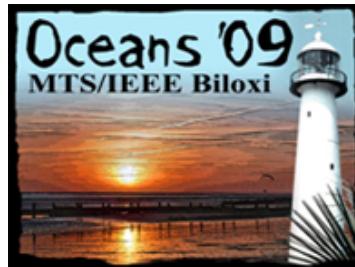


Illustrative Visualization Techniques for Hurricane Advisory Information

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T.J. Jankun-Kelly (MSU)

J. Edward Swan II (MSU)



NOAA NHC Wind Swath Advisory

Hurricane Katrina 2005

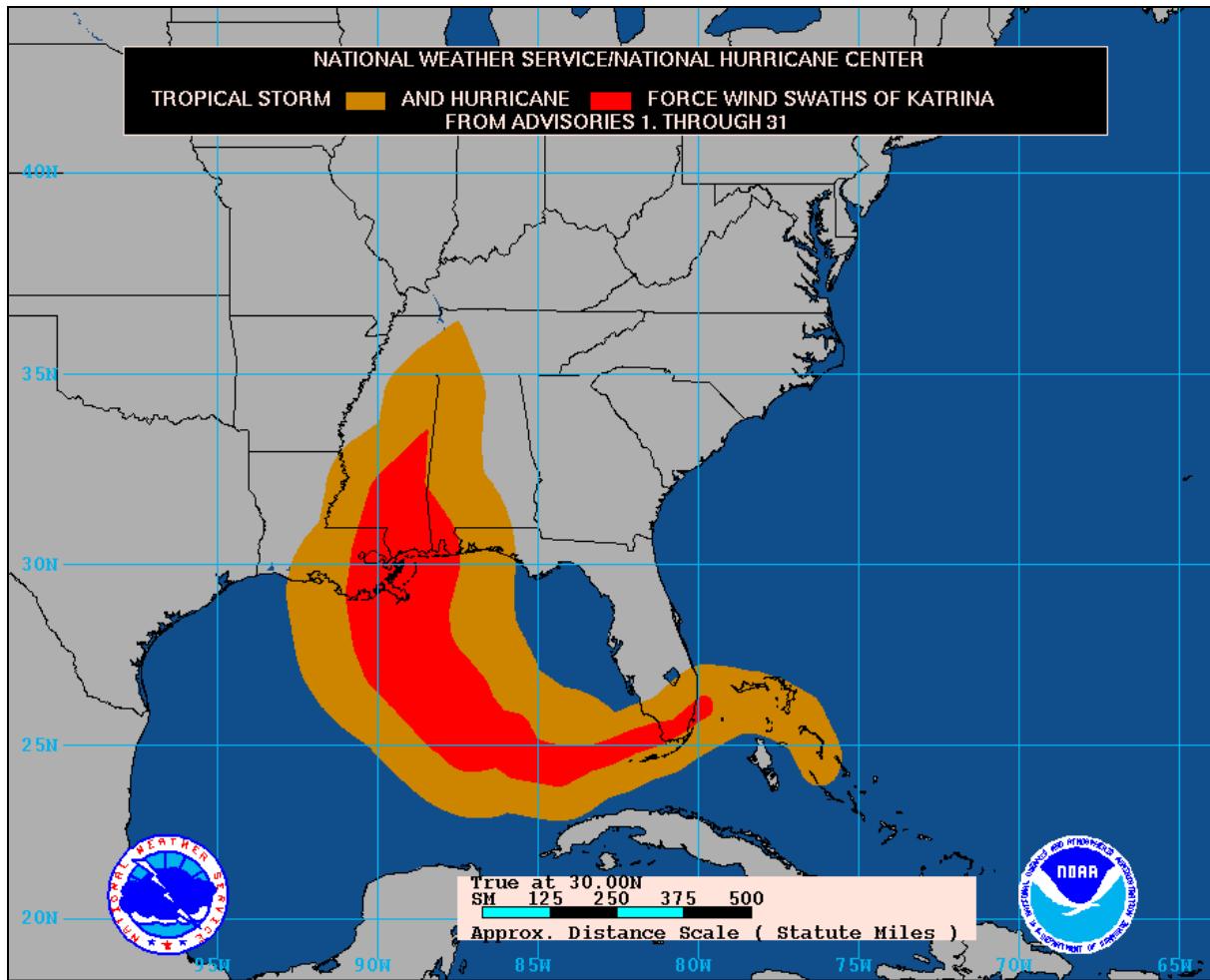


Image Courtesy NOAA NHC

<http://www.nhc.noaa.gov/archive/2005/KATRINA.shtml?>

NOAA NHC Storm Advisories

- NOAA NHC Archive
- Advisory lists:
 - Center position
 - Position accuracy
 - Wind speed and wind gust
 - Pressure
 - Movement direction and speed
 - Eye wall diameter
 - Wind advisory areas for 64, 50, and 34 knots
 - 12 ft. seas advisory area
 - 3-day and 5-day forecasts
 - Position
 - Max wind and wind gust
 - 64, 50, and 34 knot wind areas

ZCZC MIATCMAT2 ALL
TTAA00 KNHC DDDHHH
HURRICANE KATRINA FORECAST/ADVISORY NUMBER 18
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL AL122005
2100Z SAT AUG 27 2005

AT 4 PM CDT...2100Z...THE HURRICANE WATCH IS EXTENDED WESTWARD TO INTRACOASTAL CITY LOUISIANA AND EASTWARD TO THE FLORIDA-ALABAMA BORDER. A HURRICANE WATCH IS NOW IN EFFECT ALONG THE NORTHERN GULF COAST FROM INTRACOASTAL CITY TO THE ALABAMA-FLORIDA BORDER.

A HURRICANE WARNING WILL LIKELY BE REQUIRED FOR PORTIONS OF THE NORTHERN GULF COAST LATER TONIGHT OR SUNDAY. INTERESTS IN THIS AREA SHOULD MONITOR THE PROGRESS OF KATRINA.

AT 5 PM EDT...2100Z...THE TROPICAL STORM WARNING IS DISCONTINUED FOR THE FLORIDA KEYS.

HURRICANE CENTER LOCATED NEAR 24.6N 85.6W AT 27/2100Z
POSITION ACCURATE WITHIN 10 NM

PRESENT MOVEMENT TOWARD THE WEST OR 275 DEGREES AT 6 KT

ESTIMATED MINIMUM CENTRAL PRESSURE 945 MB
EYE DIAMETER 45 NM

MAX SUSTAINED WINDS 100 KT WITH GUSTS TO 120 KT.

64 KT..... 40NE 30SE 30SW 30NW.

50 KT..... 60NE 60SE 60SW 60NW.

34 KT.....140NE 90SE 90SW 130NW.

12 FT SEAS..150NE 90SE 100SW 180NW.

WINDS AND SEAS VARY GREATLY IN EACH QUADRANT. RADII IN NAUTICAL MILES ARE THE LARGEST RADII EXPECTED ANYWHERE IN THAT QUADRANT.

REPEAT...CENTER LOCATED NEAR 24.6N 85.6W AT 27/2100Z
AT 27/1800Z CENTER WAS LOCATED NEAR 24.5N 85.3W

FORECAST VALID 28/0600Z 24.9N 86.8W

MAX WIND 105 KT...GUSTS 130 KT.

64 KT... 40NE 30SE 30SW 30NW.

50 KT... 60NE 60SE 60SW 60NW.

34 KT...140NE 90SE 90SW 130NW.

FORECAST VALID 28/1800Z 25.8N 88.3W

MAX WIND 115 KT...GUSTS 140 KT.

64 KT... 40NE 30SE 30SW 30NW.

50 KT... 75NE 75SE 60SW 75NW.

34 KT...140NE 100SE 100SW 140NW.

FORECAST VALID 29/0600Z 27.5N 89.6W

MAX WIND 120 KT...GUSTS 145 KT.

64 KT... 40NE 30SE 30SW 30NW.

50 KT... 75NE 75SE 60SW 75NW.

34 KT...140NE 100SE 100SW 140NW.

NOAA NHC Forecasts and Strike Probabilities

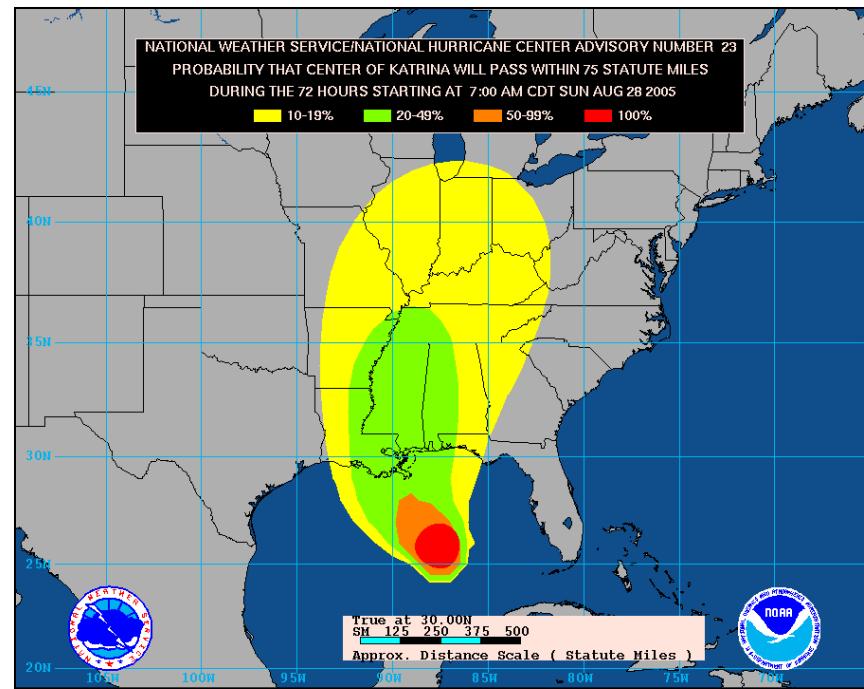
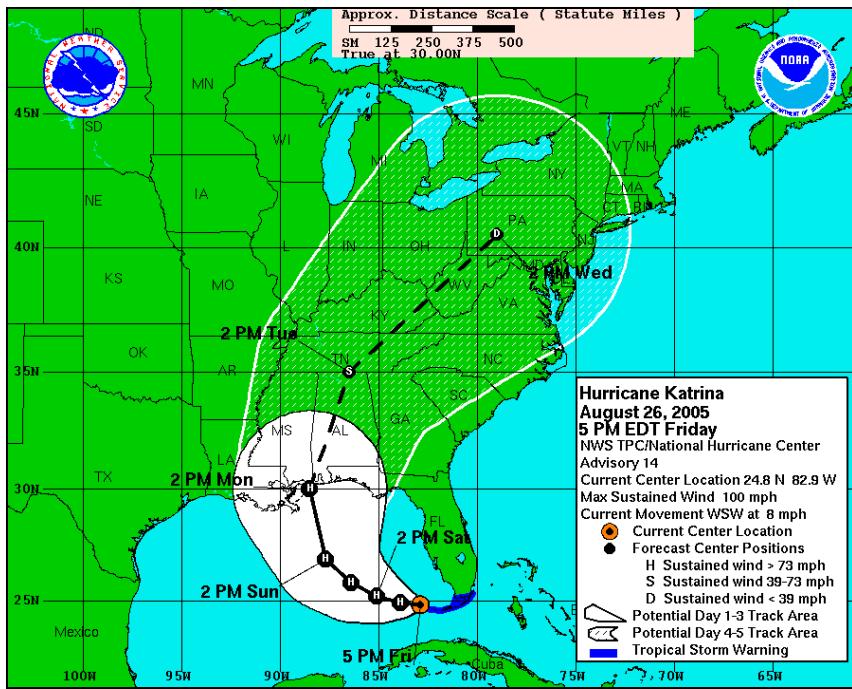
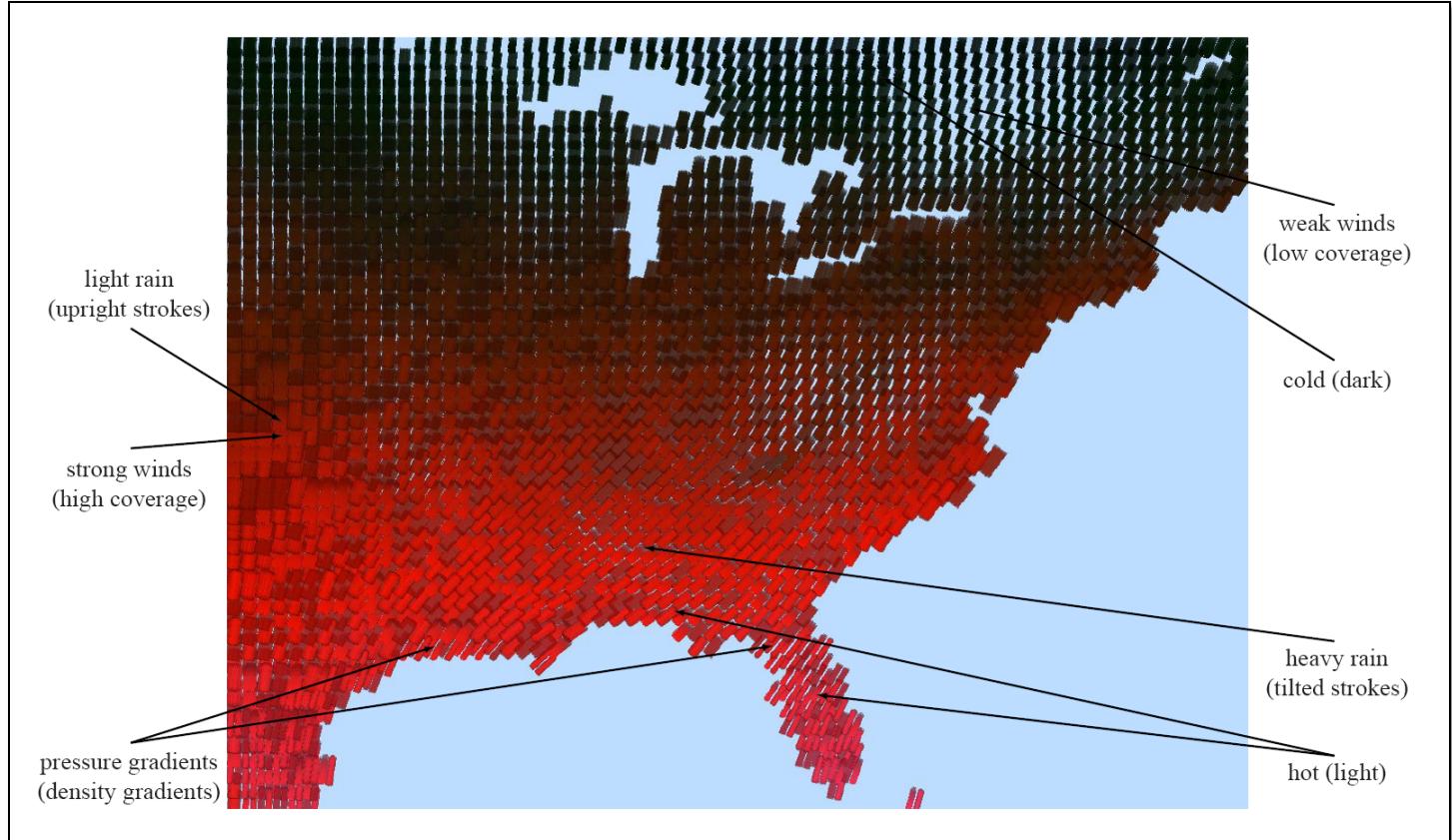
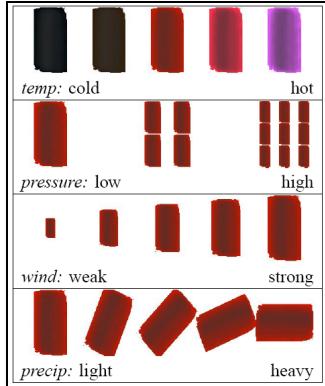


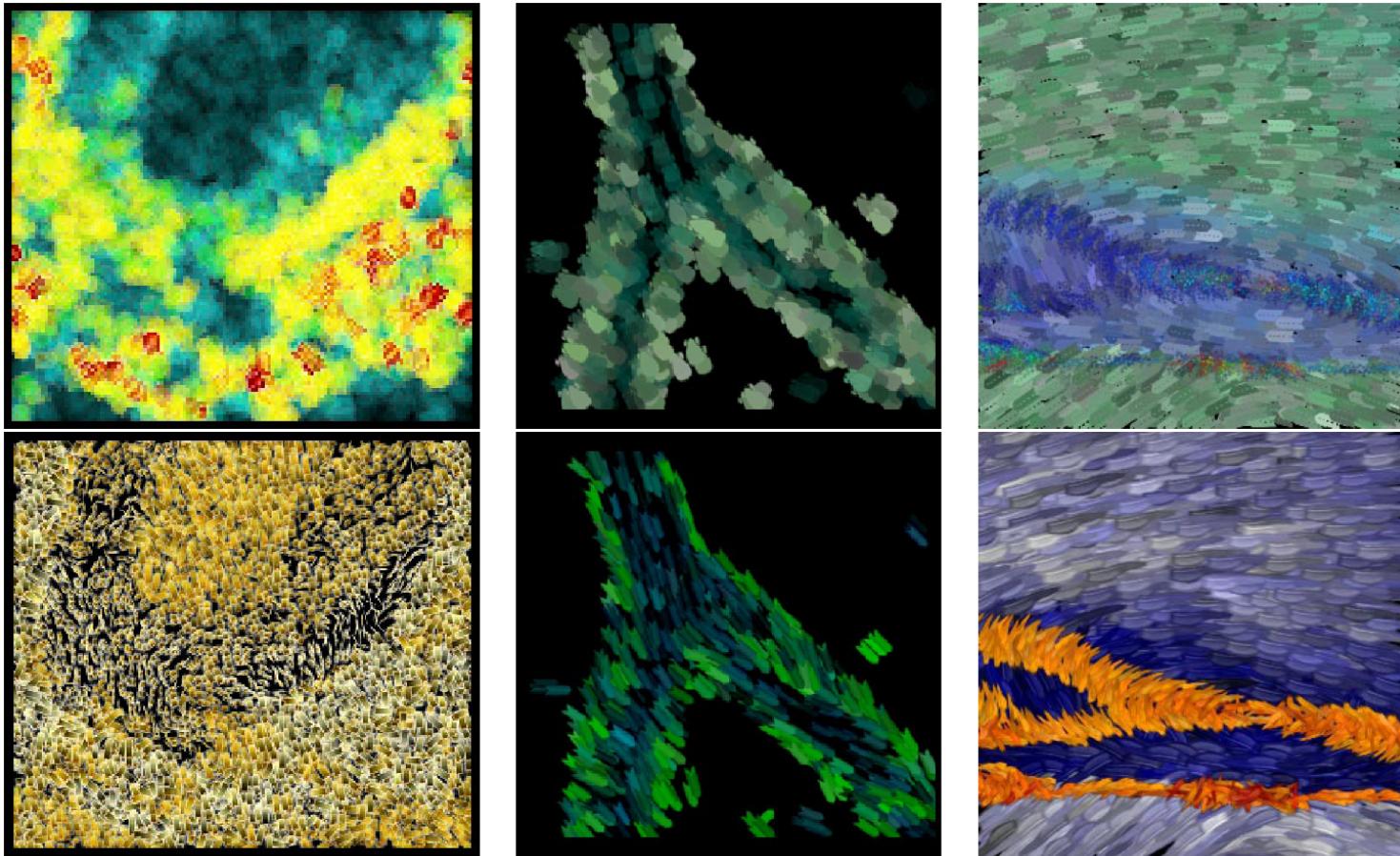
Image Courtesy NOAA NHC

<http://www.nhc.noaa.gov/archive/2005/KATRINA.shtml?>

Related Work

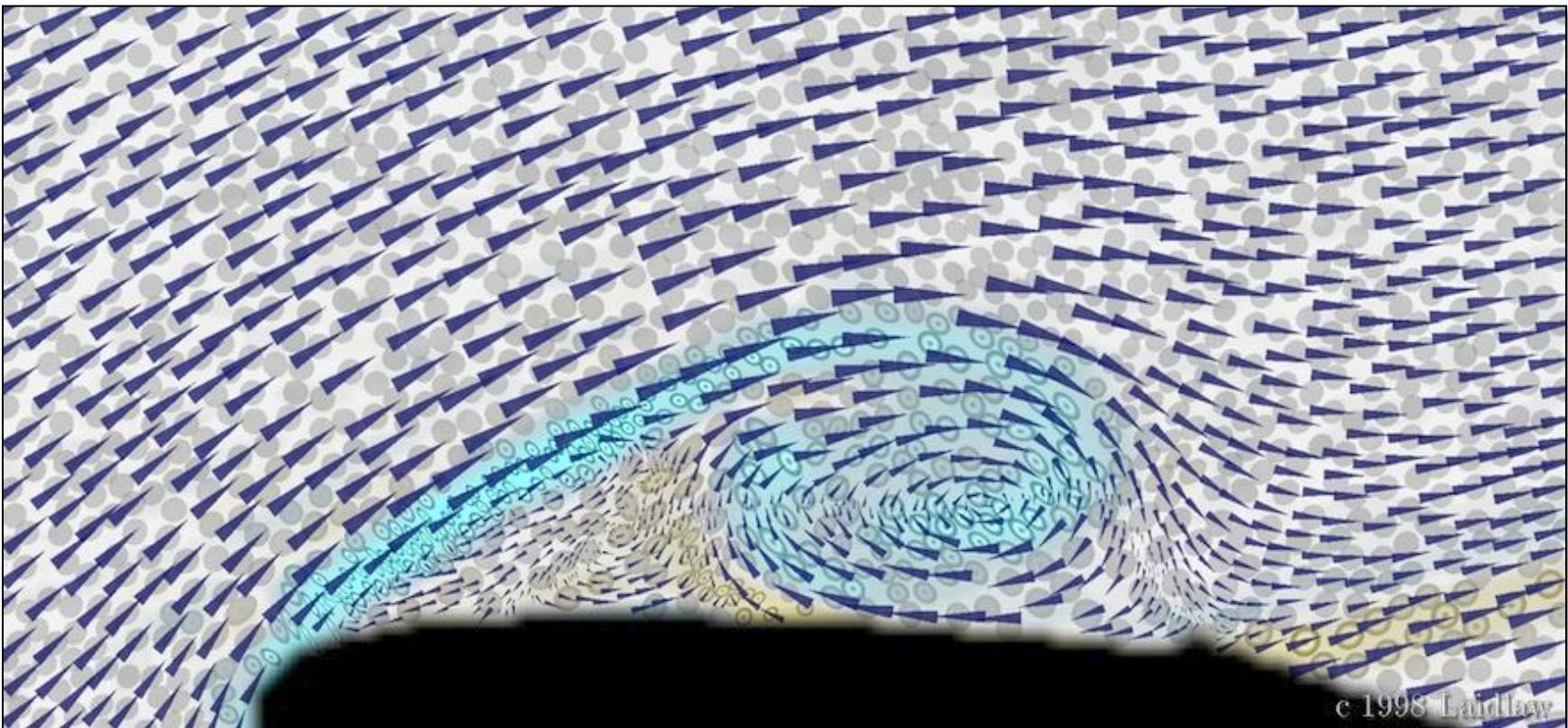


Related Work



Kirby & Laidlaw, Vis Handbook, 2004

Brush Strokes

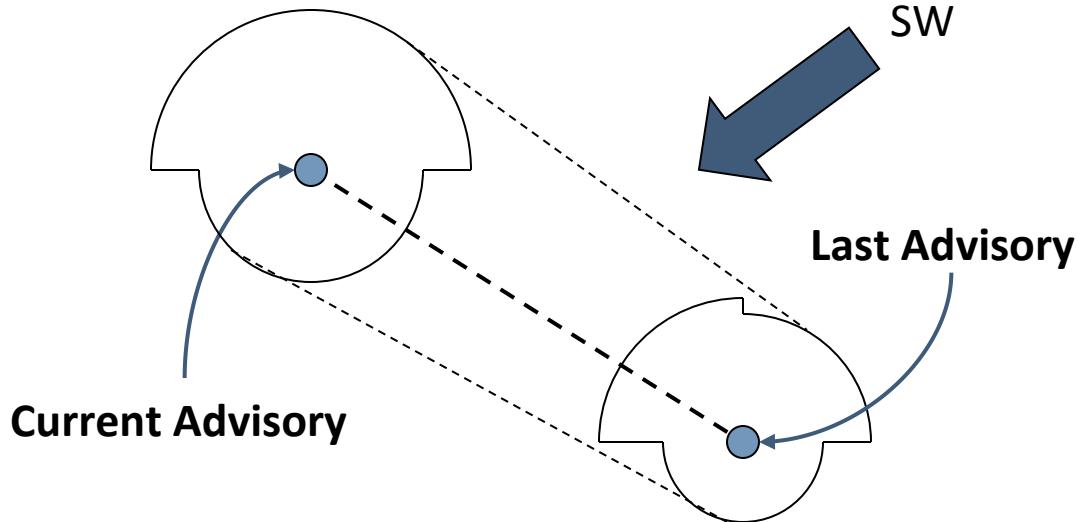
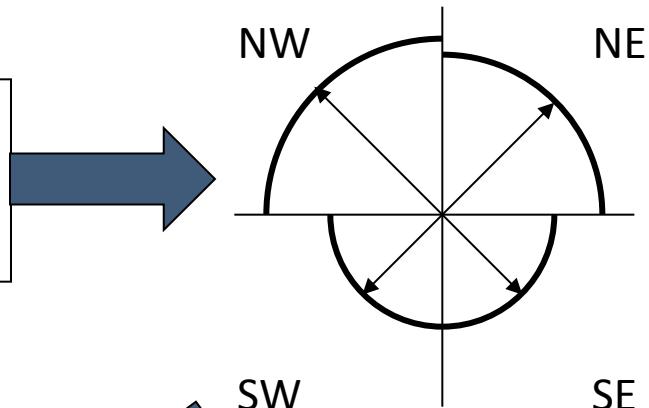


c 1998 Laidlaw

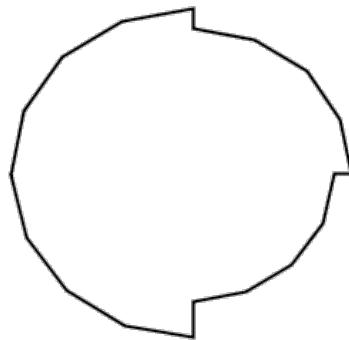
Kirby & Laidlaw, 1999

Wind Swath Rendering

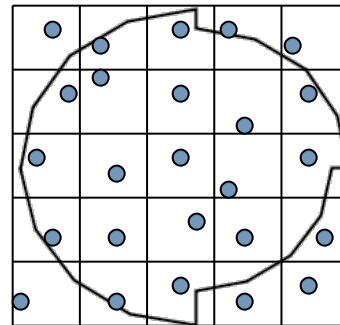
64 KT..... 40NE 30SE 30SW 30NW.
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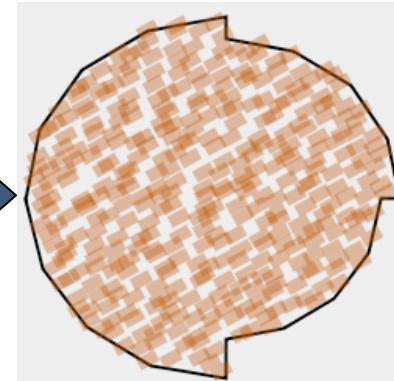
Small Brush Stroke Rendering



Wind Swath



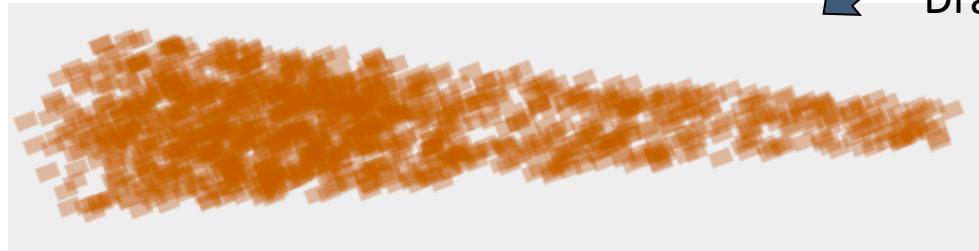
Impose Grid
Random Rendering Order
Jitter Cell Centers



Strokes in Wind Swath
Shape are Drawn

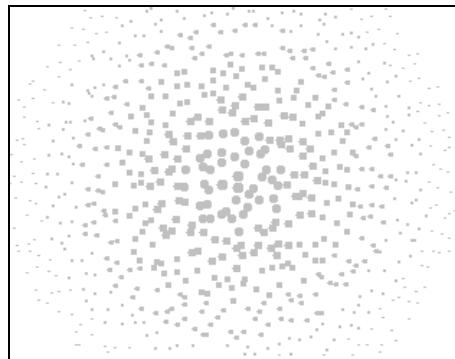


Draw Line

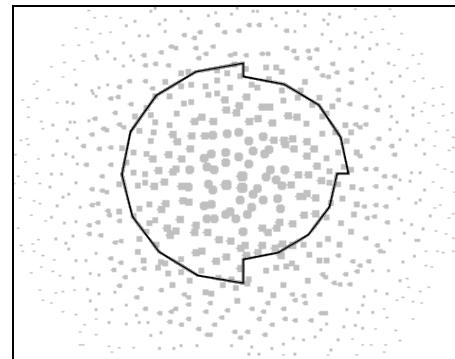


Artistic Line

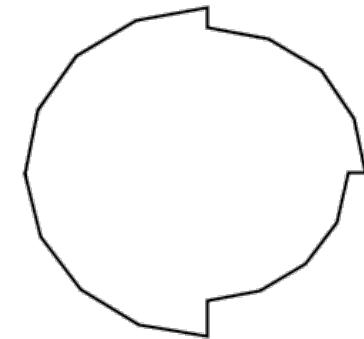
Long Stroke Rendering



Procedurally Generated
Texture

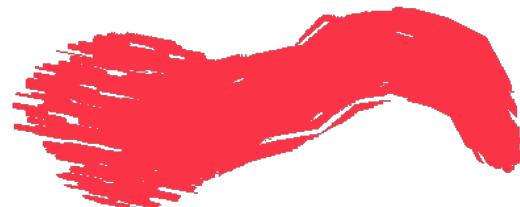


Mask Texture

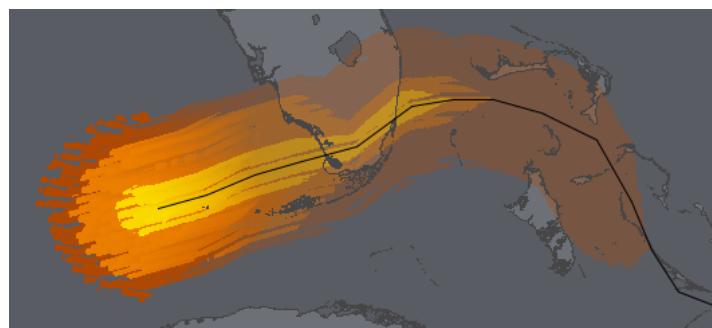
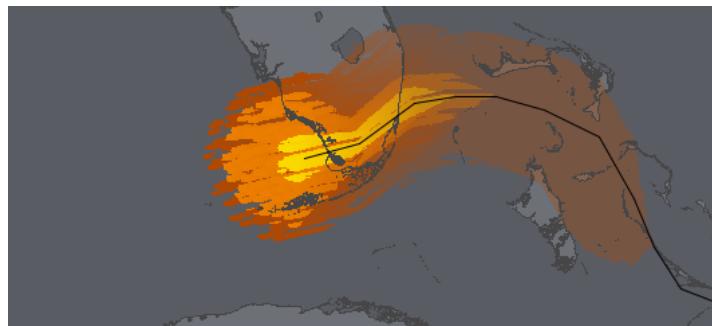
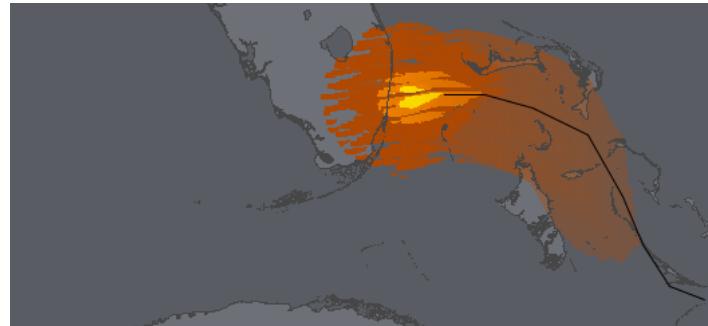


Wind Swath

Draw Line



Temporal Fading Effect



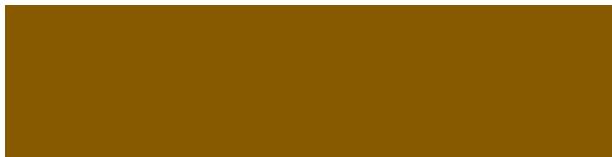
Color Labeling



64 Knots [250, 218, 0]



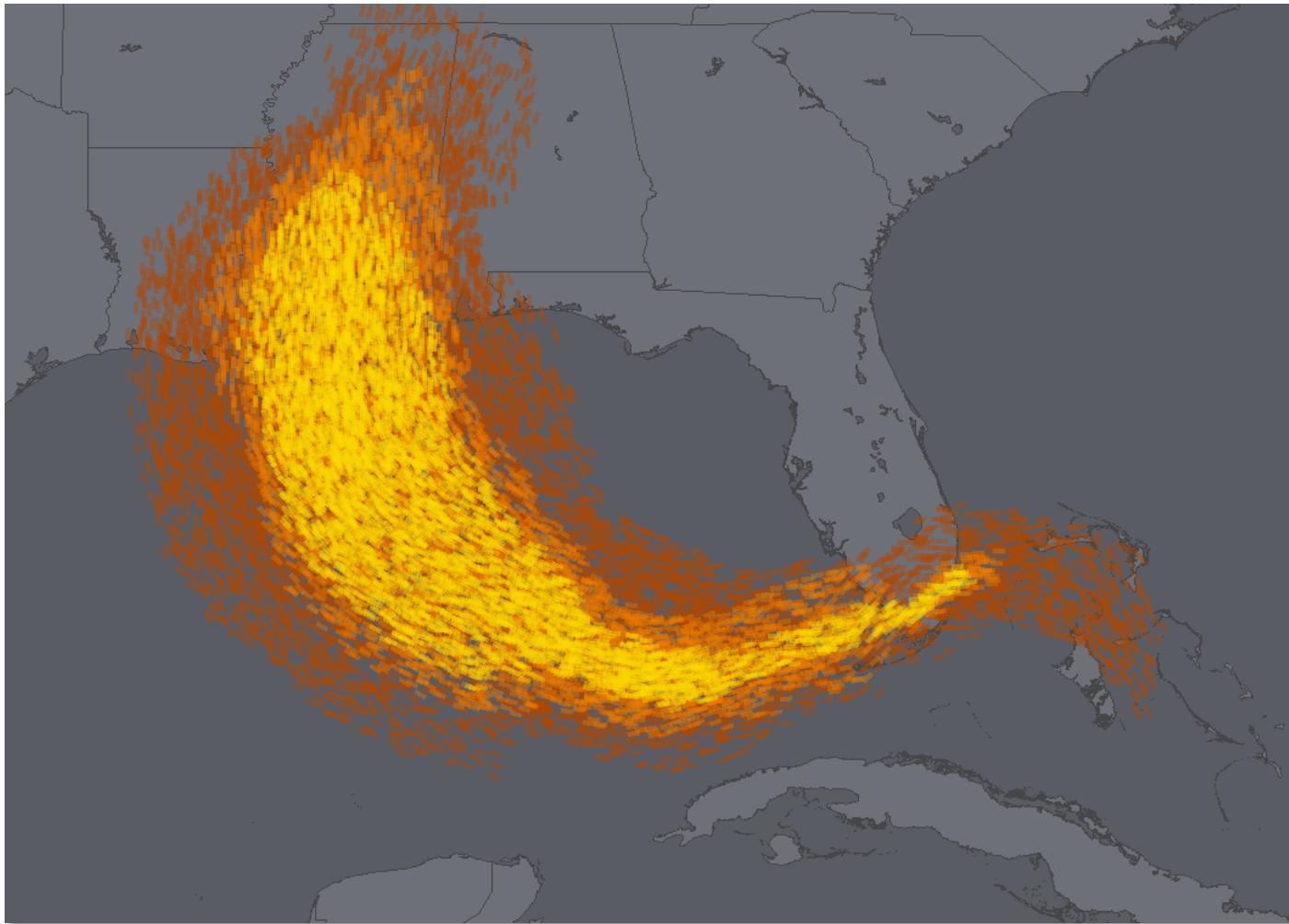
50 Knots [235, 125, 0]



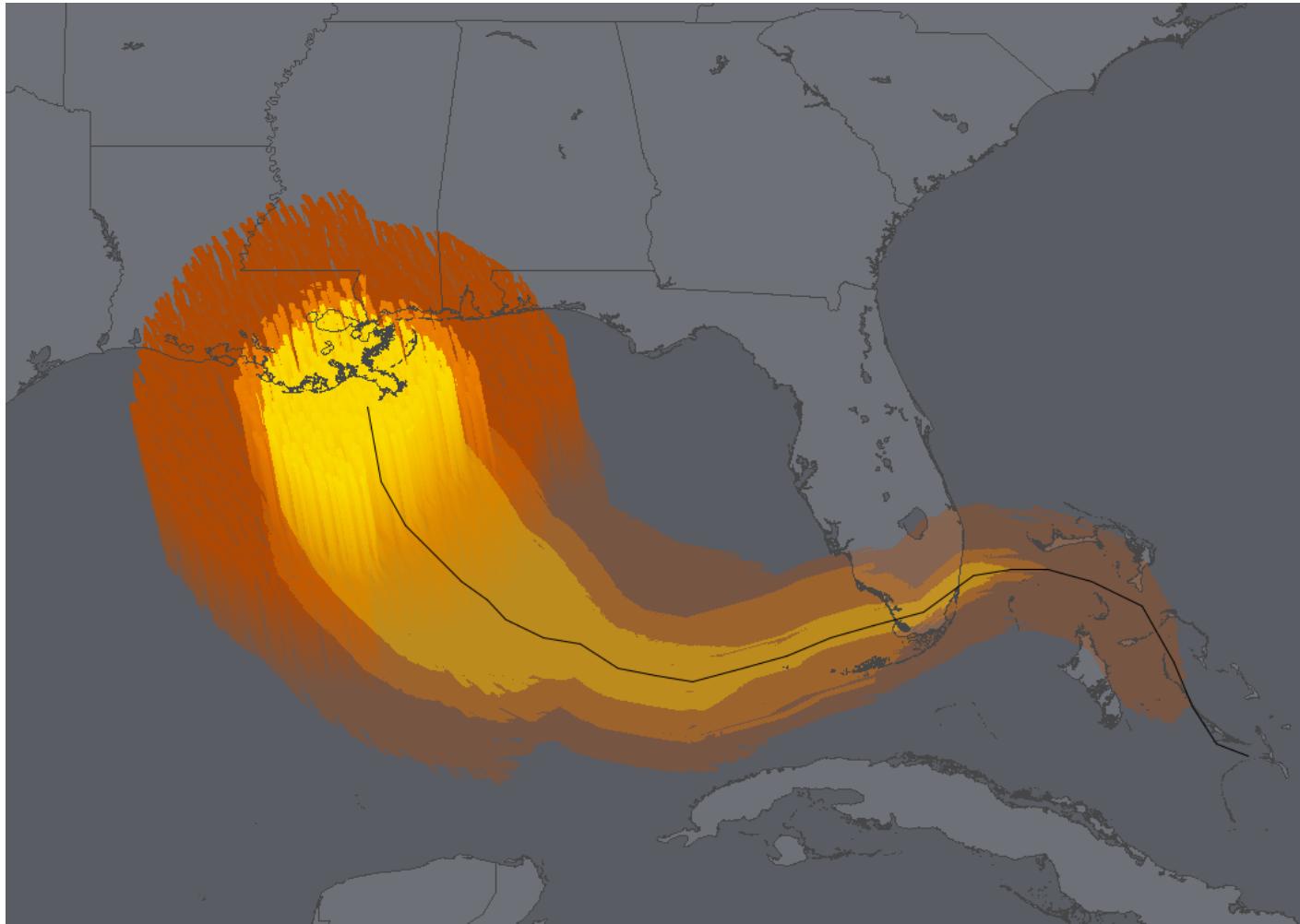
34 Knots [177, 72, 0]

Small Stroke Result

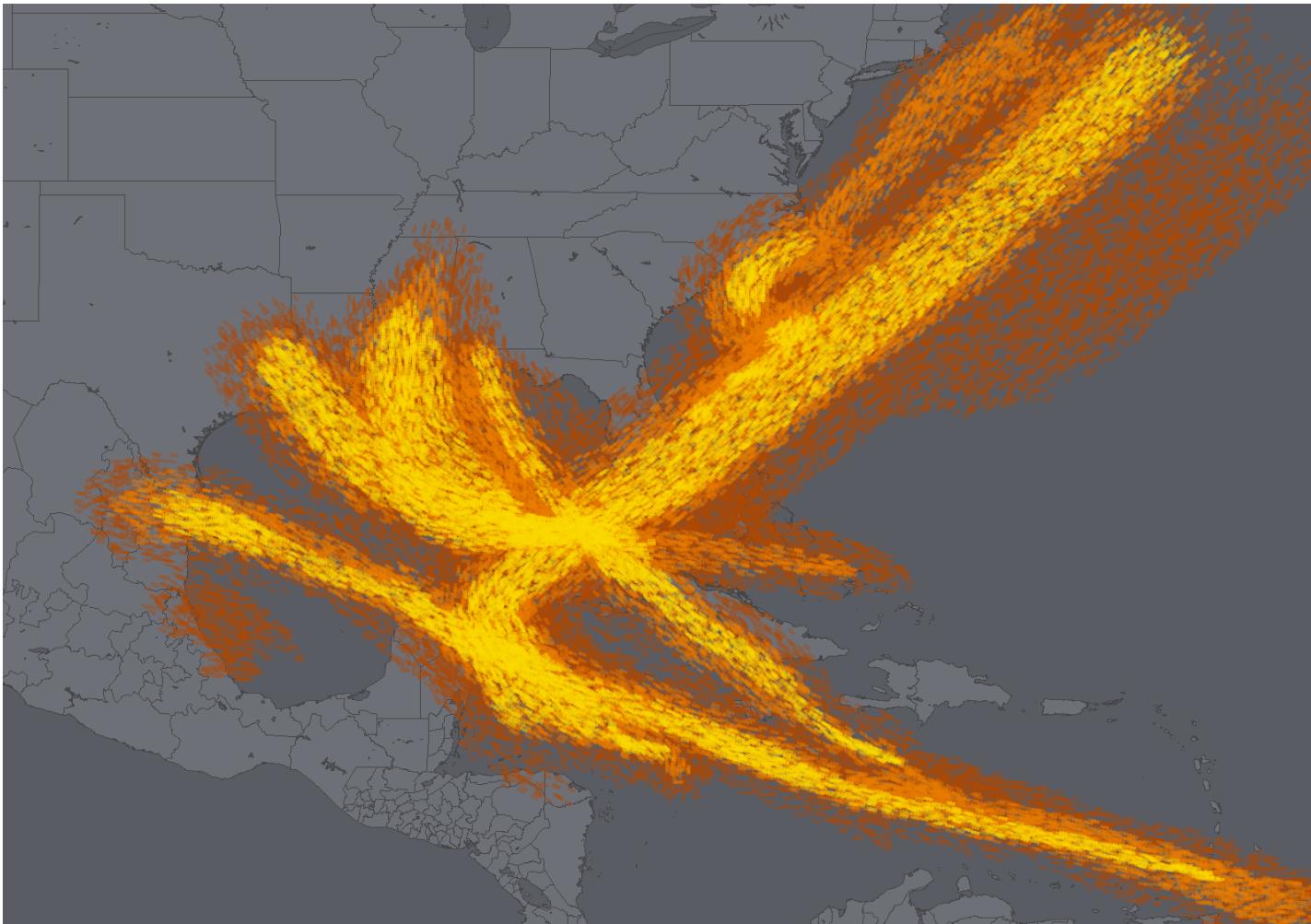
Hurricane Katrina 2005



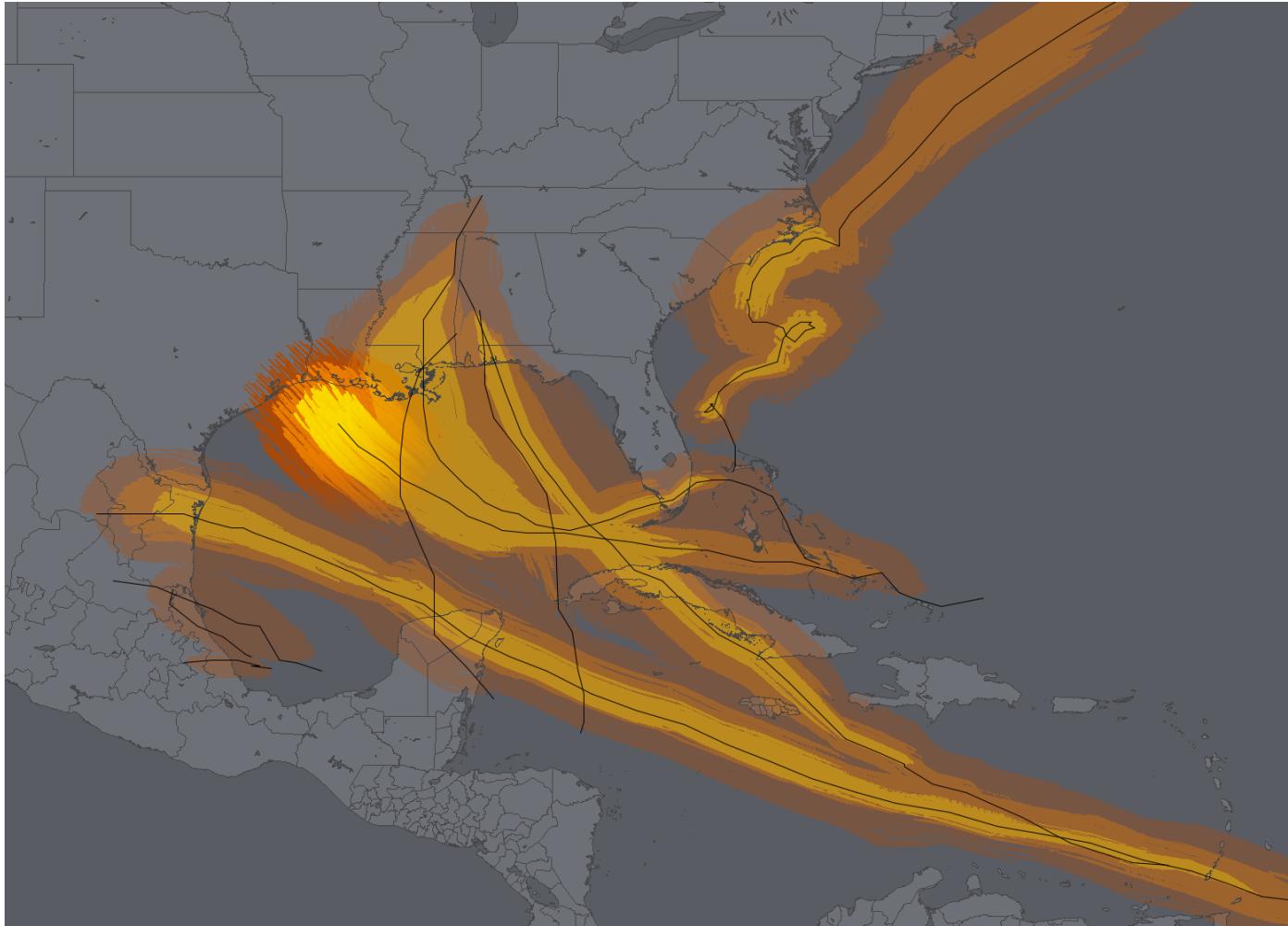
Long Strokes with Fading Results



Small Stroke Multiple 2005 Storms



Long Strokes with Fading Multiple 2005 Storms



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