Ben Moore’s Trajectory Calculations: October 2007 Linked Extreme Weather Events

Atm 611 Fall 2014
Large-Scale Flow Amplification: Lagrangian Perspective

DT wind speed (m s$^{-1}$, shading), $\theta$ (K, black) 72-h backward trajectories ending in jet stream

Legend

High-latitude isentropic

Warm conveyor belt

$\circ$ = TC Kajiki

= TC Kajiki

0.5° CFSR
Large-Scale Flow Amplification: Lagrangian Perspective

DT wind speed (m s$^{-1}$, shading), $\theta$ (K, black)
72-h backward trajectories ending in jet stream

Legend
High-latitude isentropic
Warm conveyor belt

$\therefore$ = TC Kajiki
Large-Scale Flow Amplification: Lagrangian Perspective

1200 UTC 19 Oct 2007

DT wind speed (m s$^{-1}$, shading), $\theta$ (K, black)
72-h backward trajectories ending in jet stream

$\mathcal{S} = $ TC Kajiki

Legend

High-latitude isentropic
Warm conveyor belt

Legend

Ending
1200 UTC
21 Oct
0000 UTC
23 Oct

0.5° CFSR
Large-Scale Flow Amplification: Lagrangian Perspective

DT wind speed (m s\(^{-1}\), shading), \(\theta\) (K, black)
72-h backward trajectories ending in jet stream

\(\theta\) = TC Kajiki

Legend

- High-latitude isentropic
- Warm conveyor belt

Ending
1200 UTC 21 Oct
0000 UTC 23 Oct

Potential Vorticity (PVU)

Potential Temperature (K)

Specific humidity (g kg\(^{-1}\))

Pressure (hPa)

Wind speed (m s\(^{-1}\))

0.5° CFSR
Large-Scale Flow Amplification: Lagrangian Perspective

DT wind speed ($m \ s^{-1}$, shading), $\theta$ (K, black)
72-h backward trajectories ending in jet stream

Legend
- High-latitude isentropic
  - Ending 1200 UTC 21 Oct
  - Ending 0000 UTC 23 Oct
- Warm conveyor belt
  - Light blue
  - Dark blue
  - Orange
  - Red
Large-Scale Flow Amplification: Lagrangian Perspective

DT wind speed (m s$^{-1}$, shading), $\theta$ (K, black)
72-h backward trajectories ending in jet stream

$\mathcal{S} = $ TC Kajiki

Legend
High-latitude isentropic
- Light blue
- Blue
Warm conveyor belt
- Orange
- Red

- PV
- Potential Vorticity (PVU)
- Wind speed (m s$^{-1}$)

5000 UTC 21 Oct 2007
0000 UTC 21 Oct 2007
1200 UTC 21 Oct
0000 UTC 23 Oct
19 20 21 22 23
1 2 3 4 5
0 10 20 30 40
10 20 30 40
Large-Scale Flow Amplification: Lagrangian Perspective

Legend

High-latitude isentropic
- Light blue
- Dark blue

Warm conveyor belt
- Orange
- Red

DT wind speed (m s\(^{-1}\), shading), \(\theta\) (K, black)
72-h backward trajectories ending in jet stream

0.5° CFSR
0000 UTC 22 Oct 2007

DT wind speed ($m \text{s}^{-1}$, shading), $\theta$ (K, black)
72-h backward trajectories ending in jet stream

Legend
- High-latitude isentropic
- Warm conveyor belt

$\zeta = \text{TC Kajiki}$

Large-Scale Flow Amplification: Lagrangian Perspective

$P$, $q$, $\theta$, $PV$, $\nabla \times \mathbf{V}$

0.5° CFSR
Large-Scale Flow Amplification: Lagrangian Perspective

DT wind speed (m s\(^{-1}\), shading), \(\theta\) (K, black)
72-h backward trajectories ending in jet stream

\(\text{\LARGE S} = \text{TC Kajiki}\)

**Legend**

- High-latitude isentropic
- Warm conveyor belt

**Significant Data Points**

- 1200 UTC 21 Oct
- 0000 UTC 23 Oct

**Graph Details**

- Pressure (hPa)
- Specific humidity (g kg\(^{-1}\))
- Potential Temperature (K)
- Potential Vorticity (PVU)
- Wind speed (m s\(^{-1}\))
Large-Scale Flow Amplification: Lagrangian Perspective

Legend
- High-latitude isentropic
- Warm conveyor belt

DT wind speed ($m s^{-1}$, shading), $\theta$ (K, black)
72-h backward trajectories ending in jet stream

0000 UTC 23 Oct 2007