The Jet Stream: The Atmosphere's Interstate Highway

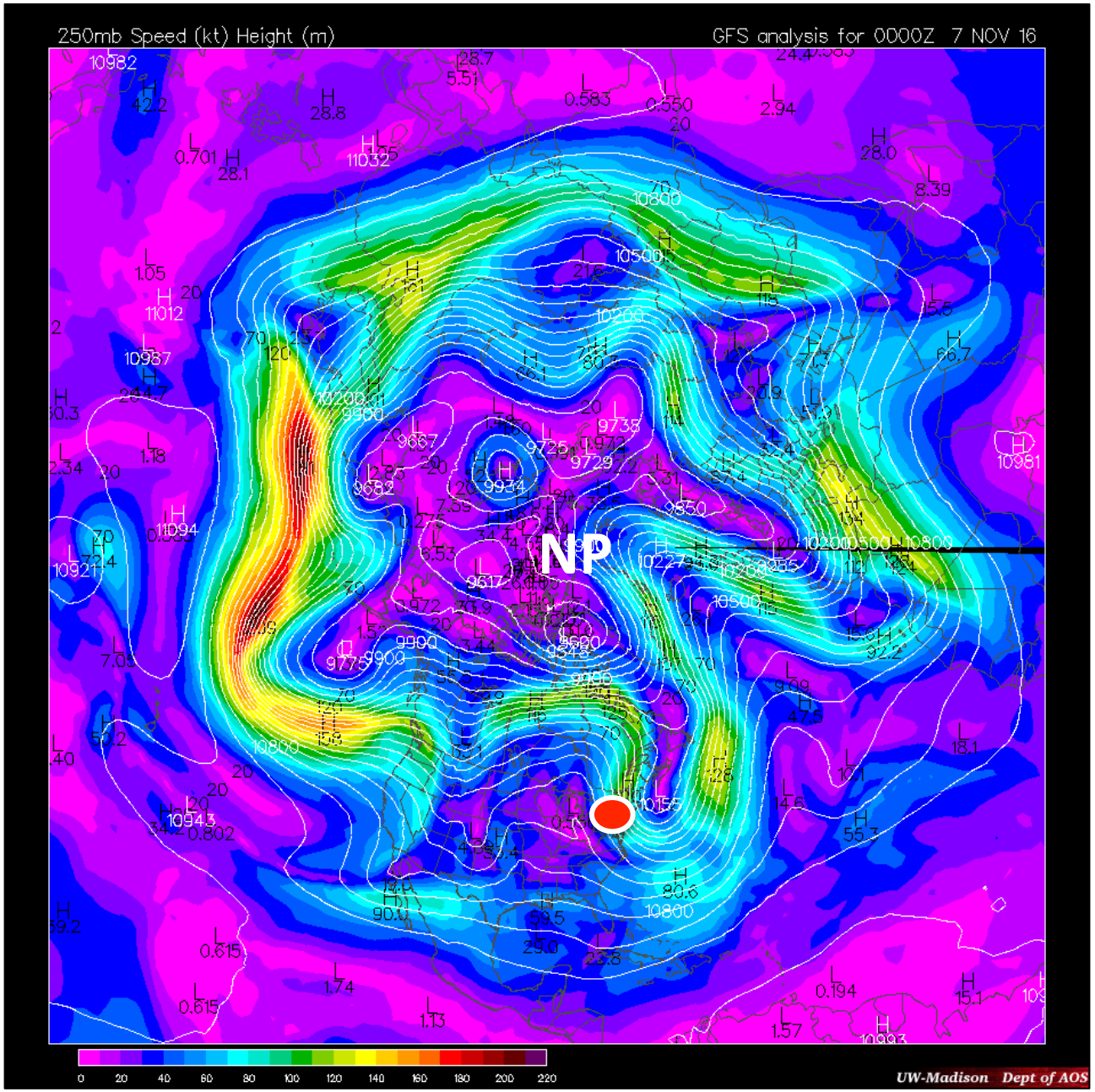
Andrew C. Winters

ATM 110

10 November 2016

Wind speed ~10 km above Earth's surface

7pm EST Nov. 6, 2016



Albany, NY

NP North Pole

UW-Madison AOS

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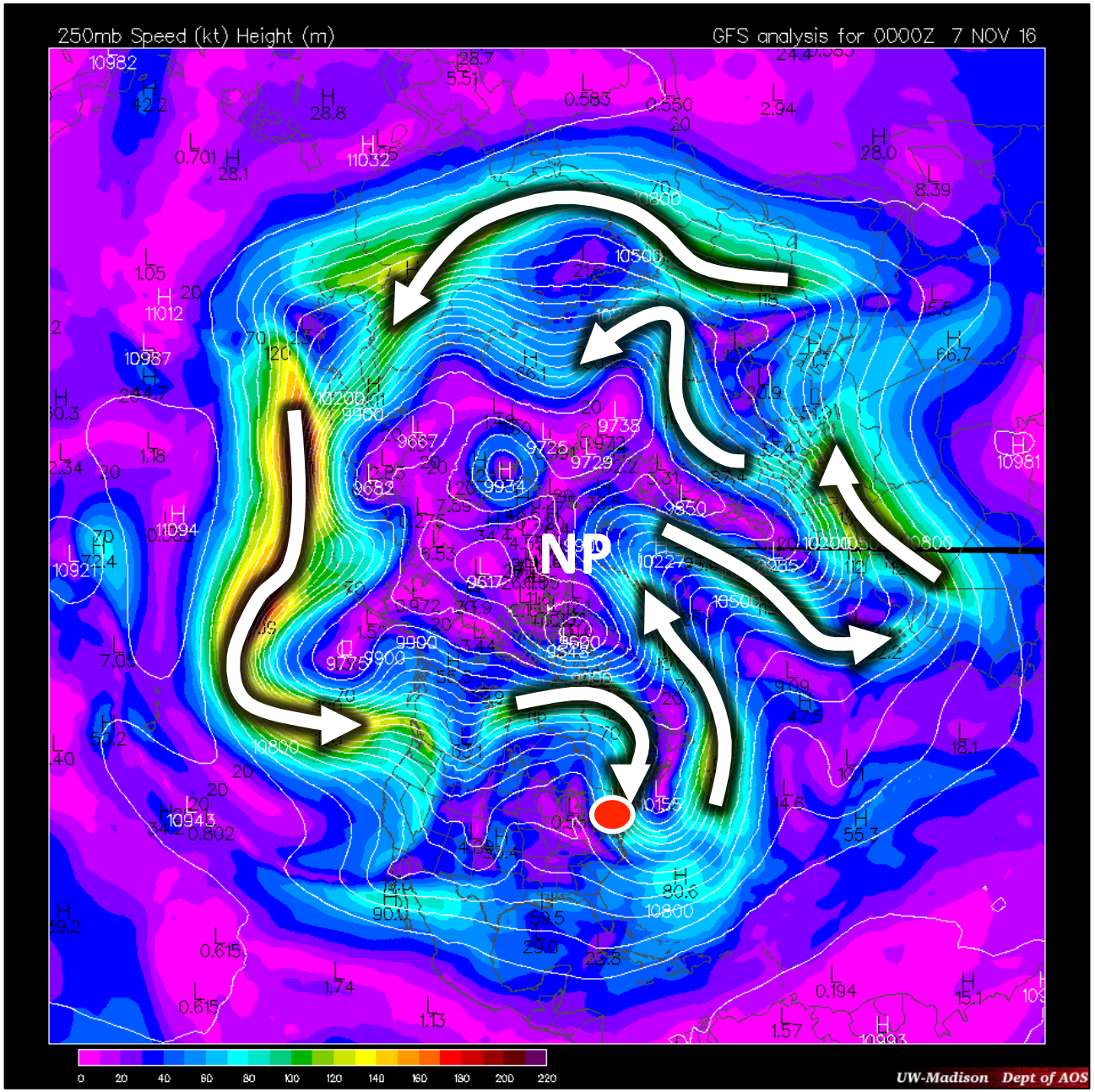


Jet Streams

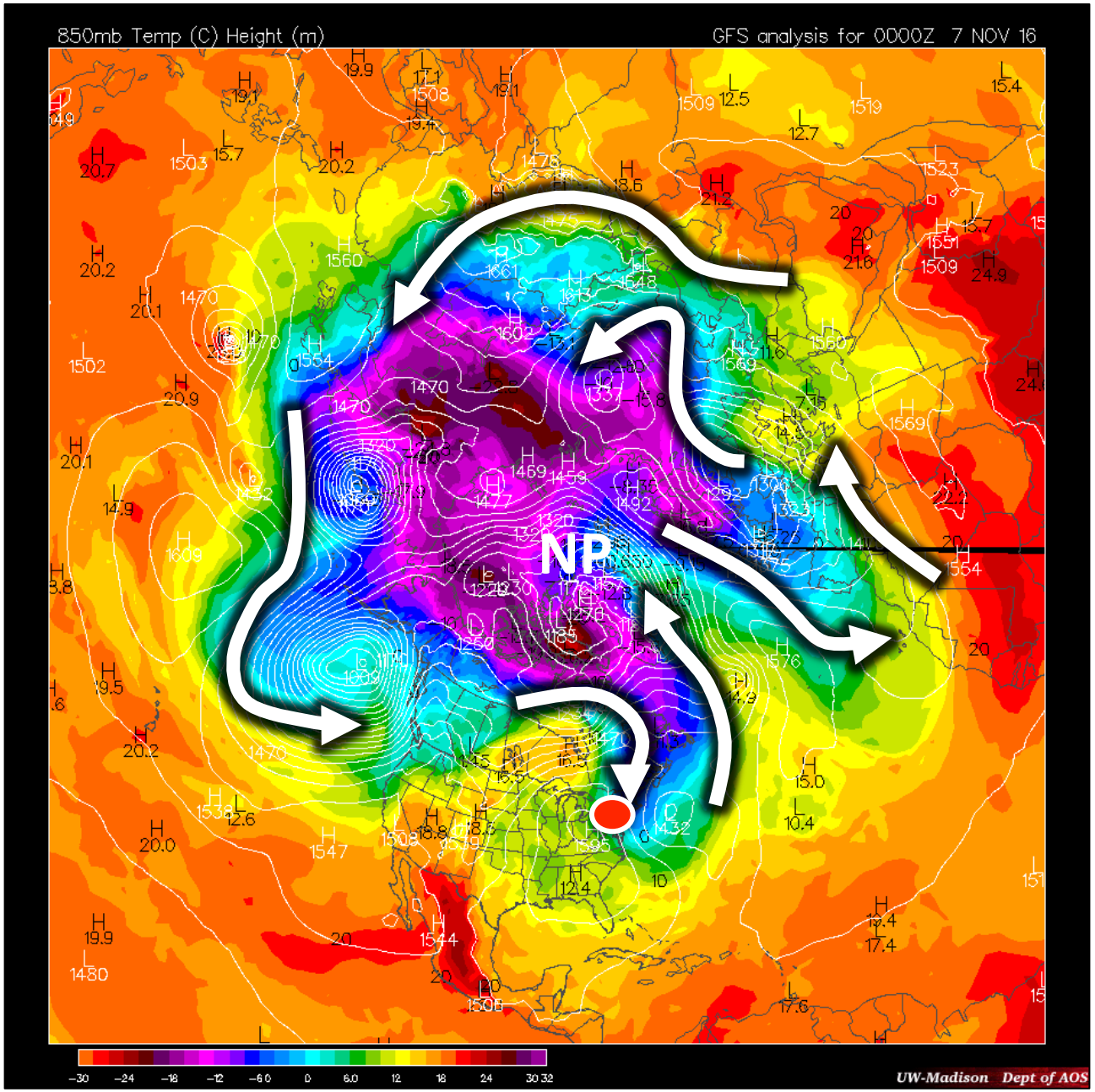
Albany, NY

NP North Pole

UW-Madison AOS

Temperature ~1 km above Earth's surface

7pm EST Nov. 6, 2016



Jet Streams

Albany, NY

NP North Pole

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Building Blocks to Jet Stream "Discovery"

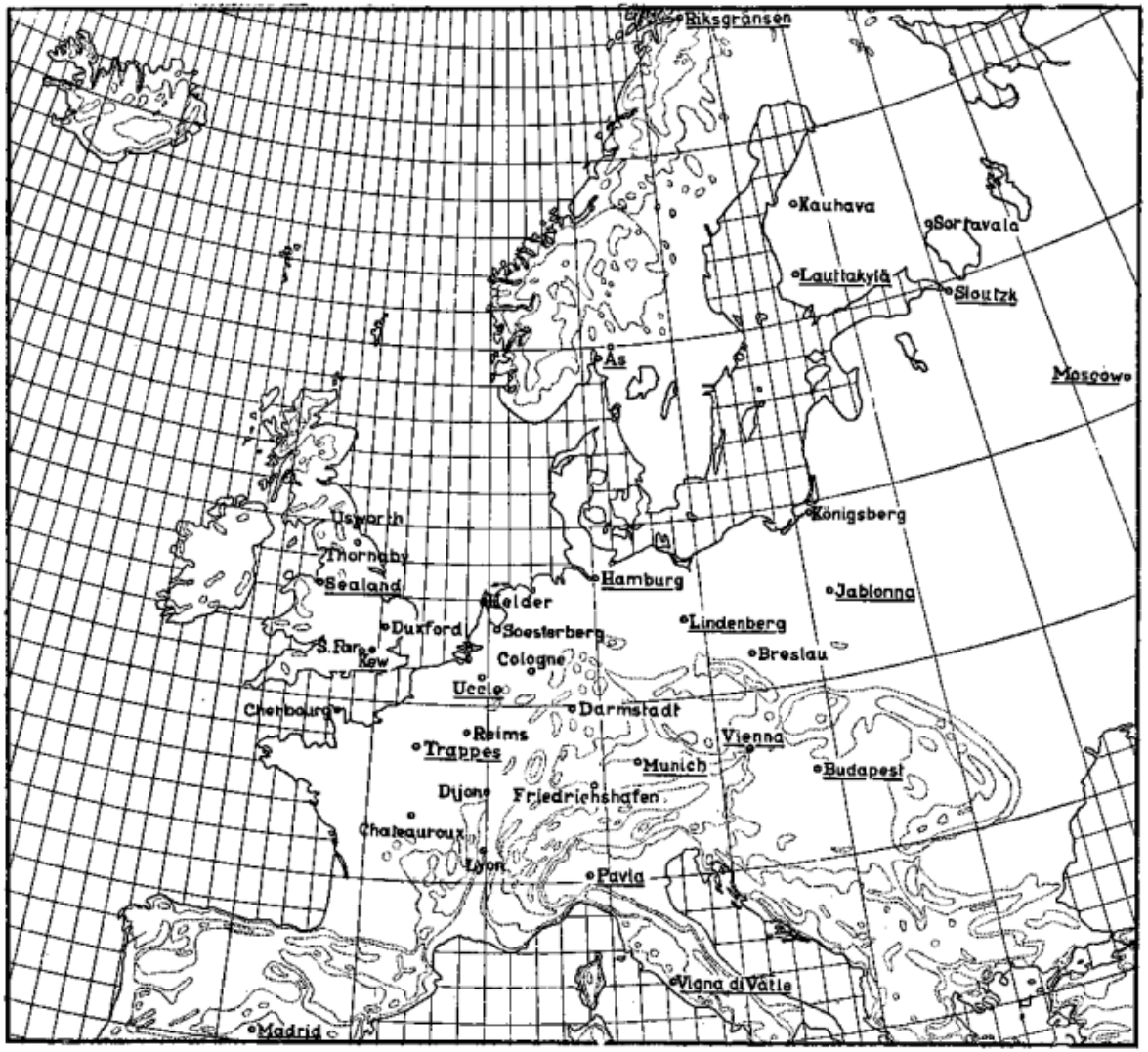
Teisserenc de Bort (1902)

Discovery of the stratosphere

Temperature stops decreasing when you get far enough away from the Earth's surface

Building Blocks to Jet Stream "Discovery"

Bjerknes and Palmén (1937)



Coordinated **"swarm ascents"** at 18 different locations across Europe.

“Discovery” of the Jet Stream

Reid Bryson and Bill Plumley – Weather Officers in the Pacific during World War II (1944) (Bryson 1994).

CCR

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Cliff Mass

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MIT

Carl-Gustaf Rossby – First to refer to the phenomenon as the “jet stream” (1947).

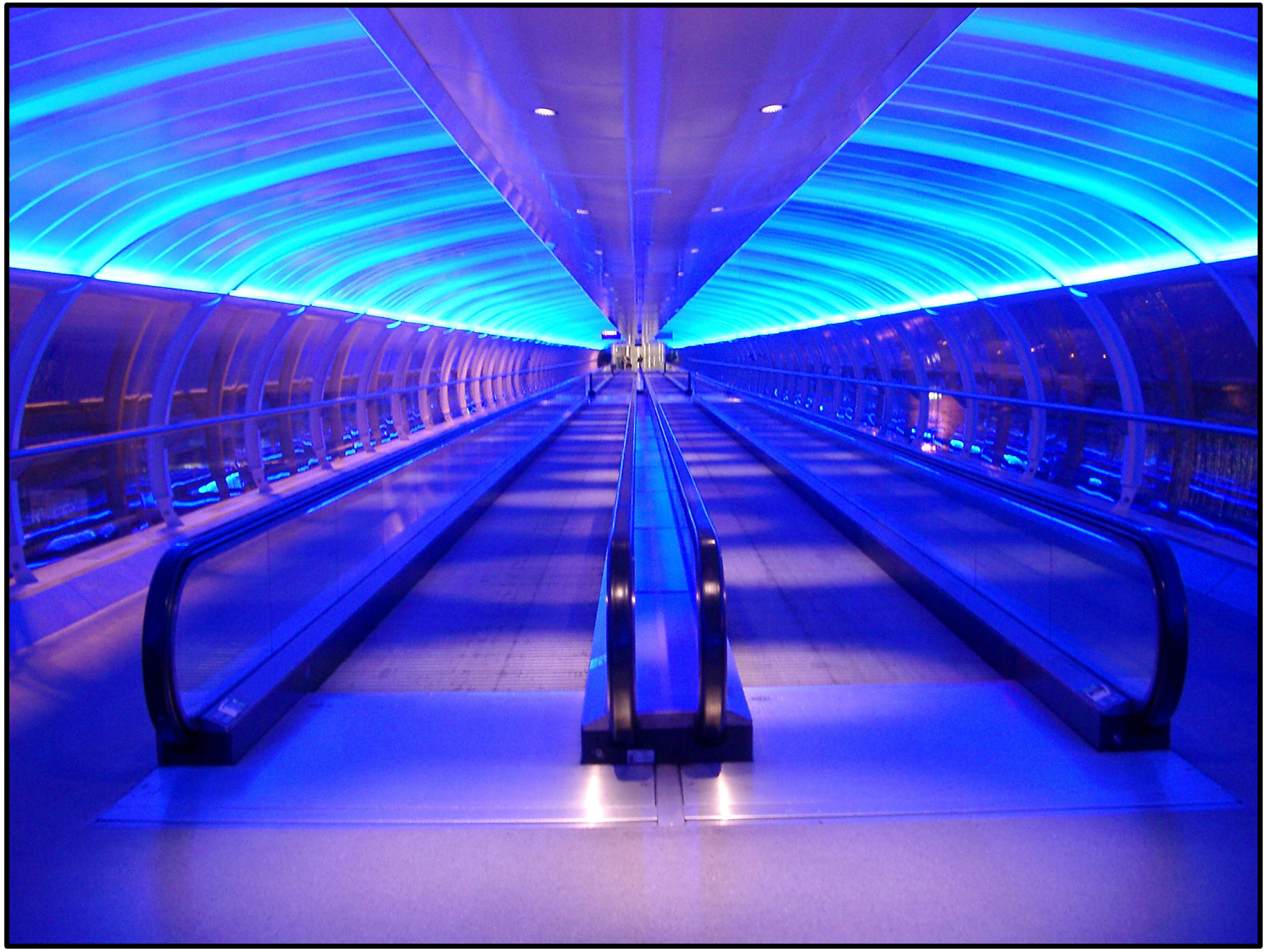
Characteristics of the Jet Stream

1) A nearly continuous band of strong wind speed that encircles the globe.

2) Located at the transition zone between the troposphere and stratosphere.

3) Sits above the location of cold and warm fronts at the surface.

How do Jet Streams Impact the Weather?



Photoeverywhere.co.uk

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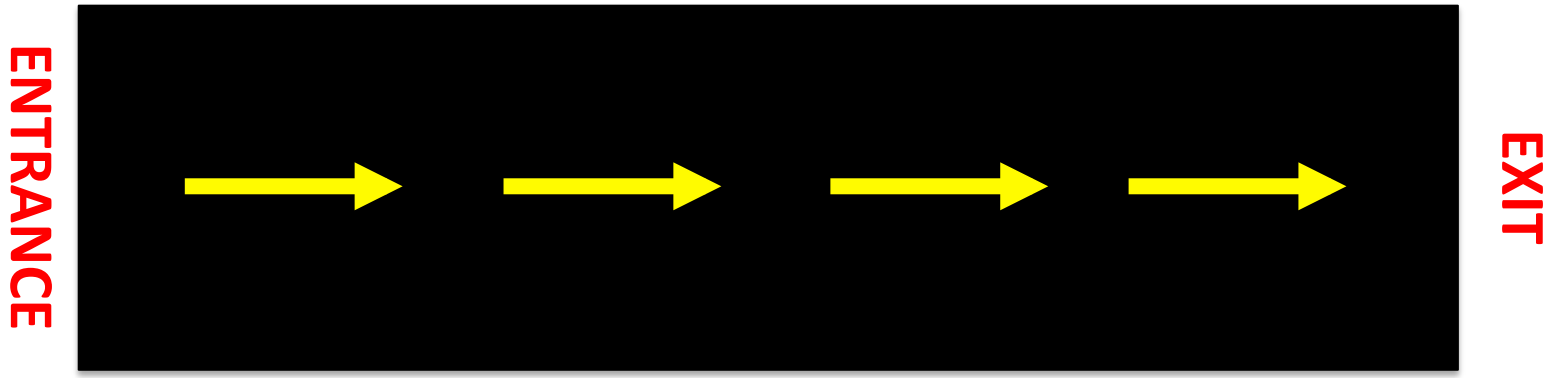

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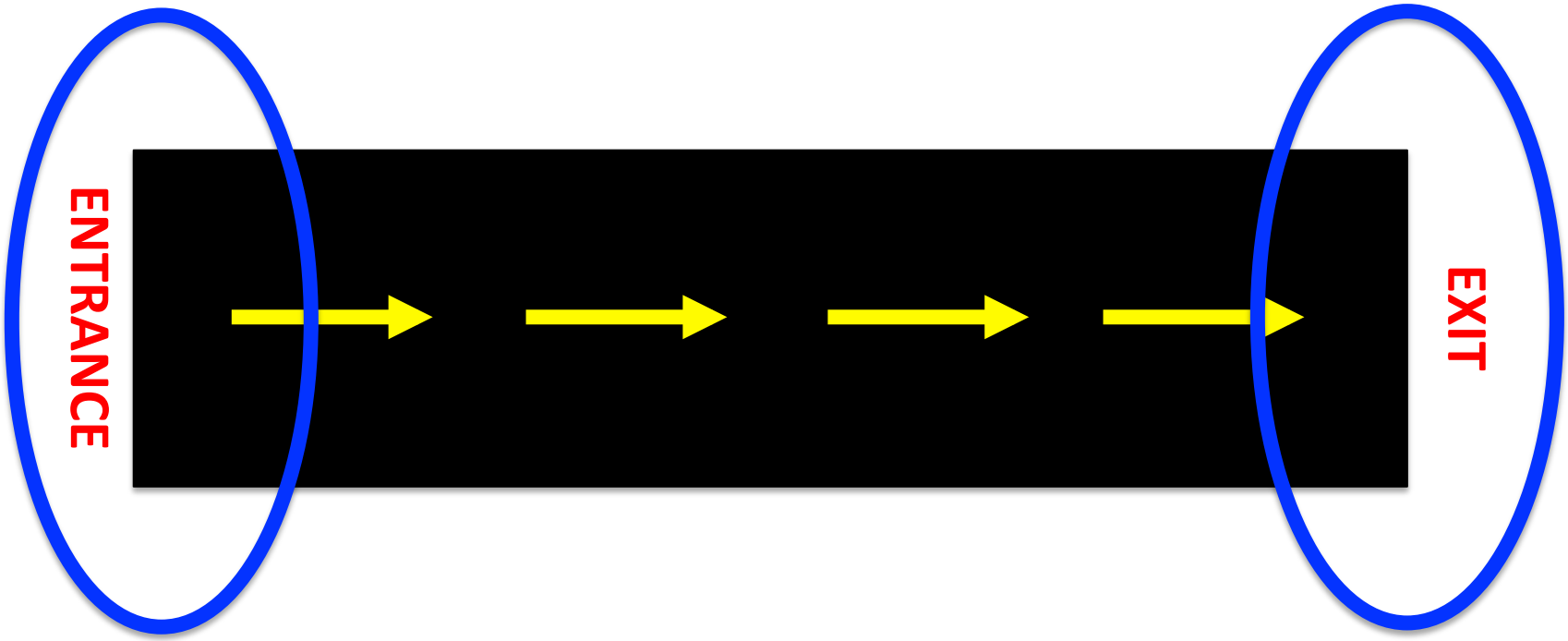

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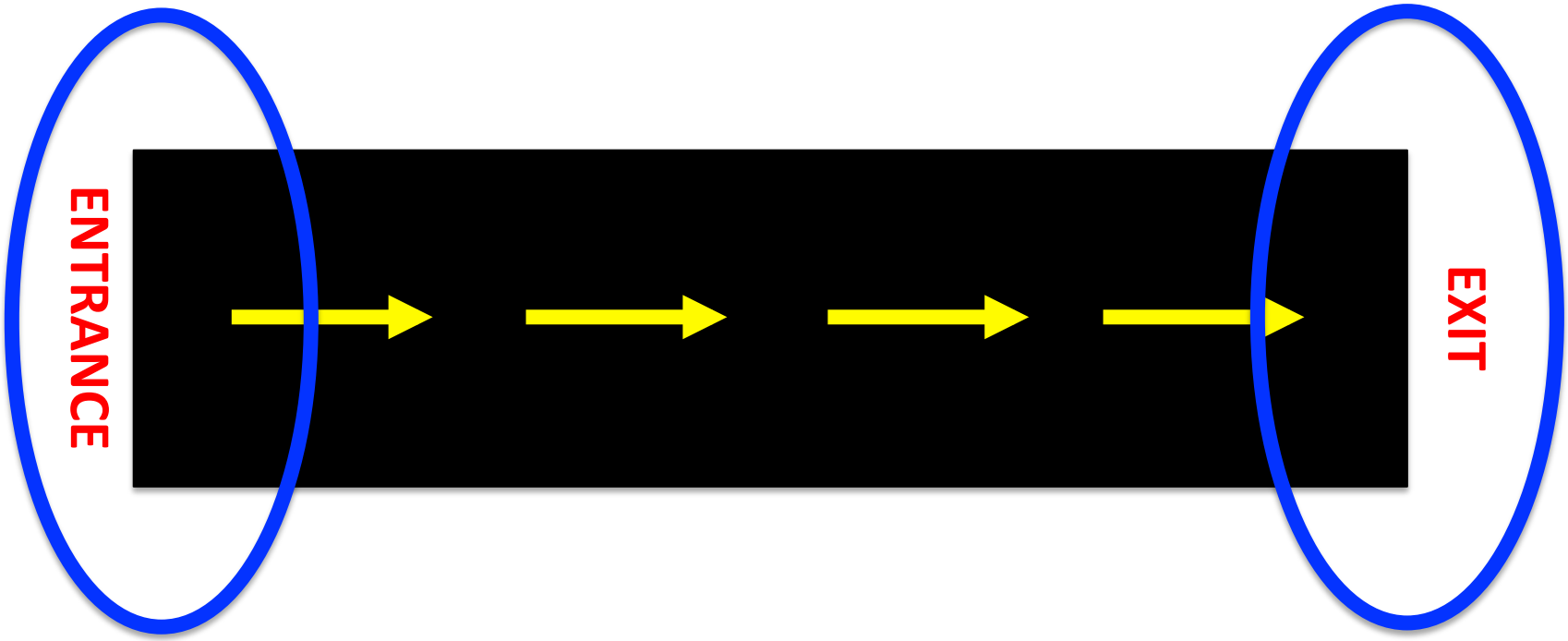

Areas where there is an acceleration or deceleration are important for generating clumsiness

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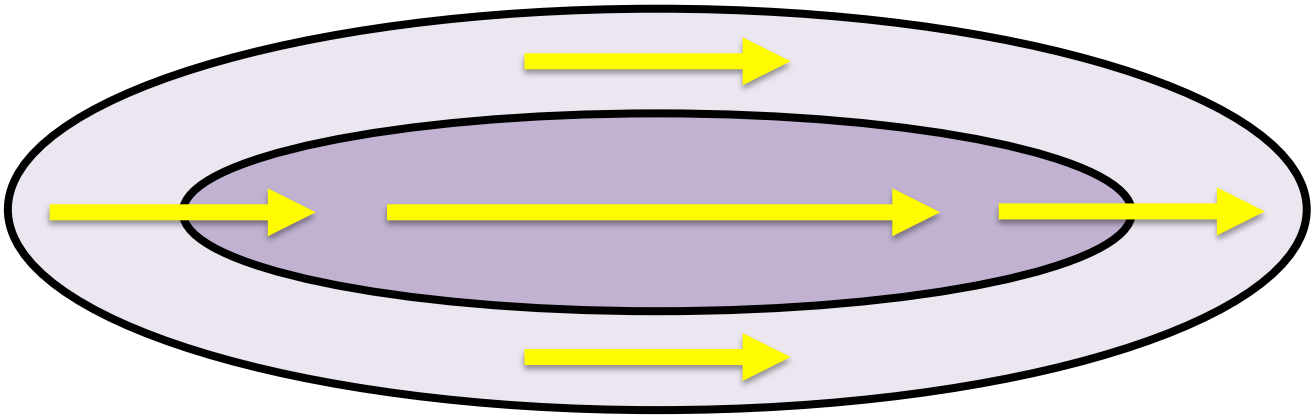

No wind speed
Slow wind speed
Fast wind speed

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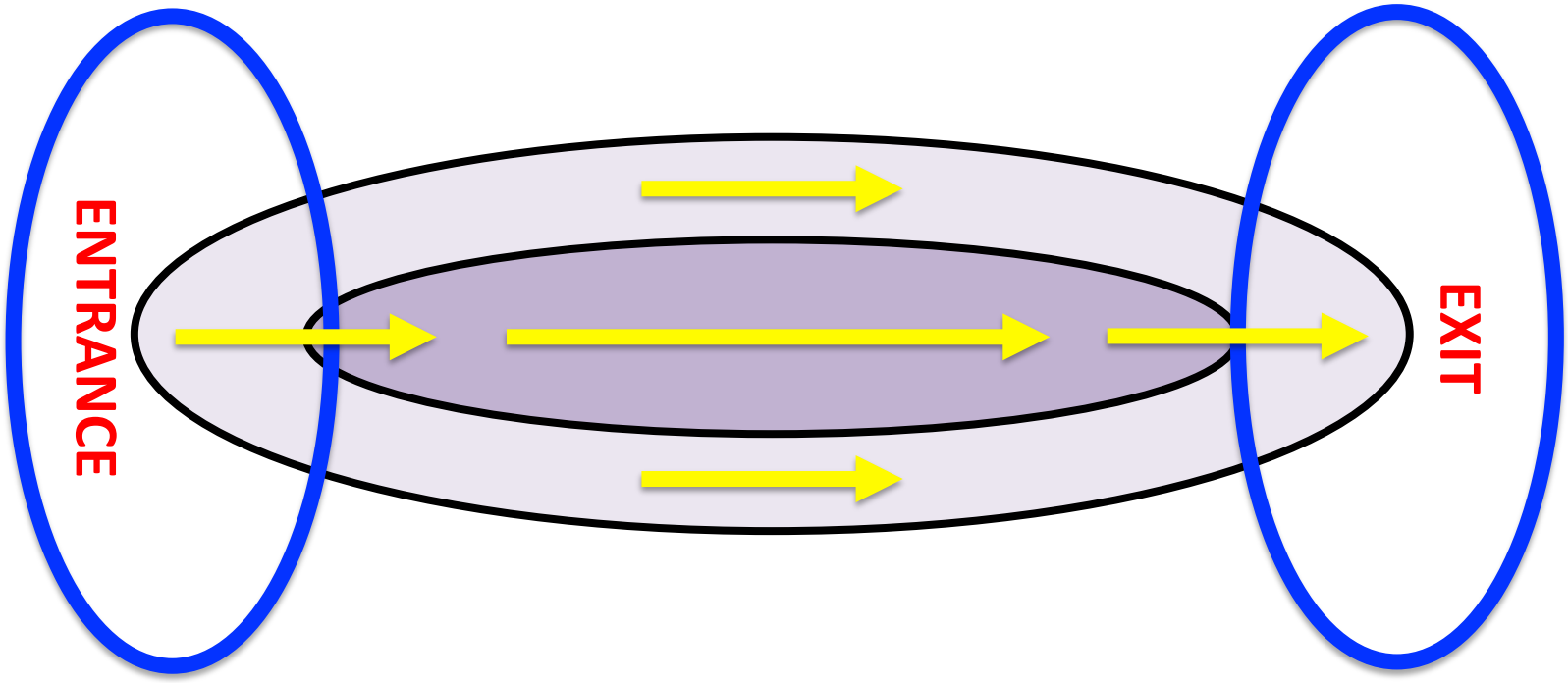

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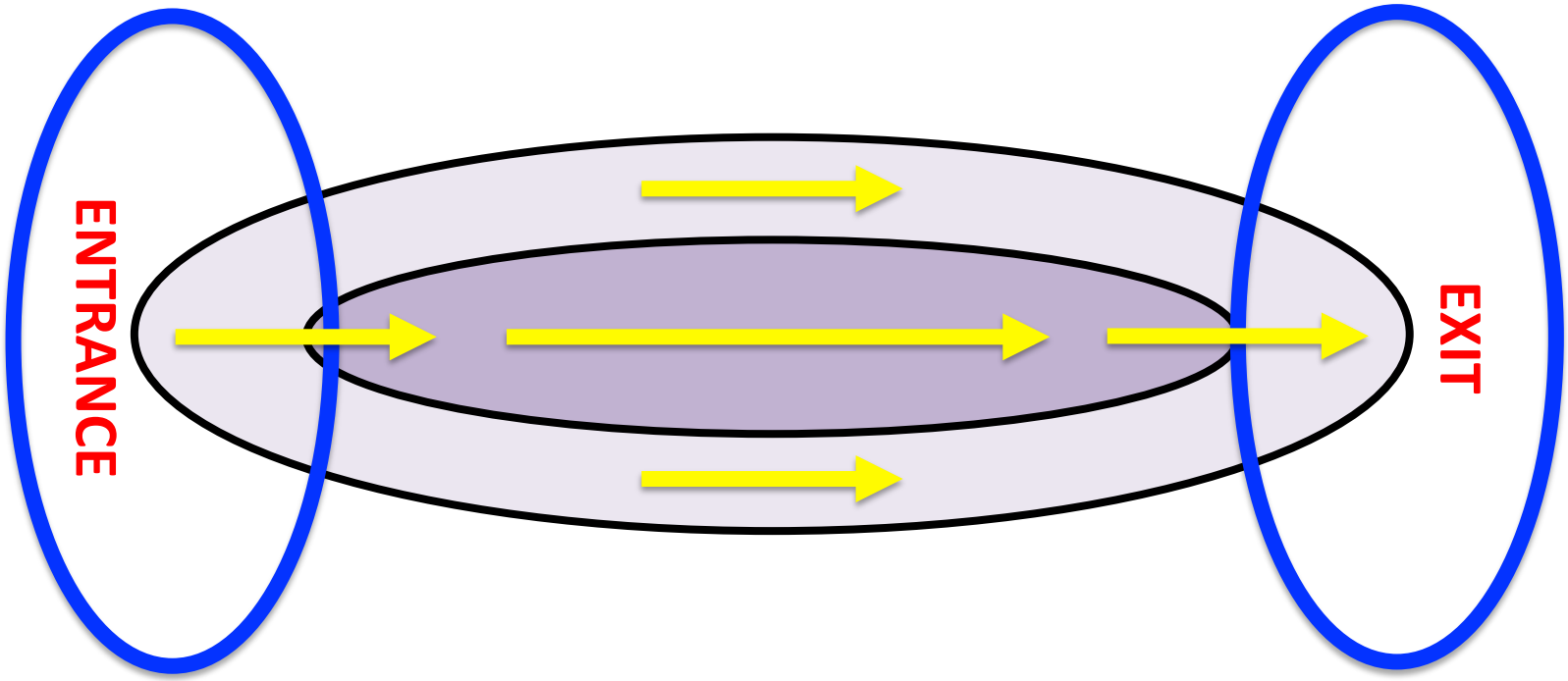

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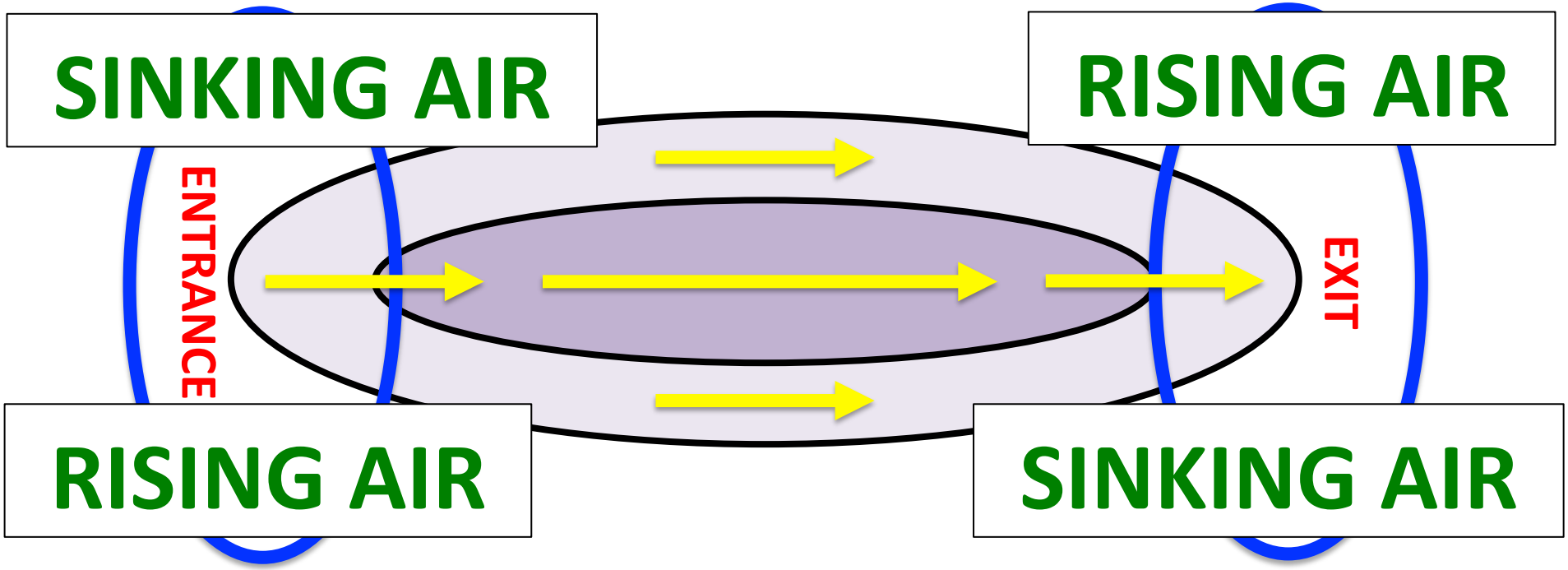

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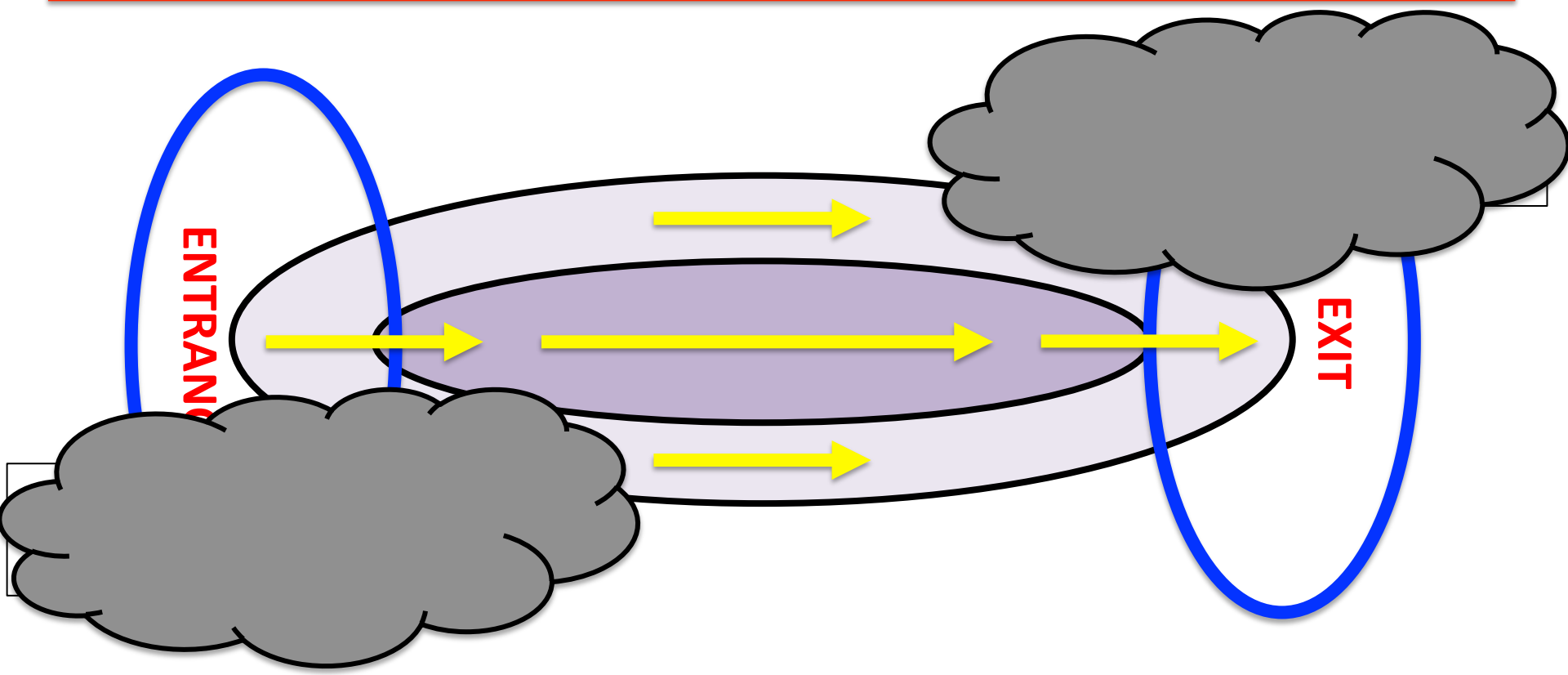

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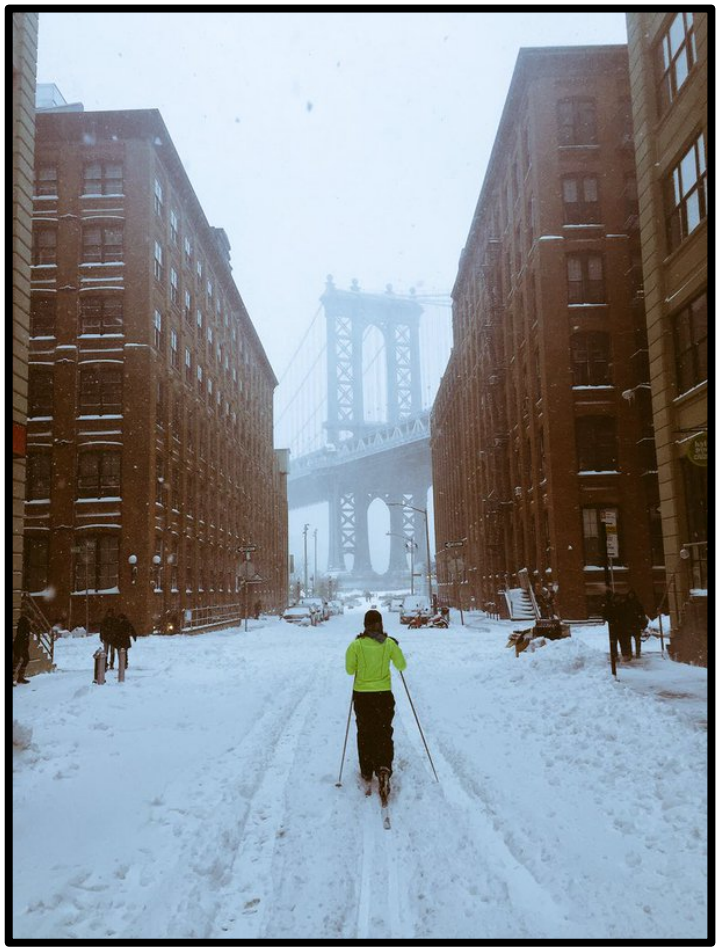
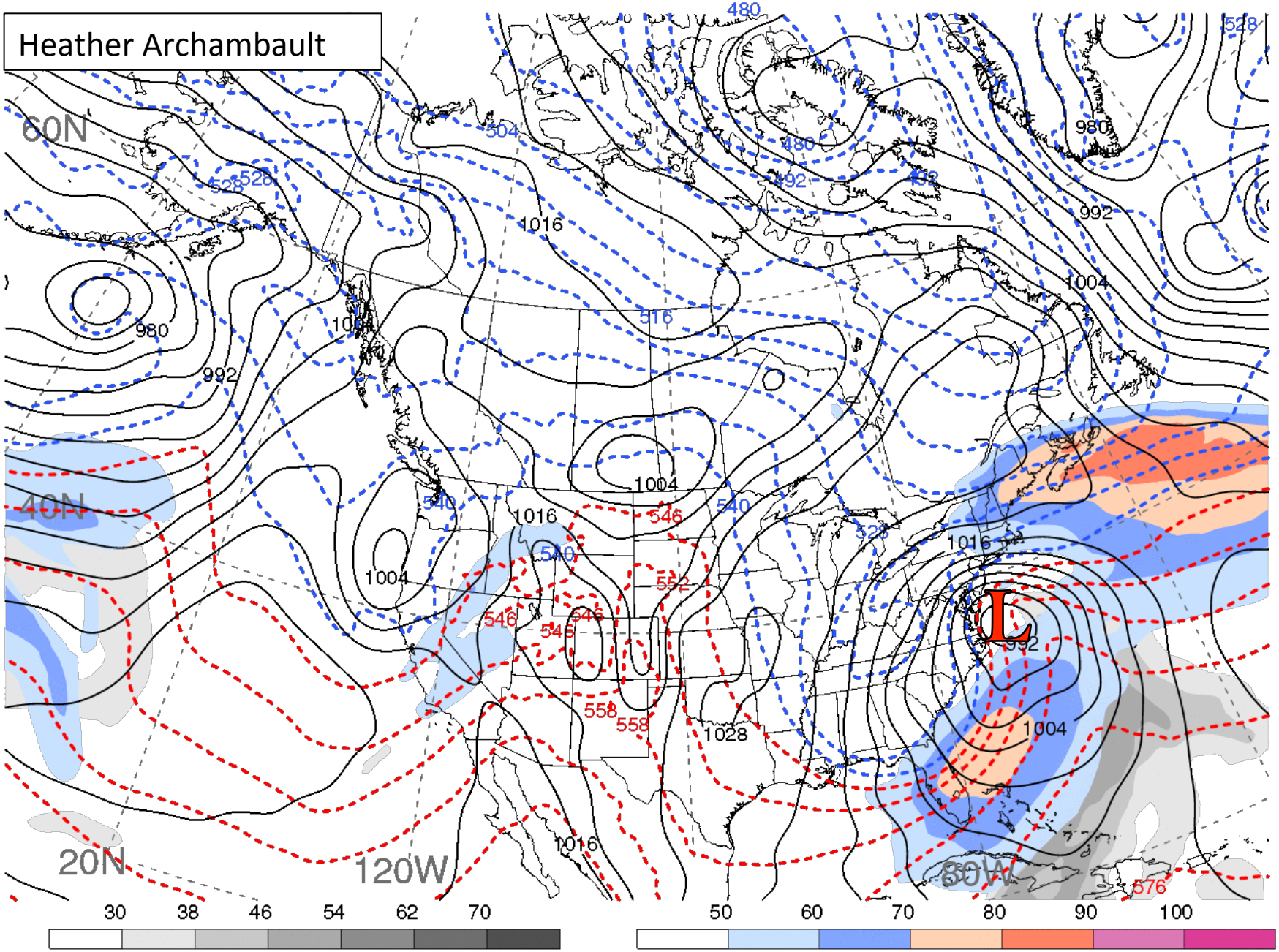
How do Jet Streams Impact the Weather?

1) East Coast Snowstorms

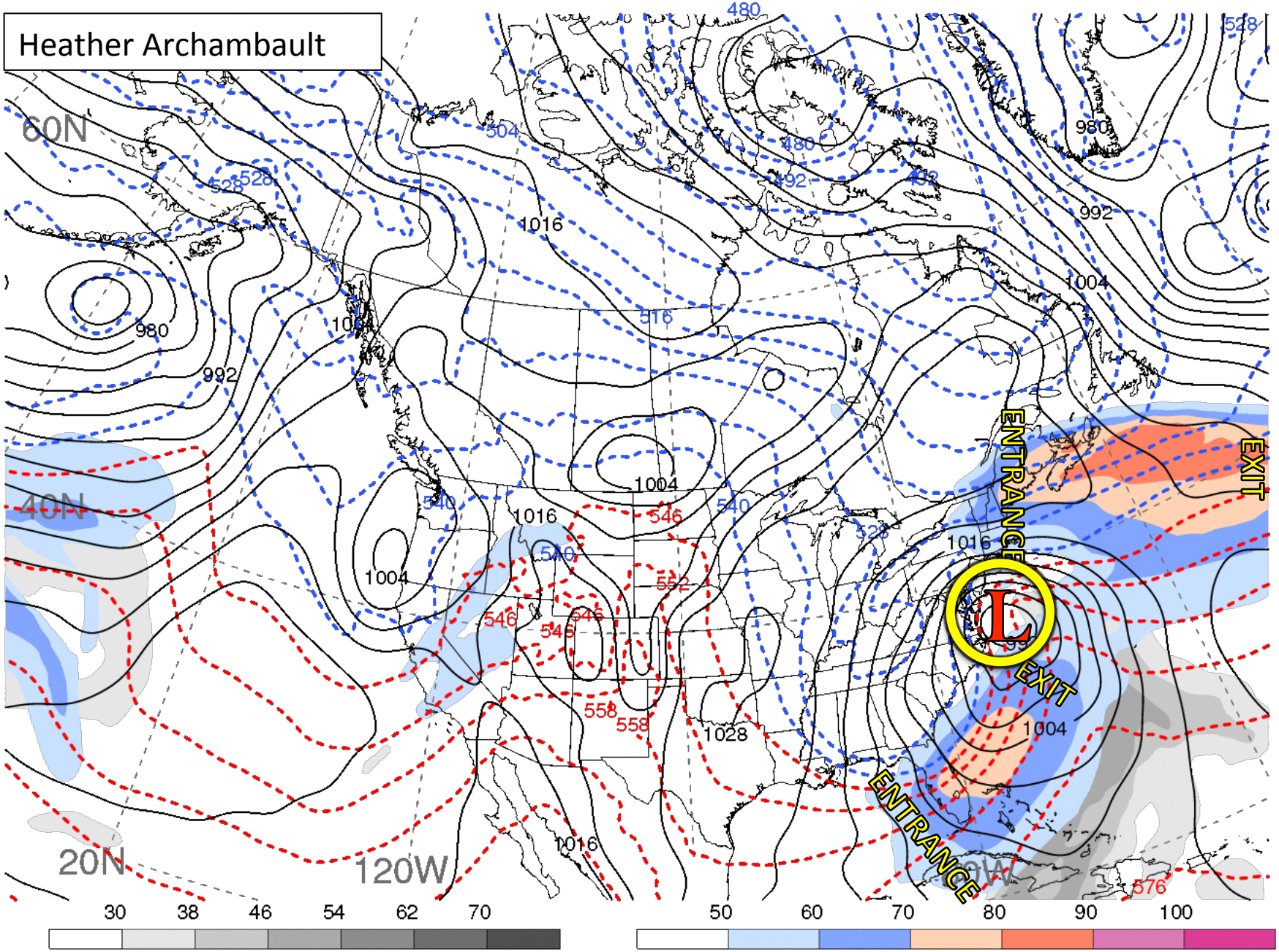


Jamie Henn – Twitter

Heather Archambault



1000–500 hPa Thick, PW, SLP, 250 hPa Wnd at 160123/1200


Heather Archambault
60N
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ENTRANCE
EXIT
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1000–500 hPa Thick, PW, SLP, 250 hPa Wnd at 160123/1200

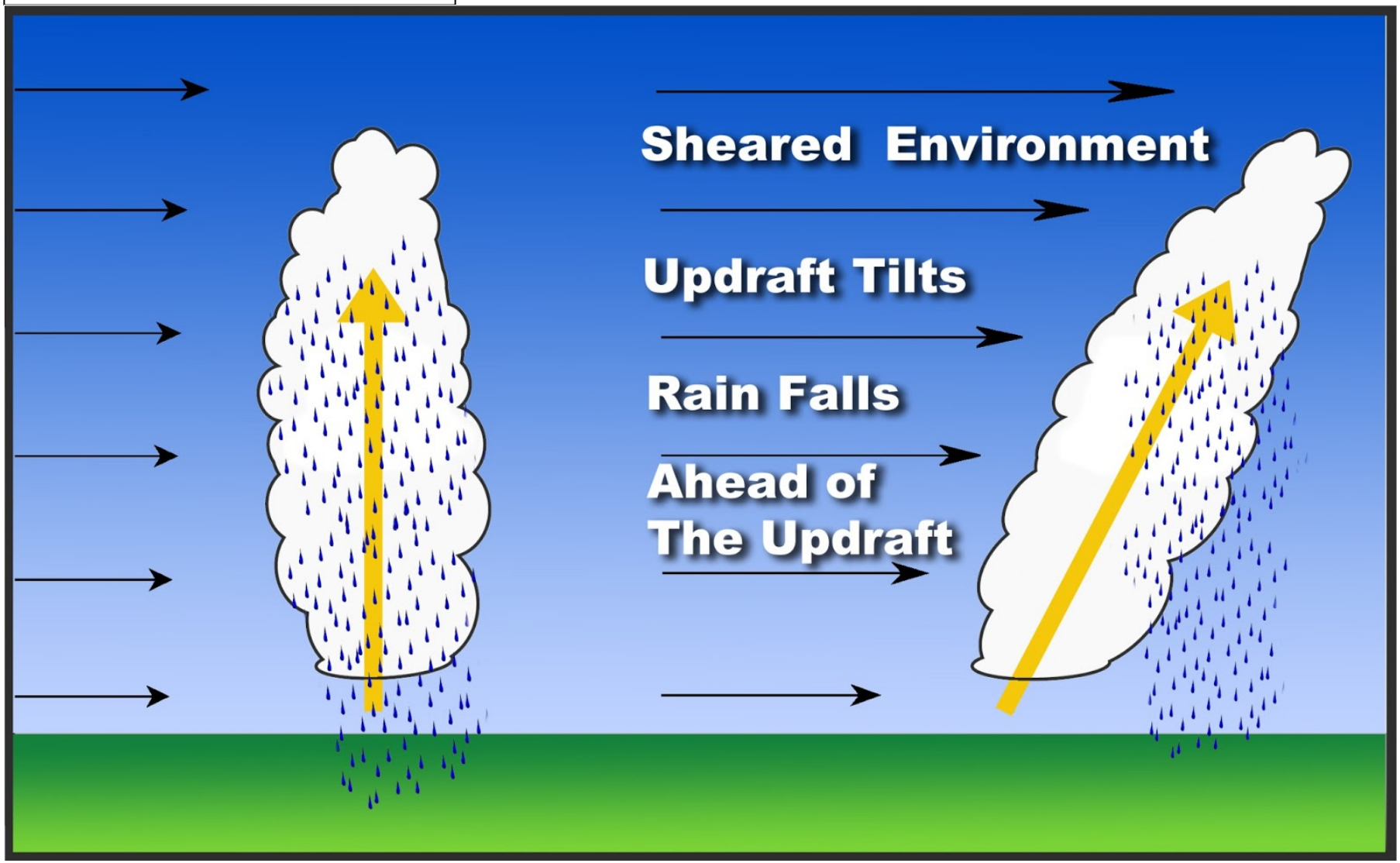
How do Jet Streams Impact the Weather?

1) East Coast snowstorms

2) Severe weather outbreaks

Brandon Sanders

National Weather Service



How do Jet Streams Impact the Weather?

1) East Coast snowstorms

2) Severe weather outbreaks

3) Airplane turbulence

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