples of Criteria for Warnings Based on Location:
 - Atlanta GA – 2 inches of snowfall in 24 hours
 - Burlington VT – 9 inches of snow in 24 hours
- A result of using NWS Warning thresholds is a leveling of the playing field for winter weather impacts across the nation.

Developing a More Quantitative Approach To Naming Winter Storms

- Based on Published Winter Storm Ranking
 - NESIS (Northeast Snowfall Impact Scale)
- NESIS Used Three Main Components For Ranking
 - **Snowfall, Population, Area**



Developing a More Quantitative Approach To Naming Winter Storms

- The Weather Channel Follows That Same NESIS Model
- Two Main Parameters For Naming Winter Storms
 - **Population (A minimum of 2 million)**
 - **Areal Coverage (An Area of at least 400,000 sq. km)**
 - **Who Are Under or Expected to Go Under NWS Winter Storm Warnings**

Next We Show How We Got To Those Numbers

Calibrating Winter Storms Using IMPACT

Integrated Meteorological Population and Area Calculation Tool

- After the 2012-13 Season we went back and reviewed all named storms.
- Of 27 named storms we felt at least 90% produced regional/national scale impacts to be named.
- Therefore we used these storms as a calibration for naming future storms based on the population and area impacted by those storms.
- 2012/13 season storms we plotted on an x-axis (population) and y-axis (area)
- Values were then derived for minimum population and area impacted. See next page

Calibrating Winter Storms Using IMPACT

Integrated Meteorological Population and Area Calculation Tool

2012/13 Storms Evaluated For:

NWS Warnings

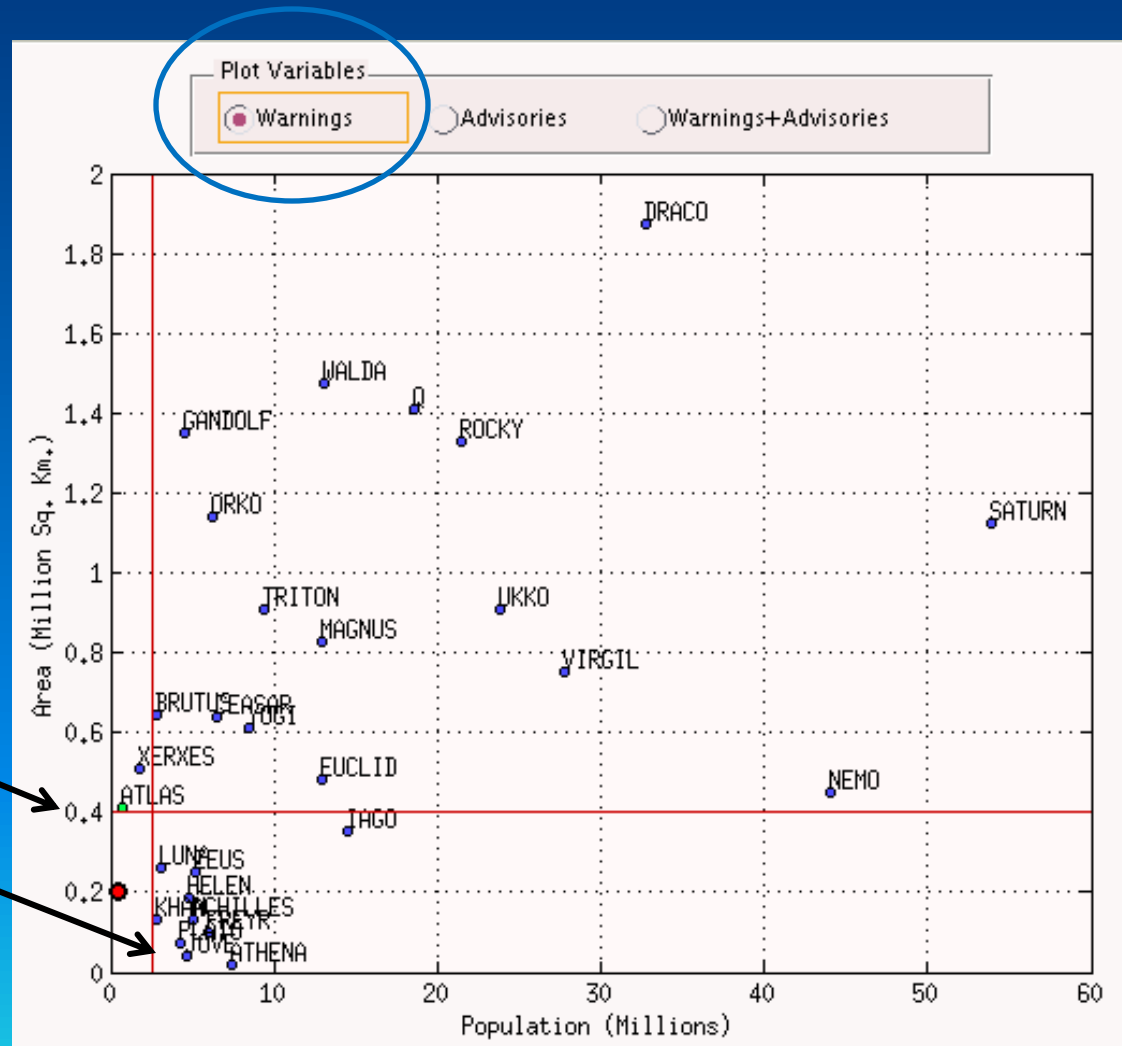
Area (y-axis)

Population (x-axis)

Numbers chosen based on the plots of 2012-13 named storms

NWS Warnings:

- 400,000 sq. km.
- 2 million people



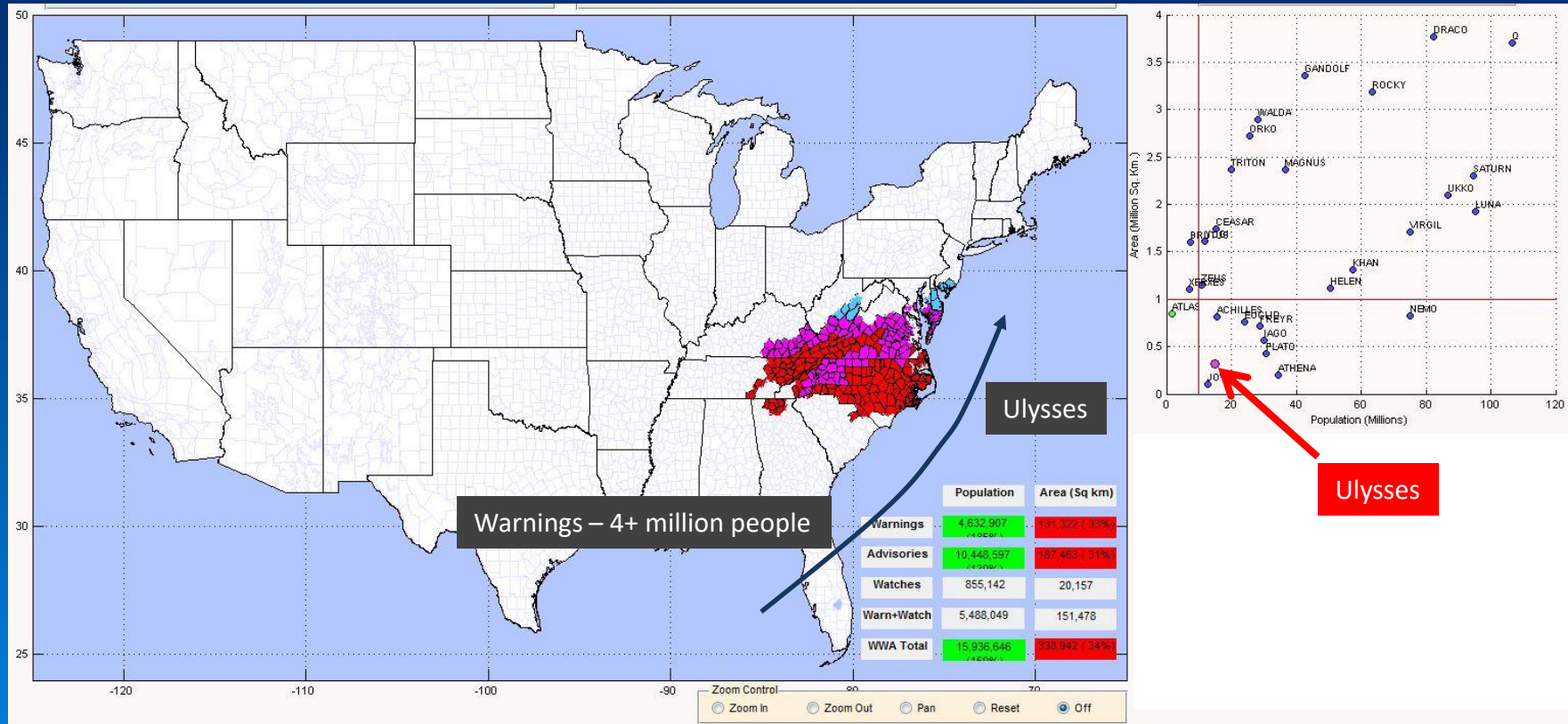
IMPACT

Integrated Meteorological Population and Area Calculation Tool

At least one of these conditions has to be met or is expected to be met

Product	Population	Area
NWS Winter Storm Warnings	2,000,000	400,000 sq. km.

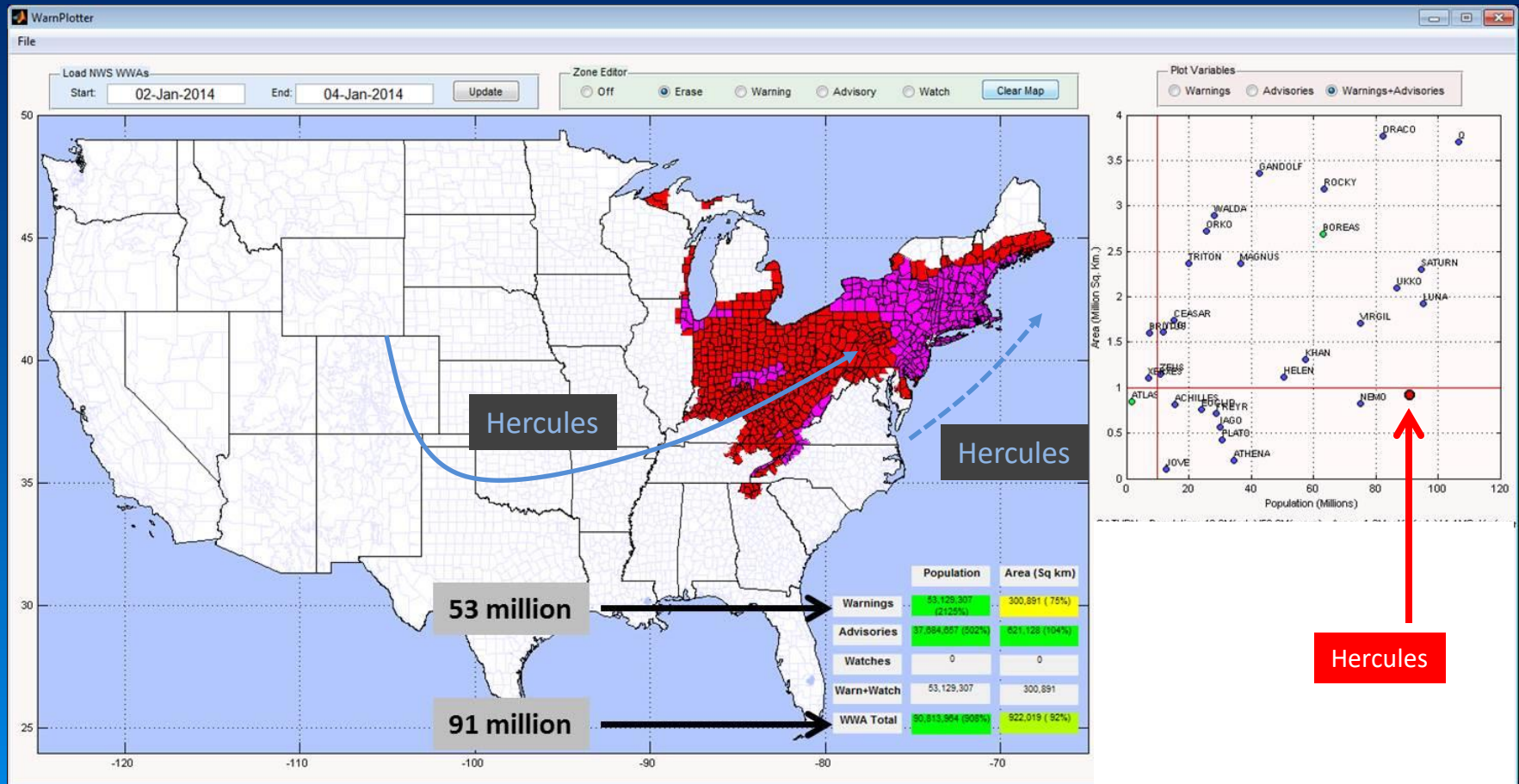
Example of a high population but relatively low area winter storm



WINTER STORM ULYSSES		TOP SNOW, ICE TOTALS	
MT. MITCHELL, NC	*	15"	
BUSICK, NC	*	10"	
MARTINSVILLE, VA	*	7"	
NC: ASHEBORO, LEXINGTON, SALISBURY, WELCOME		UP TO 1 1/2" ICE	
		TREE DAMAGE, POWER OUTAGES	

Ulysses was a winter storm that did not impact a huge area. However it did impact a large population, over 4 million residents, along portions of North Carolina through Western Virginia. At one point over 400,000 Customers were without power in N. Carolina alone.

Example of a high population and large area coverage



Hercules was a major winter storm that covered a long track from the Rockies to the East Coast. Major impacts for over 50 million people. Nearly 2 feet of snow in Massachusetts, Chicago Midway, Detroit and Boston all had more than a foot of snow and NYC 6 to 11". Snow as far south as KY and NC.

The Naming of Winter Storms Can Be a Complex Process

- Although many storms are clear cut, large scale, primary systems, there are many systems that have several features/phases that produce wintry impacts across the nation. That is why we have a committee of 3 meteorologists who decide when to name storms.
- On the next several slides I present an example of a more complex system and the rules we have adopted to tie together meteorological features into one named storm.

Cleon – December 1-7, 2013

Winter Storm Cleon delivered snow, sleet, and freezing rain to a large swath of the country from Dec. 1, 2013 into early Dec. 7, 2013.

- One of the main caveats with naming winter storms is the fact that it is often difficult to determine which weather feature may be associated with the winter storms. In some cases, there are secondary and even tertiary features that may produce winter impacts long after the main Low has exited the area. Winter Storm Cleon was a good example of that.
- Throughout the 5 years and over 125 winter storms we have named, there are certain rules we have adopted for the various types of winter storms that occur.

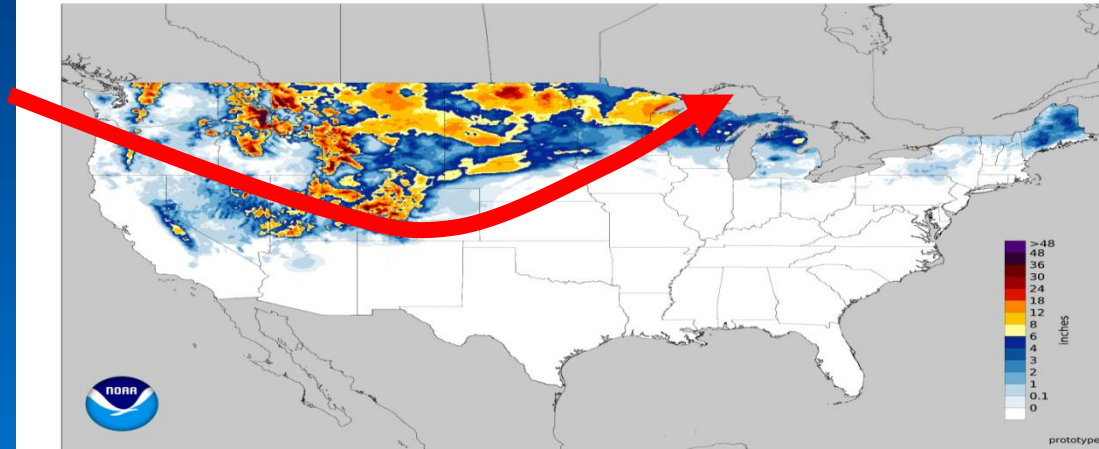
Rules That Have Been Adopted

- If wintry precipitation is all part of the same large scale trough across the U.S.
- And...if there is no more than a 12 to 24-hour break in the snowfall from one phase of the storm to the next
- System maintains its name

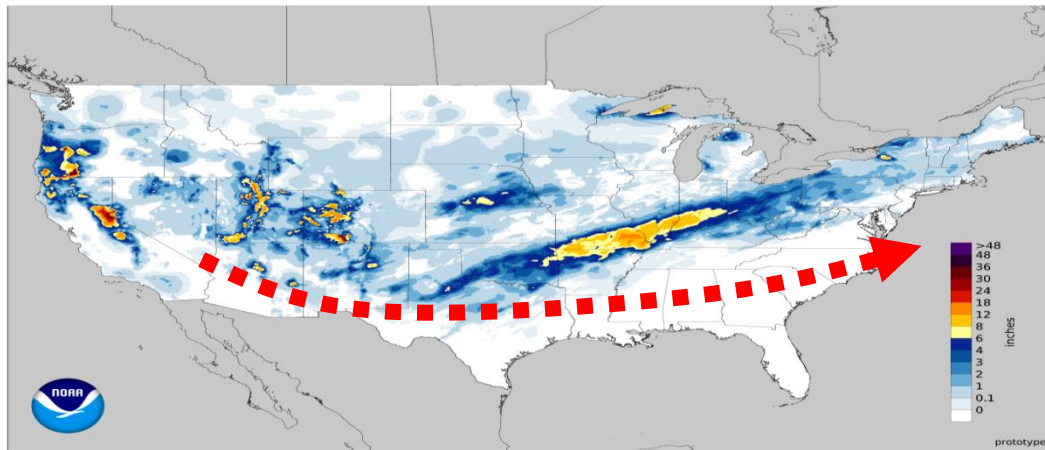
Cleon – December 1-7, 2013

Winter Storm Cleon was a good example of a system that had several meteorological features that produced a multiple phase event.

National Snowfall Analysis: 72-hour accumulation ending 2013-12-04 12 UTC
Issued 2017-04-09 03:29:02 UTC

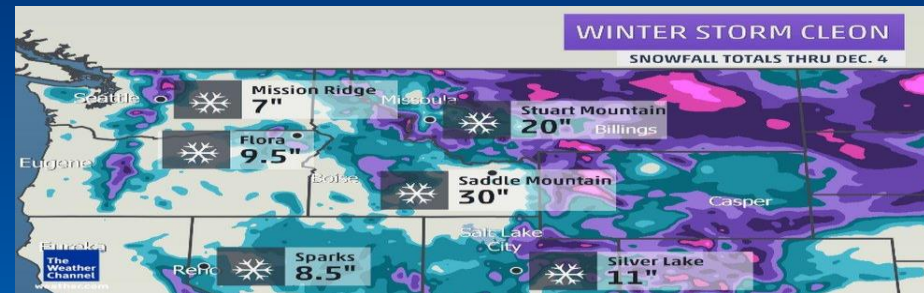
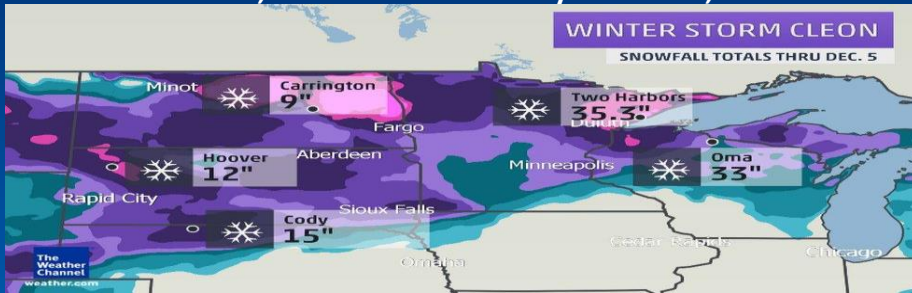


National Snowfall Analysis: 72-hour accumulation ending 2013-12-08 12 UTC
Issued 2017-04-09 04:44:48 UTC

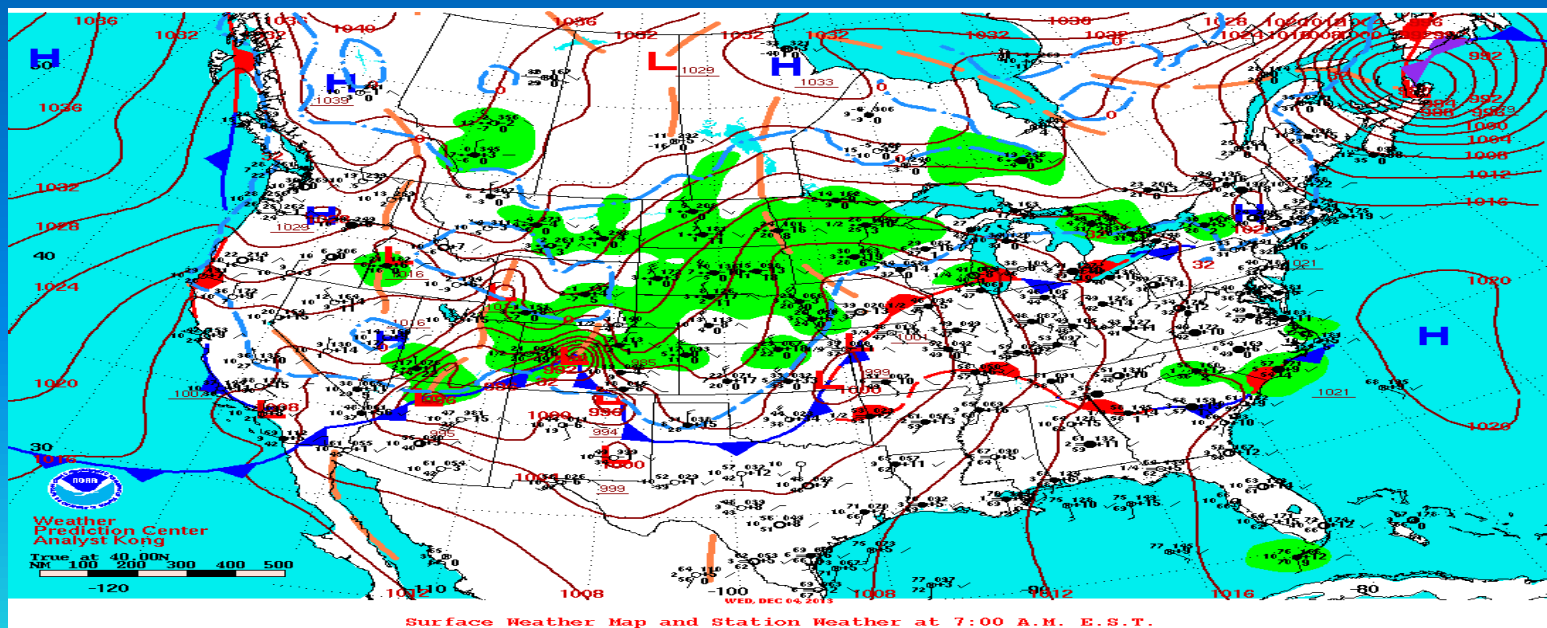
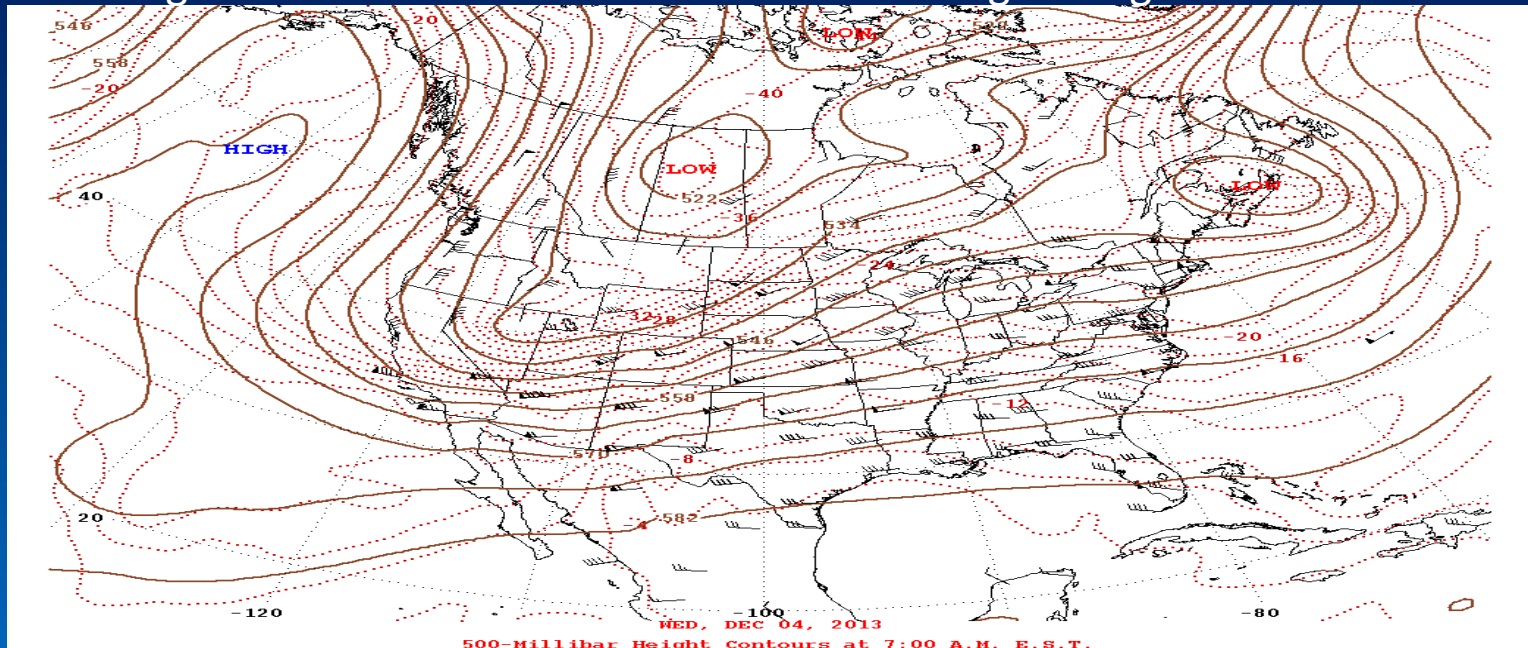


Cleon – December 1-7, 2013

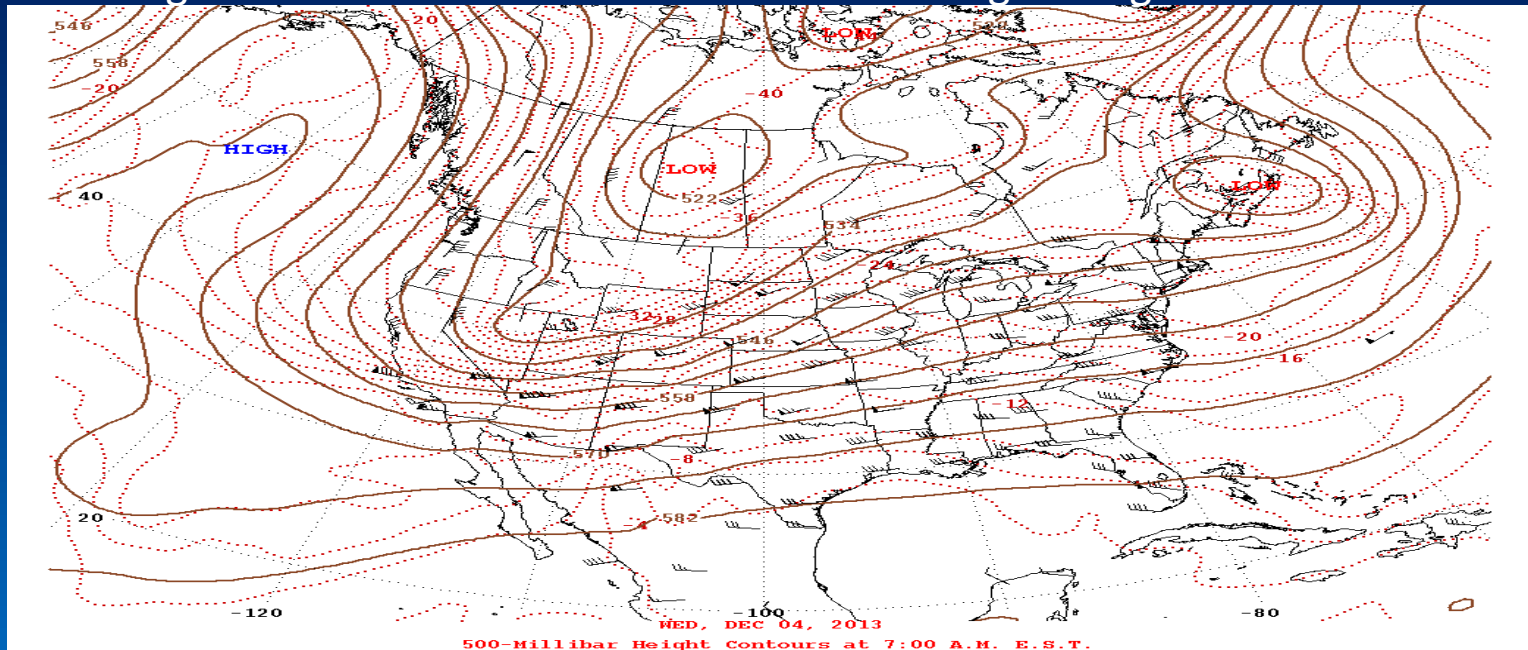
Winter Storm Cleon delivered snow, sleet, and freezing rain to a large swath of the country from Dec. 1, 2013 into early Dec. 7, 2013.



A main trough with several short wave features moving through

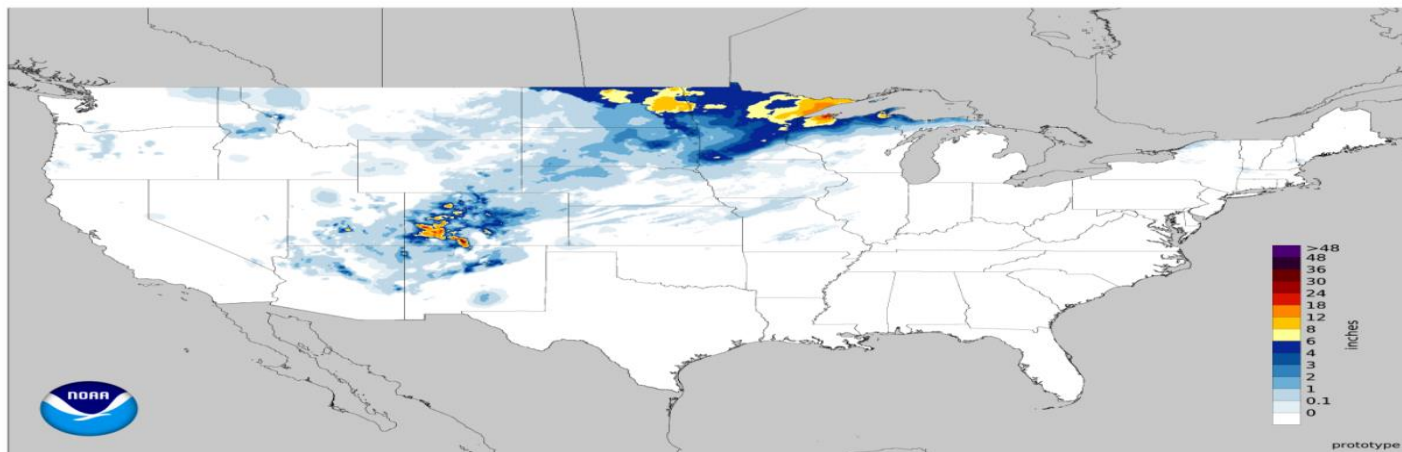


A main trough with several short wave features moving through

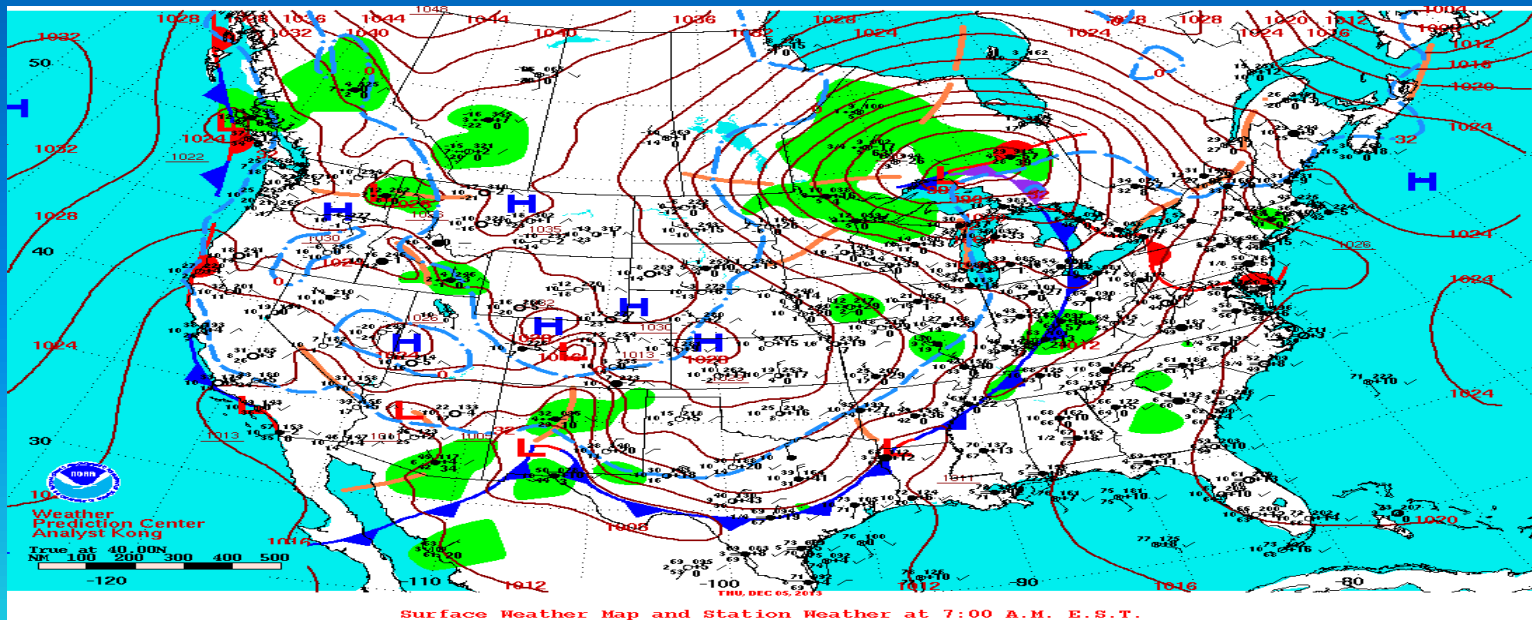
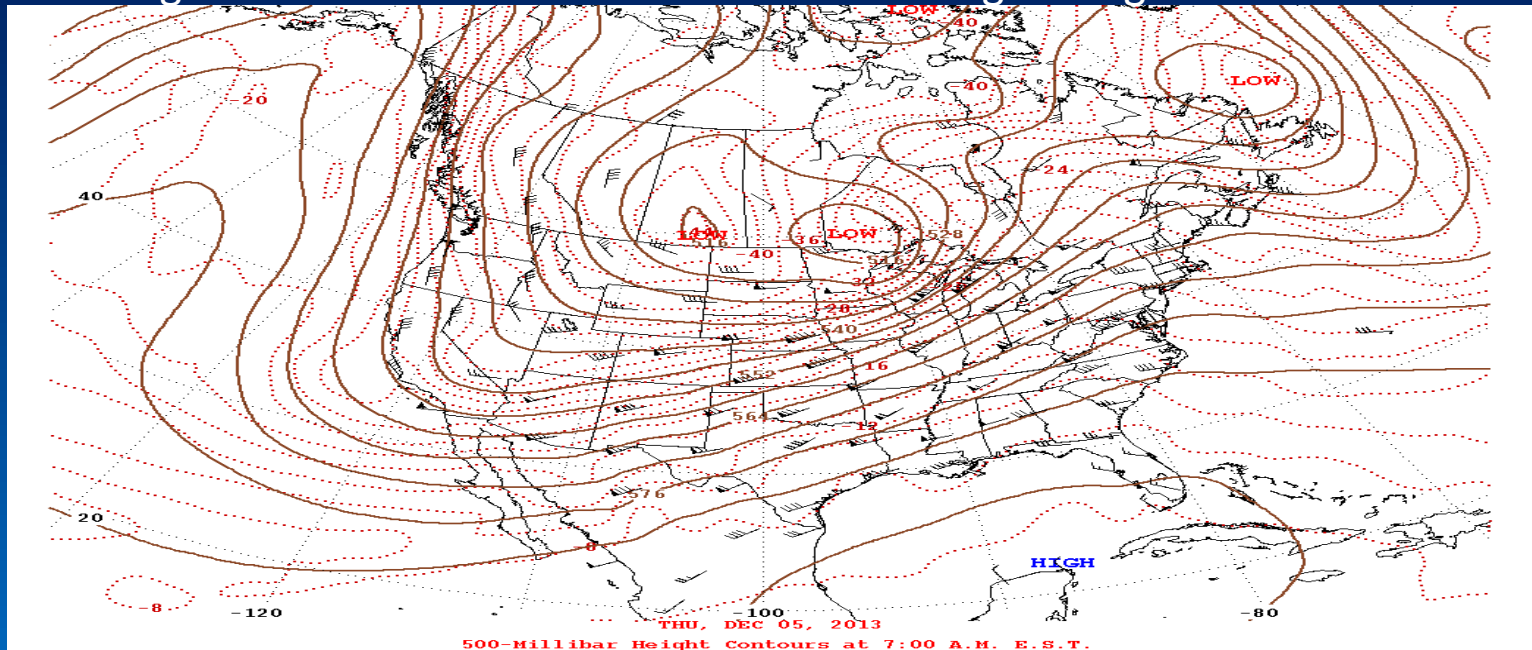


National Snowfall Analysis: 24-hour accumulation ending 2013-12-05 12 UTC

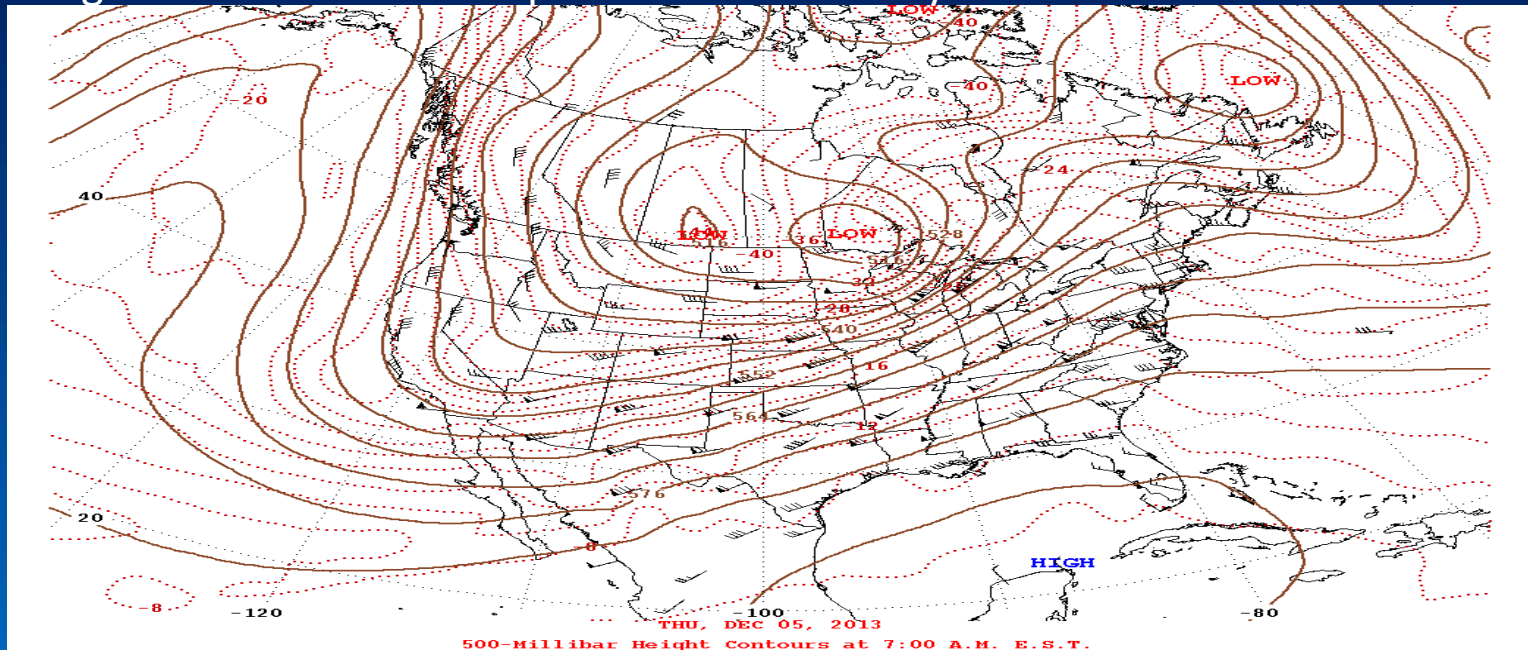
6054 reports; issued 2017-04-09 03:47:05 UTC



A main trough with several short wave features moving through

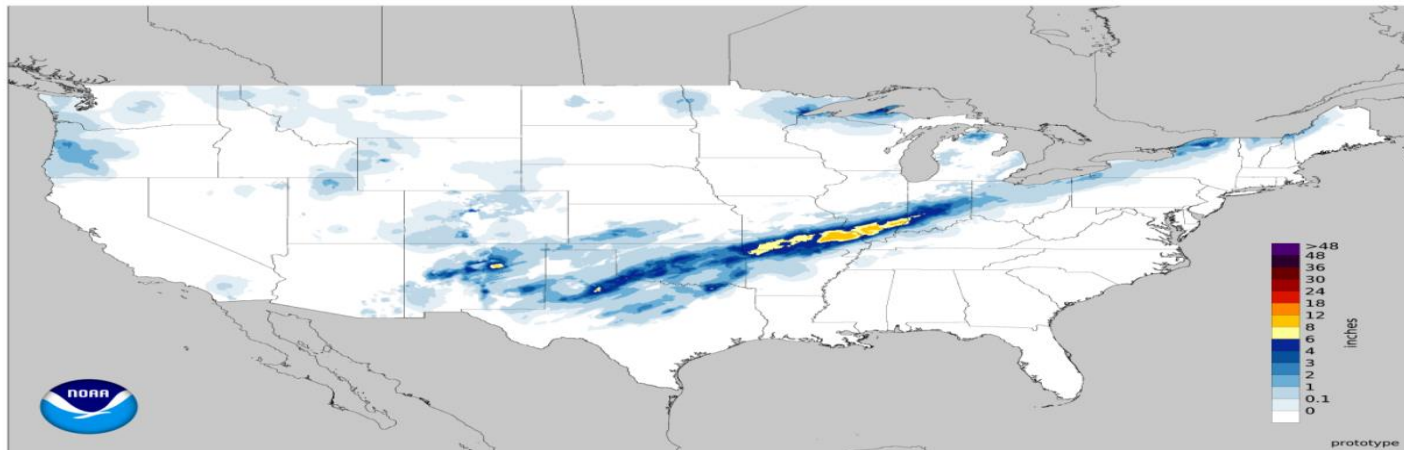


A trailing cold front was focus point for more wintry weather

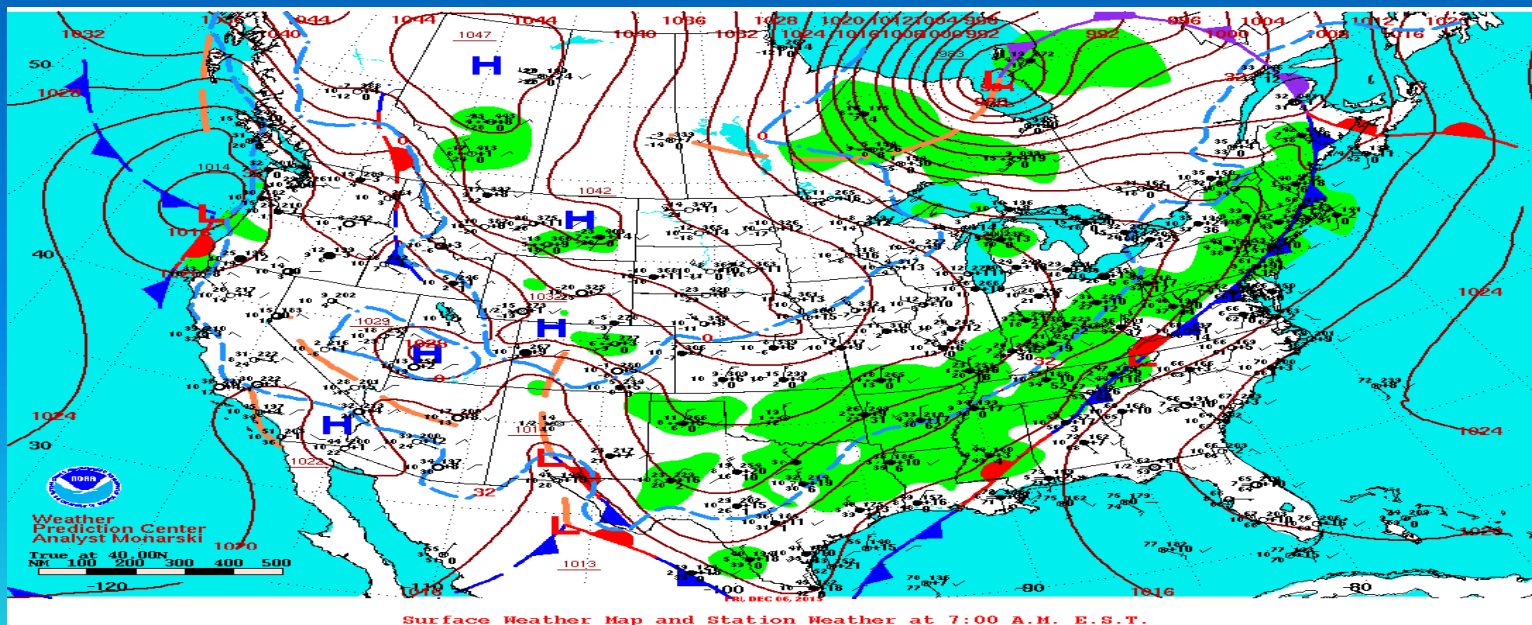
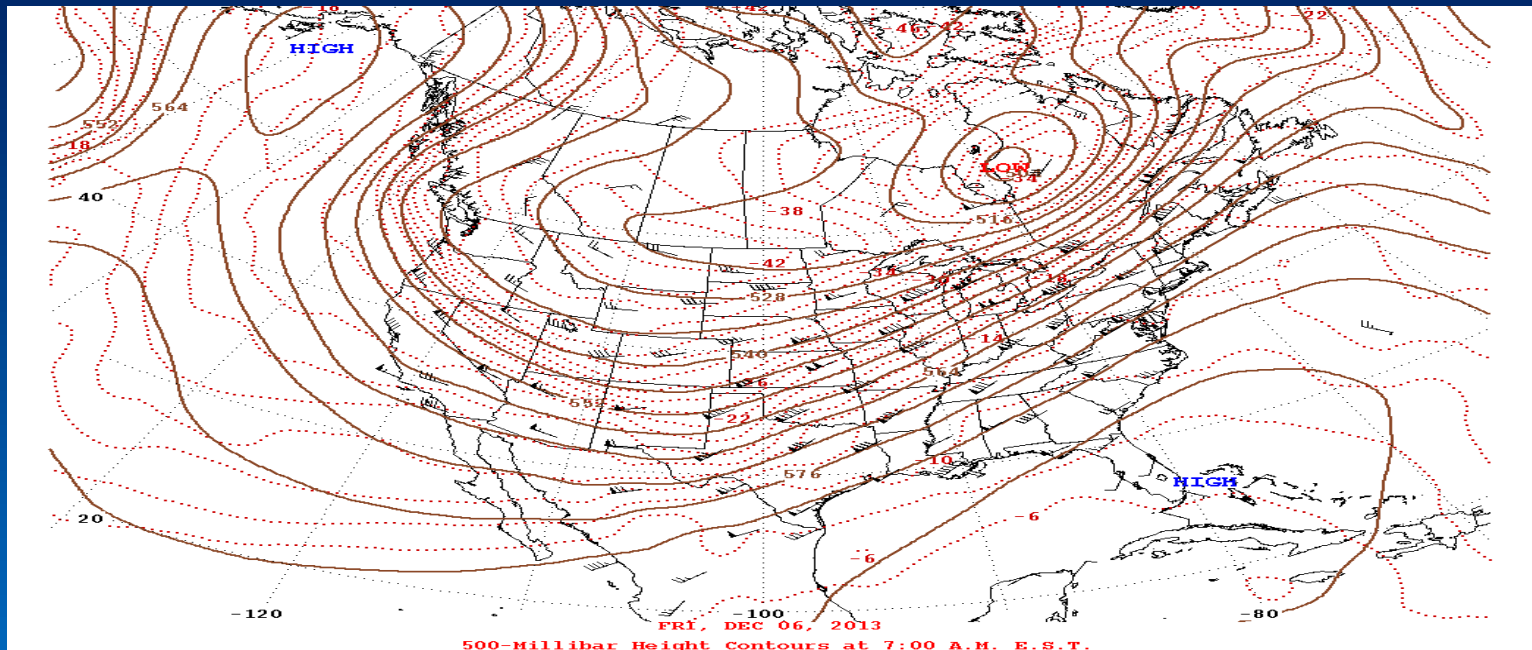


National Snowfall Analysis: 24-hour accumulation ending 2013-12-06 12 UTC

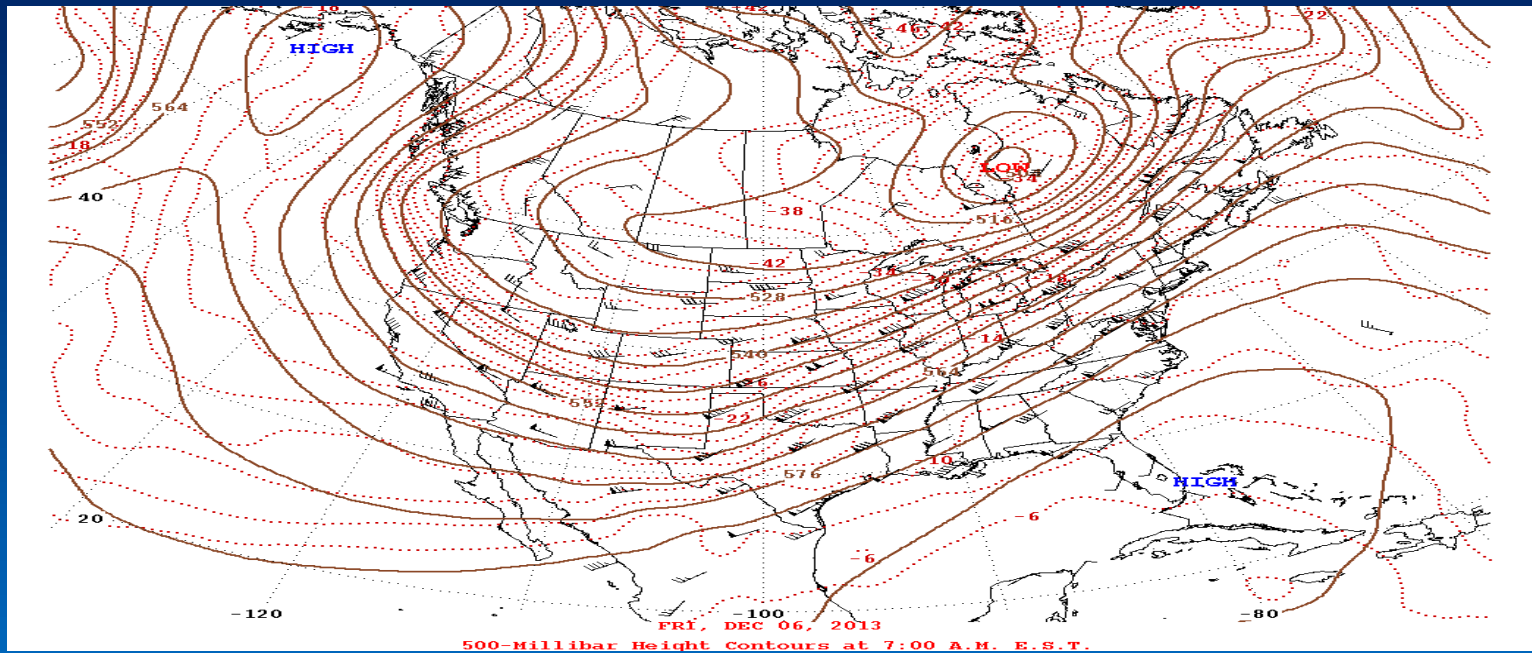
5645 reports; issued 2017-04-09 04:10:15 UTC



A trailing cold front was focus point for more wintry weather

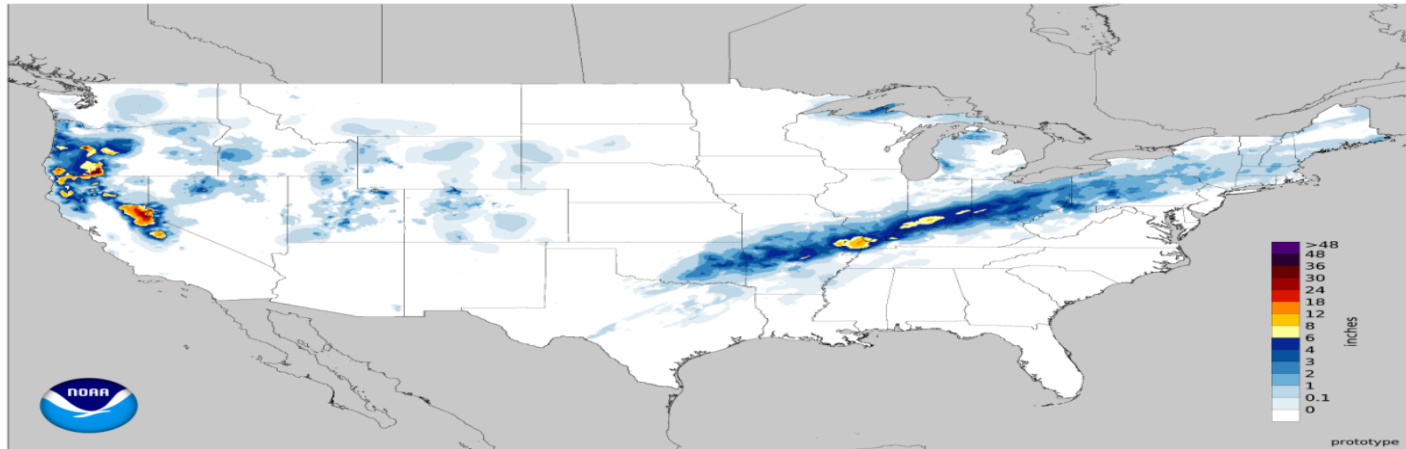


A trailing cold front was focus point for more wintry weather



National Snowfall Analysis: 24-hour accumulation ending 2013-12-07 12 UTC

5830 reports; issued 2017-04-09 04:26:29 UTC



Winter Storm Naming Process

- Committee of Three

- Tom Niziol

- Winter Weather Expert, The Weather Channel*

- Stu Ostro

- Senior Meteorologist, Sr. Director Weather Communications, The Weather Channel*

- Jon Erdman

- Senior Meteorologist, The Weather Company*

Full Control For Making The Decision Rests With The Meteorologists

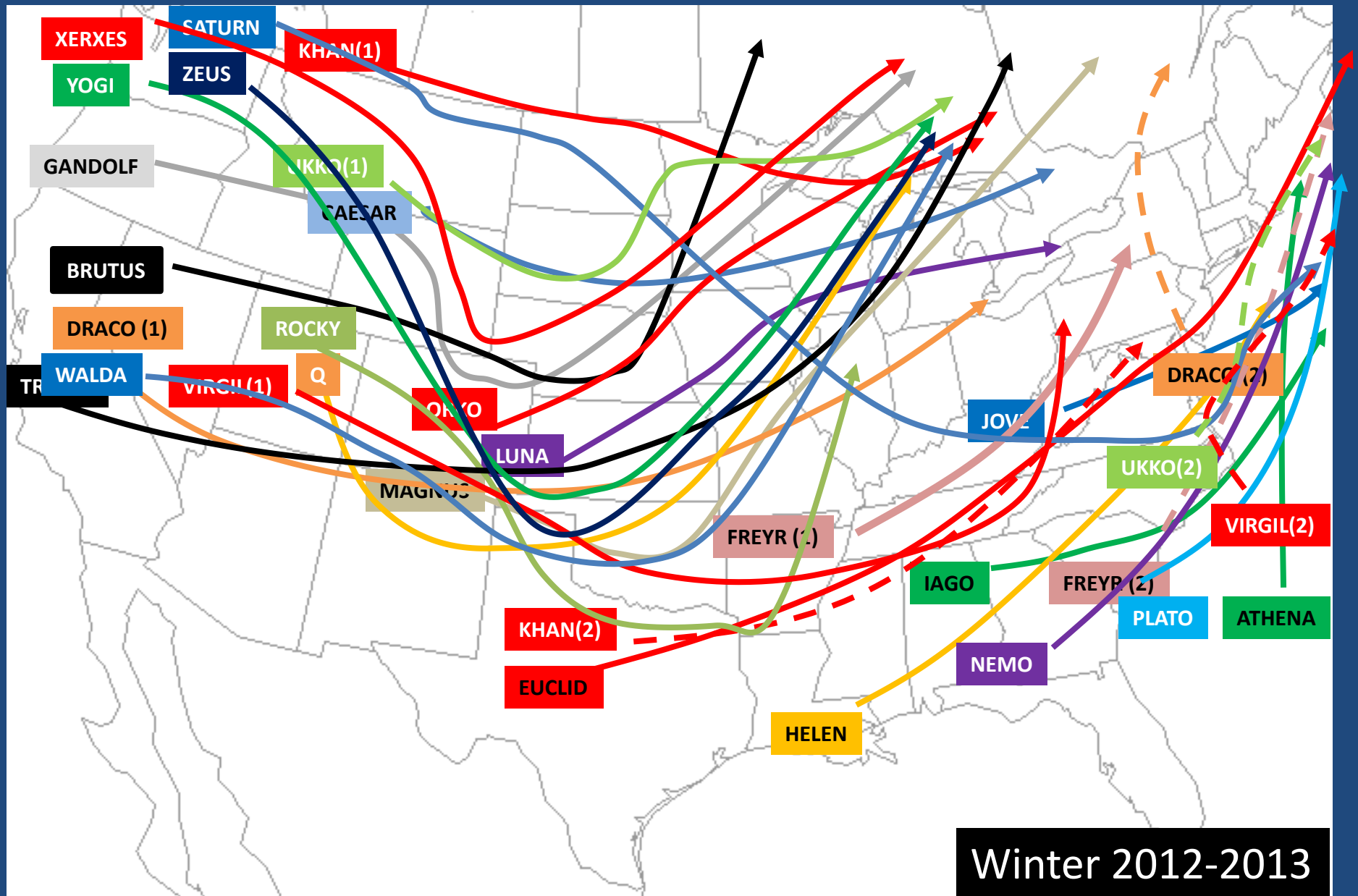
Summary – Quantitative Guidance

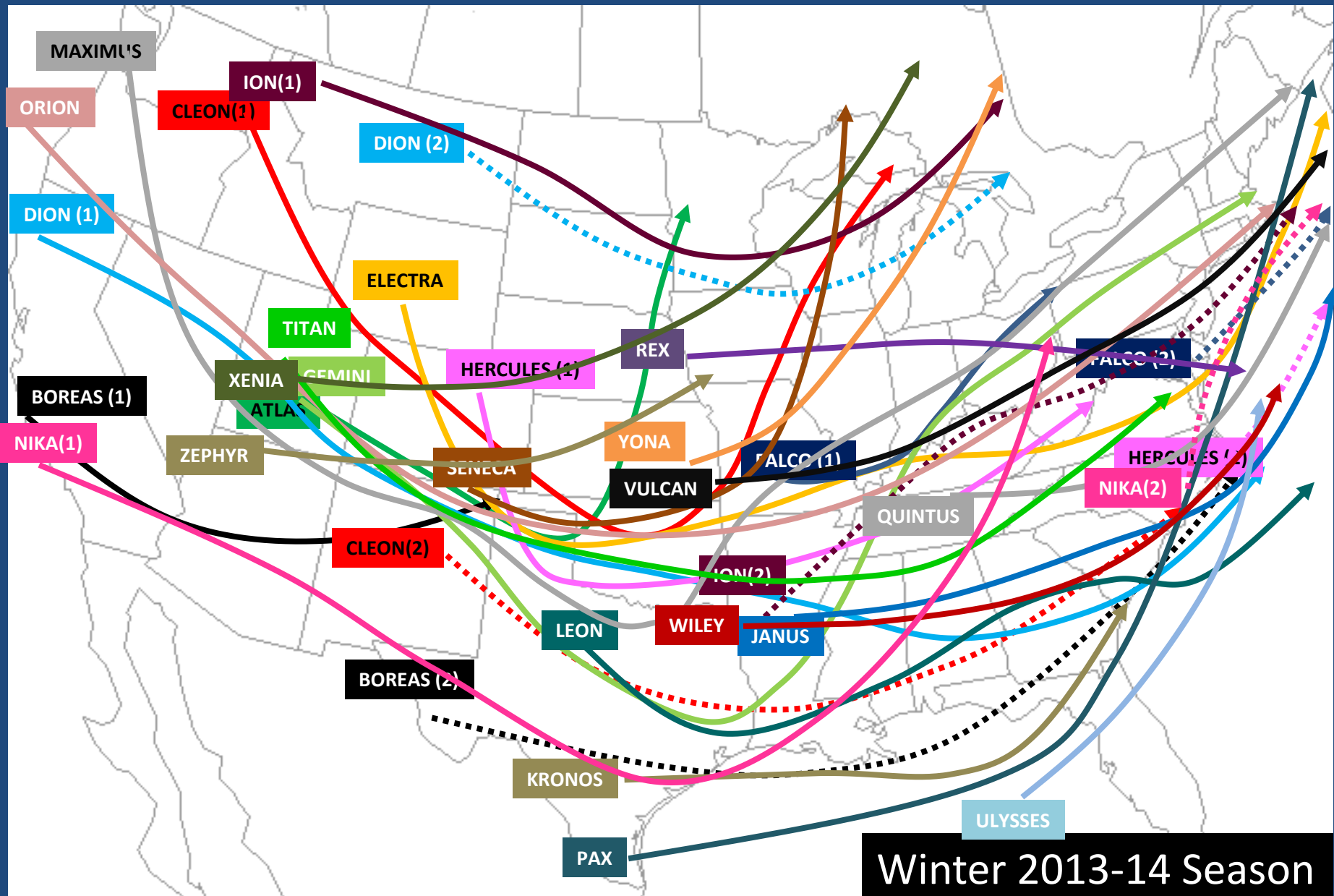
- Winter Storms are named based on a meteorological assessment of the upcoming weather pattern affecting the continental U.S.
- The naming process evaluates the population and area under or expected to go under NWS Winter Storm Warnings
- Once it is apparent those values will be reached the storm is named

Summary

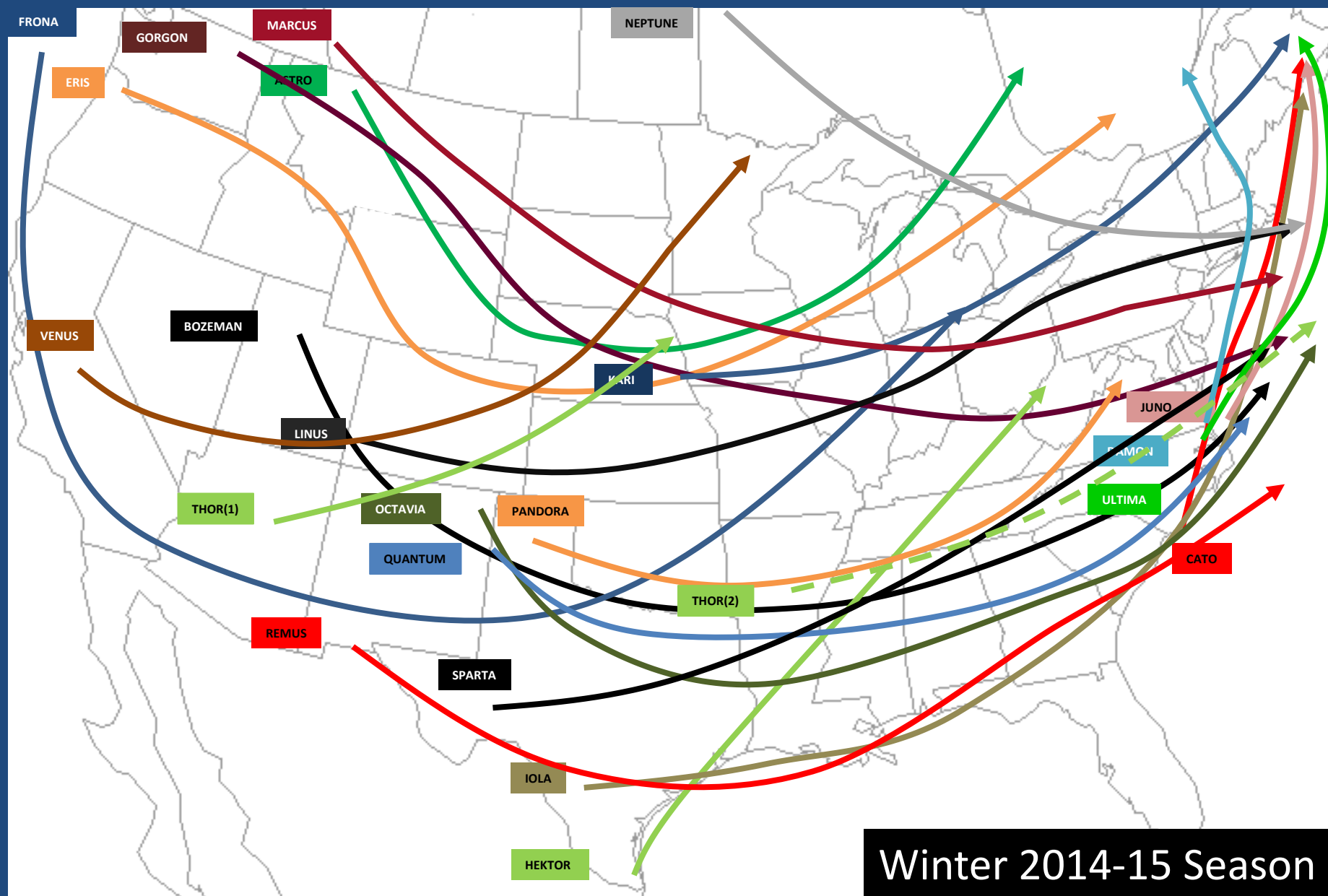
Questions That Still Need To Be Answered

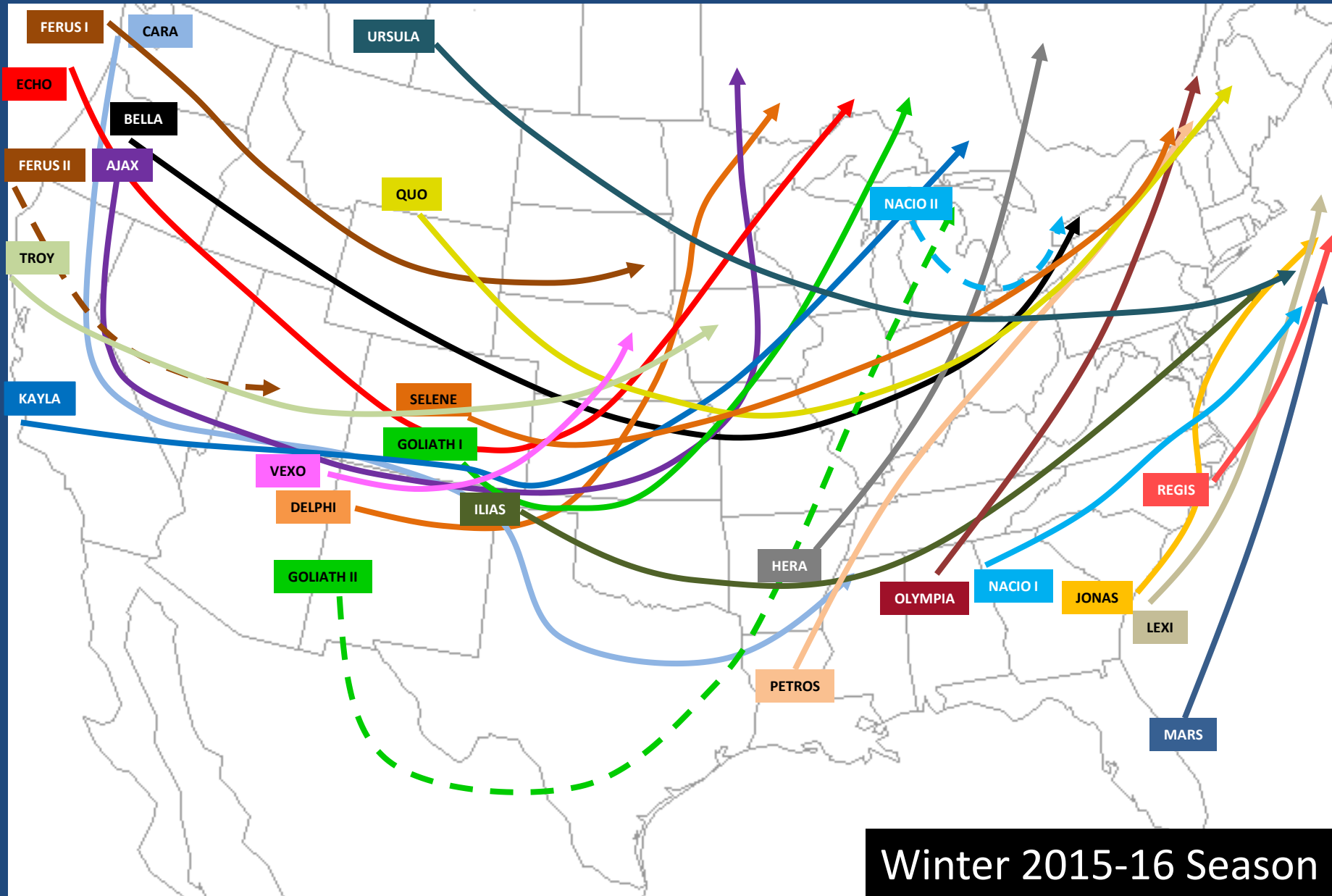
- Pacific Coast Storms that bring damaging winds and flooding rains.
- Major “small scale” lake-effect storms that impact relatively large populations.



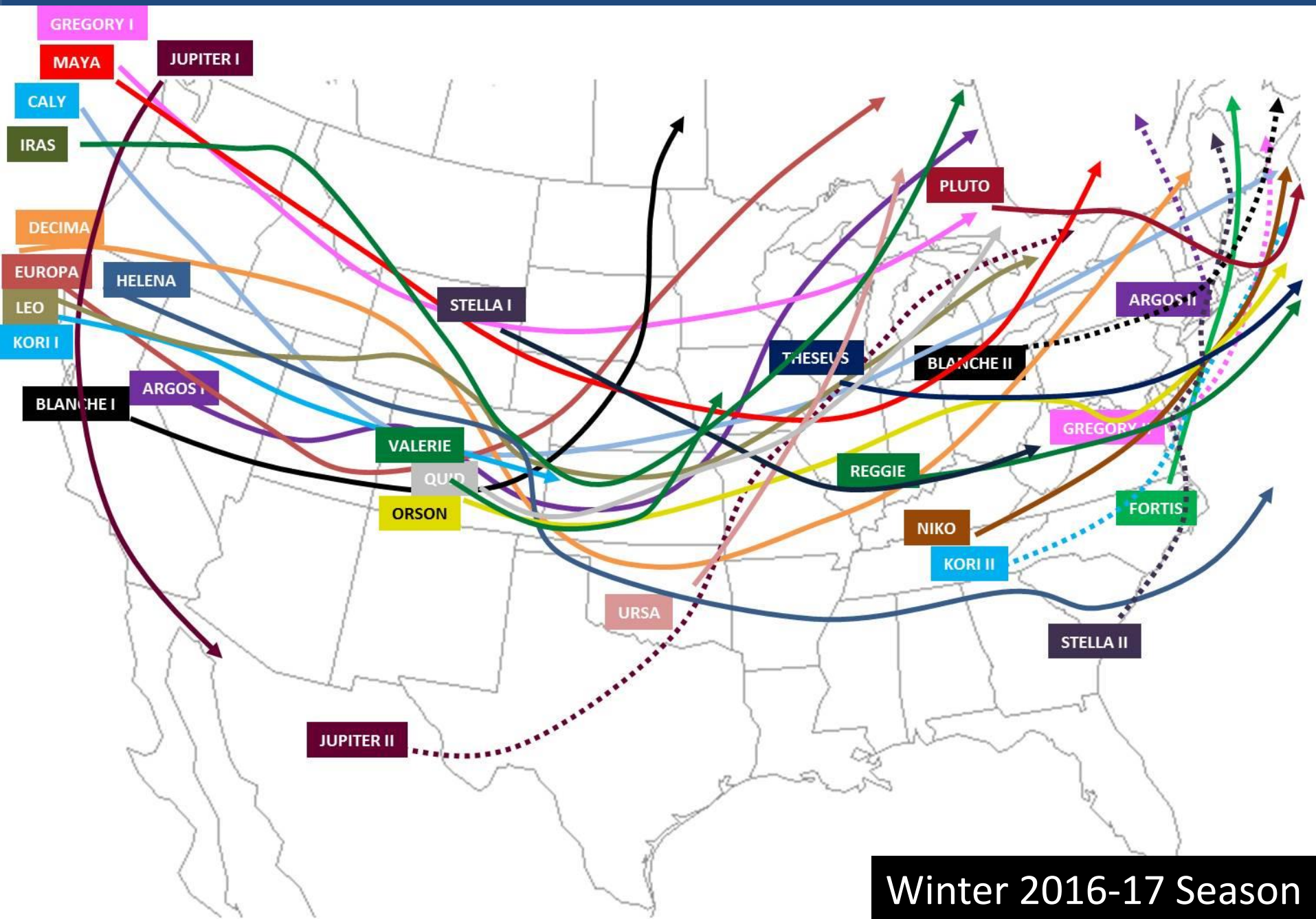


Winter 2013-14 Season

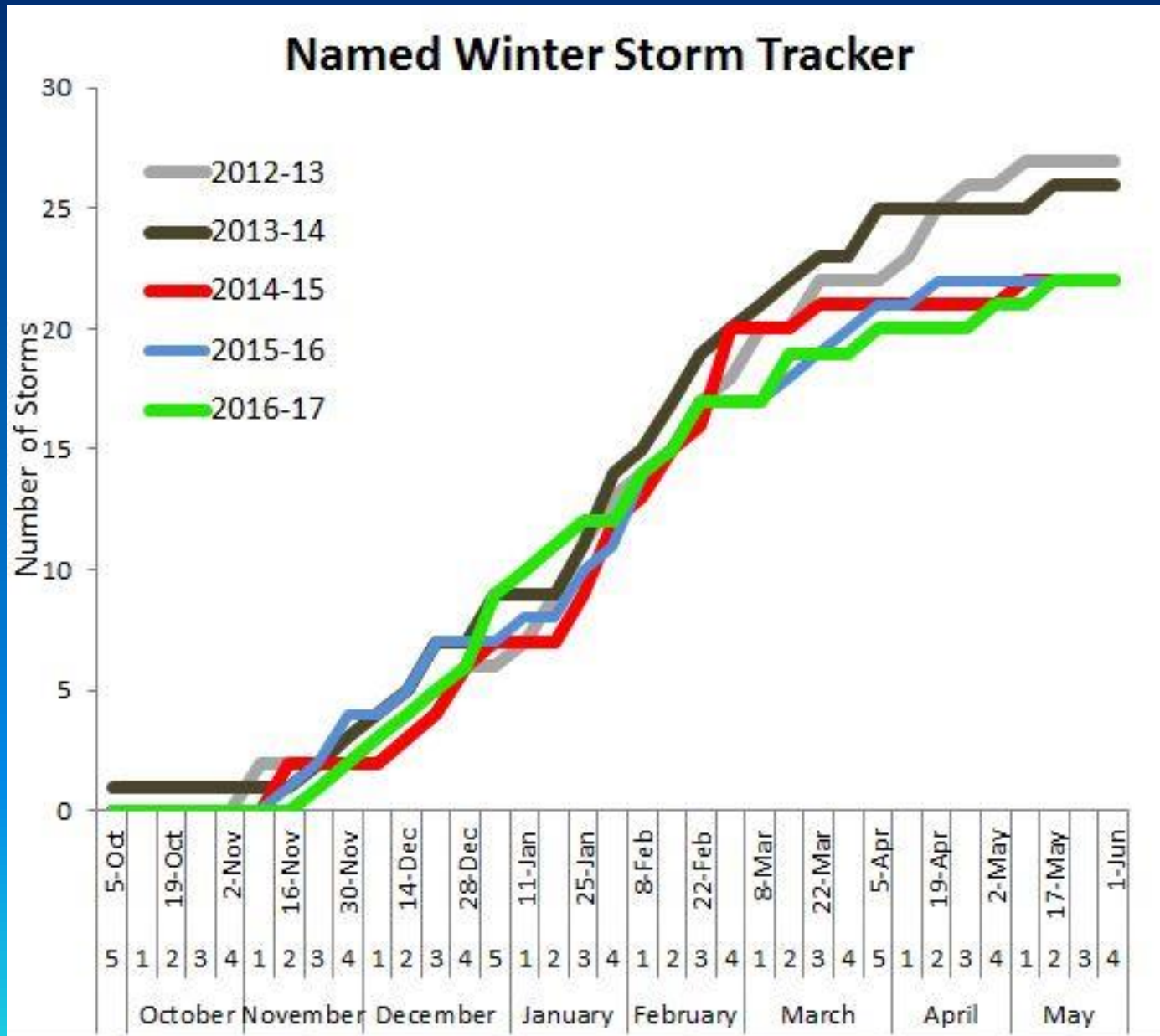




Winter 2015-16 Season



Storm Naming Date Comparison



Storm Naming Date Comparison

2012-13 Names		2013-14 Names		2014-15 Names		2015-16 Names		2016-17 Names	
Athena	11/6/2012	Atlas	10/3 - 10/5	Astro	11/9 - 11/12	Ajax	11/16 - 11/18	Argos	11/17-11/21
Brutus	11/8/2012	Boreas	11/22 - 11/27	Bozeman	11/13 - 11/17	Bella	11/19 - 11/22	Blanche	11/27 - 12/1
Caesar	12/8/2012	Cleon	12/1 - 12/7	Cato	11/25 - 11/26	Cara	11/24 - 11/29	Caly	12/7 - 12/12
Draco	12/17/2012	Dion	12/5 - 12/11	Damon	12/10 - 12/12	Delphi	11/29- 12/2	Decima	12/13 - 12/18
Euclid	12/23/2012	Electra	12/11 - 12/14	Eris	12/25 - 12/27	Echo	12/13 - 12/16	Europa	12/21 - 12/26
Freyr	12/28/2012	Falco	12/16 - 12/18	Frona	12/27 - 1/4	Ferus	12/20 - 12/23	Fortis	12/28 - 12/30
Gandolf	1/10/2013	Gemini	12/19 - 12/23	Gorgon	1/4 - 1/6	Goliath	12/23 - 12/29	Gregory	1/1 - 1/3
Helen	1/15/2013	Hercules	12/31 - 1/3	Hektor	1/9 - 1/12	Hera	1/9 - 1/10	Helena	1/3 - 1/7
Iago	1/17/2013	Ion	1/3 - 1/6	Iola	1/21 - 1/24	Ilias	1/19 - 1/20	Iras	1/6 - 1/10
Jove	1/21/2013	Janus	1/20 - 1/22	Juno	1/26 - 1/28	Jonas	1/20 - 1/24	Jupiter	1/11 - 1/19
Khan	1/25/2013	Kronos	1/23 - 1/24	Kari	1/29 - 2/1	Kayla	1/29 - 2/3	Kori	1/17 - 1/25
Luna	1/27/2013	Leon	1/27 - 1/29	Linus	1/30 - 2/2	Lexi	2/4 - 2/6	Leo	1/22 - 1/26
Magnus	1/29/2013	Maximus	1/29 - 2/3	Marcus	2/6 - 2/10	Mars	2/7 - 2/8	Maya	2/5 - 2/7
Nemo	2/8/2013	Nika	1/31 - 2/5	Neptune	2/14 - 2/15	Nacio	2/8 - 2/9	Niko	2/7 - 2/9
Orko	2/10/2013	Orion	2/6 - 2/10	Octavia	2/15 - 2/18	Olympia	2/14 - 2/16	Orson	2/10 - 2/13
Plato	2/18/2013	Pax	2/9 - 2/14	Pandora	2/19 - 2/21	Petros	2/23 - 2/25	Pluto	2/15 - 2/16
Q	2/19/2013	Quintus	2/14 - 2/16	Quantum	2/21 - 2/24	Quo	2/29 - 3/2	Quid	2/22 - 2/24
Rocky	2/24/2013	Rex	2/16 - 2/19	Remus	2/24 - 2/26	Regis	3/18 - 3/21	Reggie	3/9 - 3/10
Saturn	3/3/2013	Seneca	2/19 - 2/21	Sparta	2/27 - 3/1	Selene	3/21 - 3/25	Stella	3/11 - 3/15
Triton	3/8/2013	Titan	2/27 - 3/3	Thor	2/28 - 3/5	Troy	3/28 - 3/31	Theseus	3/31-4/2
Ukko	3/17/2013	Ulysses	3/5 - 3/6	Ultima	3/19 - 3/21	Ursula	4/4 - 4/5	Ursa	4/29 - 5/2
Virgil	3/22/2013	Vulcan	3/9 - 3/13	Venus	5/9 - 5/11	Vexo	4/15 - 4/18	Valerie	5/18 - 5/19
Walda	4/7/2013	Wiley	3/16 - 3/18						
Xerxes	4/13/2013	Xenia	3/30 - 4/1						
Yogi	4/15/2013	Yona	4/2 - 4/4						
Zeus	4/22/2013	Zephyr	5/10 - 5/13						
Achilles	5/3/2013								

	1/19	1/20	1/21	1/22	1/23	1/24	1/25	1/26
Jove 2013								
Janus 2014								
Juno 2015								
Jonas 2016								
Jupiter 2017								

Questions ??

How Are Winter Storms Different From Hurricanes

- Hurricanes are named from a meteorological standpoint
 - Winds greater than 74mph.
 - The damage threat to a location is **independent of latitude**.
 - Hurricanes are named **regardless of the potential to impact people**.
- Winter storms are named by The Weather Channel based on impact
 - What **combination of winter weather elements** will impact* people.
 - On a national scale, how many people and how big an area will be impacted.
- * Impact is a tough parameter to define.
 - Broadly stated, winter weather will typically affect travel.
 - Impacts become critical when school and businesses close.
 - Impacts become critical when major highways shut down.
 - Impacts become critical when major transportation hubs (airports shut down)

TWC Development of Naming Quantitative Approach

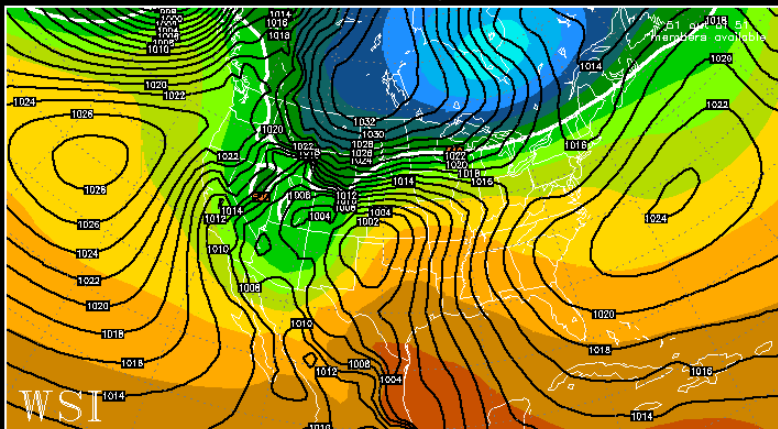
- 2012-13 Season **27 storms** were named.
- However we did not use a quantitative method to name.
- Upon review of the storms we felt that there were only **one or two** that did not achieve a “large scale” impact.
- So, we went back and calculated the approximate **AREA** and **POPULATION** that were under NWS Winter Storm Warnings for each storm.
- We plotted each storm against those numbers:
 - Population on X-axis
 - Areal coverage on Y-axis

Winter Storm Naming Process

- Systems Identified Days in Advance
 - Model to Model Comparisons
 - Dprog/dt

ECMWF Ensemble

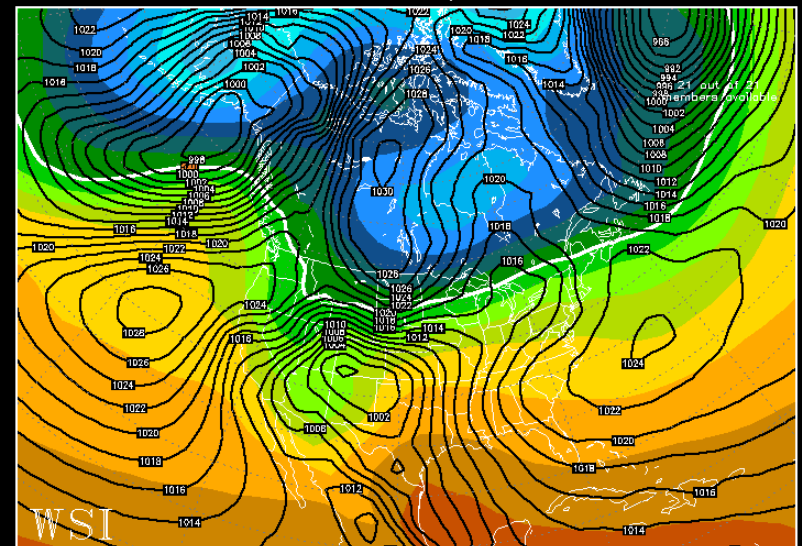
Mean 1000–500 mb Thickness/MSLP, 120 hr forecast



Initialized: 12Z Thu 04 Apr 2013 Valid: 12Z Tue 09 Apr 2013 (120 hr)



GFS Ensemble
Mean 1000–500 mb Thickness/MSLP, 120 hr forecast



Initialized: 12Z Thu 04 Apr 2013 Valid: 12Z Tue 09 Apr 2013 (120 hr)



Winter Storm Naming Process

- System Evolution Discussed at Morning Map Briefings



Winter Storm Naming Process

- Synopsis Conveyed To TWC Staff

Naming Outlook:

This outlook is to be used only for planning purposes associated with the naming aspect of winter storms.

Time Frame: Wednesday night through Monday

Location: Pac Northwest through Denver, Central Plains, Midwest, Central Appalachians through Virginia to Mid-Atlantic coast.

Impacts: Snow, also potential icing event to the lee of the Appalachians with a cold air damming event Sunday through Monday.

Chances to Name: MEDIUM to HIGH

Time Frame For Possible Naming: Monday Night Into Wednesday

Winter Storm Naming Process

- As Confidence for a High Impact Event Increases
- Conference Call May Be Scheduled by Committee
- If confidence is high enough that the criteria will eventually be met, storm can be named ahead of NWS Winter Storm Warning Issuances.

Winter Storm Naming Process

- Once a Decision Is Made To Name
 - Programming is notified to coordinate release
 - TWC Divisions Are Notified by An Email
 - Television Team
 - Web Team (weather.com)
 - Radio
 - Other Company Divisions (Wunderground etc.)
 - Satellite Offices (New York, Chicago, San Francisco)
 - Administrative and Management

Winter Storm Naming Process

For immediate release

The Winter Storm Team has named the upcoming winter storm **SATURN** based on the following:

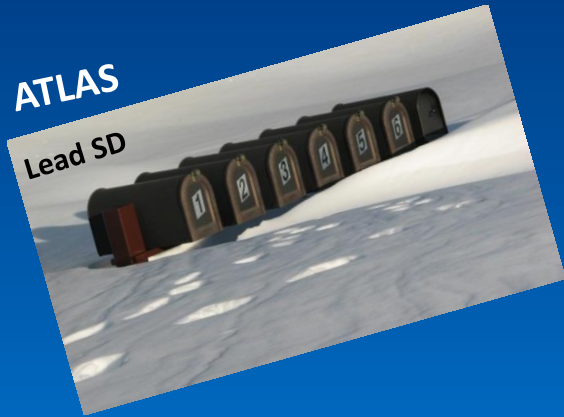
- **Time Frame** – Sunday through Thursday
- **Location** – Sunday through Tuesday – Northern Plains through Upper Midwest.
Tuesday through Thursday – Ohio Valley through Mid-Atlantic.
- **Impacts** – Snow from Northern Plains through Ohio Valley. Snow/wind for Mid-Atlantic .
Strong winds/coastal flooding likely Mid-Atlantic Coast to Long Island.
- **Other Information** – Once the storm rapidly strengthens along the Mid-Atlantic coast midweek, it will also slow down. This will result in an extended period of high impacts for parts of Mid-Atlantic including heavy snowfall and significant coastal flooding and erosion from strong onshore winds. The strong winds along with heavy, wet snow will lead to widespread power outages for a large area. We are still four days out from the rapid strengthening of the storm off the Mid-Atlantic coast, so slight changes in storm track and timing could mean significant adjustments to the areas impacted by the storm.

This product will be updated as necessary. Please refer to [weather.com](https://www.weather.com) for additional details.

What Will This Season Bring ??

ATLAS

Lead SD



HERCULES



New York Area

LEON



REX



East York PA

ORION



Portland, OR

ULYSSES

High Point, NC

