

Rapid Flood Mapping

Post-disaster Aerial Imagery in 24 Hours

- MAY 30, 2019



Introduction

We have been involved in aviation-based disaster relief since hurricane Harvey decimated the Houston area in 2017. One of the initial observations we had during that storm and subsequent storms in 2018 and 2019 was how aerial data collection could possibly be very useful to government, military, and corporate interests in the ground, but was not being collected and collated in an actionable way. This document proposes one such activity: aerial surveys of primary and secondary highway systems immediately after a major storm event.



What has been seen, but not captured¹

Satellite imagery has largely replaced the more traditional activity of aerial survey, but space-based imaging has limitations that make it sub-optimal for disaster relief and emergency management. Firstly, non-RADAR satellites are unable to see through the cloud cover which exists during storm events. RADAR satellite imagery, when widely available for civilian use, will have the limitation of producing black and white images that must be logarithmically analyzed. We can produce aerial photo maps that may be interpreted with the human eye, by anyone, without the necessity of software development or specialized training in RADAR data analysis.

We are able to provide this data at low cost, due to the intersection of modern advances in aircraft GPS-based avionics, photogrammetry software, cloud service data processing power, and high resolution camera sensors. This document is both a proposal for funding of this activity, and a description of our verifiable methods and their associated costs. The culmination of these technologies and methods is a conservatively attainable goal of mapping all primary and secondary highway systems in an area affected by a major storm, within 24 hours of the end of the storm event.

¹ Images from aircraft flying over areas affected by hurricane Harvey, 2017 and hurricane Florence, 2018.

Table of Contents

Rapid Flood Mapping	1
Introduction	2
Table of Contents	3
Affected Areas: The Nature of Hurricane Flooding	4
Why Not Satellites or Traffic Data?	5
Flying the Roads	6
Processing the Data	7
Appendix A: Hypothetical Affected Roads by State	8
Appendix B: Aircraft Cost Analysis - Cessna 182	19
Appendix C: The Day After Each Storm, 2005 - 2018	22
Hurricane Dennis: Pensacola, Florida 2005	23
Hurricane Katrina: Baton Rouge, Louisiana 2005	25
Hurricane Rita: Beaumont, Texas 2005	27
Hurricane Wilma: Miami, Florida 2005	31
Hurricane Dolly: Padre Island, Texas 2008	33
Hurricane Gustav: Alexandria, Louisiana 2008	36
Hurricane Ike: Houston, Texas 2008	42
Hurricane Irene: Cherry Point, North Carolina 2011	44
Hurricane Irene: Long Island, New York 2011	46
Hurricane Isaac: Baton Rouge, Louisiana 2012	48
Hurricane Sandy: Atlantic City, New Jersey 2012	50
Hurricane Arthur: Beaufort, North Carolina 2014	52
Hurricane Matthew: Mount Pleasant, South Carolina 2016	54
Hurricane Harvey: Houston, Texas 2017	55
Hurricane Irma: Fort Myers, Florida 2017	58
Hurricane Maria: San Juan, Puerto Rico 2017	60
Hurricane Florence: New Bern, North Carolina 2018	61
Hurricane Michael: Apalachicola, Florida 2018	63

Affected Areas: The Nature of Hurricane Flooding

Thirteen states in the U.S. have been affected by major hurricanes since 2005 (the year of hurricane Katrina's destruction of New Orleans). In the northeast these states are New York and New Jersey (hurricane Sandy in 2012), on the other end of the range south Texas based on the impact of hurricane Dolly (Brownsville / Padre Island in 2008), and all coastal states in the U.S. between these points. Since 1980, tropical hurricanes are the costliest weather events in terms of property damage, with total damage estimates of \$927.5 billion.²

Damage to these states has varied depending on the nature of the storm. Hurricane Katrina, for example, was largely a wind and storm surge event. The storm passed quickly, and in its wake pushed water from Lake Pontchartrain north of the city of New Orleans back down south into the canals and bayous surrounding the city, causing a rapid flood event which crested above or broke levees and flood walls within two days. Hurricanes Harvey and Florence, on the other hand, were rain events. Those storms made landfall and stalled in stationary positions for several days, during which time the cities and roadways beneath them were flooded by a combination of rain and rising river levels.

The immediate impact of roadway flooding is the loss of supply to the retail stores that citizens of the U.S. rely on for basic necessities. The U.S. Federal Emergency Management Agency (FEMA) recommends a three day supply of basic necessities.³ However, these recommendations have proven to be less-than-sufficient during recent storms. In New Orleans after hurricane Katrina, supplies to those evacuees in the Superdome and Orleans Parish Convention Center did not arrive for over a week. In Houston after hurricane Harvey made landfall in 2017, the rain did not stop for a week.⁴ In North Carolina after hurricane Florence, river levels rose for a week.⁵

Slow moving, rain heavy storms tend to be the most costly storms, as well. Hurricane Harvey was the most costly on record in terms of property damage, with estimates of \$125 billion in property damage losses.

² NOAA Fast Facts: Weather Disasters & Costs <https://coast.noaa.gov/states/fast-facts/weather-disasters.html>

³ Build A Kit <https://www.ready.gov/build-a-kit>

⁴ Reviewing Harvey's Catastrophic Rain & Flooding <https://www.climate.gov/news-features/event-tracker/reviewing-hurricane-harveys-catastrophic-rain-and-flooding>

⁵ Historic Hurricane Florence <https://www.weather.gov/mhx/Florence2018>

Why Not Satellites or Traffic Data?

Satellite imagery has largely replaced traditional aerial surveying for time-insensitive mapping purposes, but getting imagery on demand at a specific time from a satellite is problematic if cloud cover can restrict the view of the satellite. Appendix C of this document considers the different satellite imagery methodologies and considers “day after” weather reports from the major hurricanes going back to 2005 in the United States for feasibility.⁶

After half of the hurricanes since 2005, cloud cover would have obscured a photographic satellite image. Photographic satellite imagery is also restricted to daylight hours, which further restricts the potential for gathering useful data. While RADAR satellite imagery can see through clouds and is not restricted by the lack of sunlight, it does not produce a human readable image. Logarithmic analysis of RADAR imagery will be required to interpret RADAR satellite data which further restricts the potential audience of such imagery. While more difficult to attain, a geo referenced photographic image is something that everyone can use with the unaided eye for interpretation.

Crowd sourced traffic data is reactionary, in that products such as Google’s Waze and INRIX Research’s traffic data only report road blockages after traffic grinds to a halt. For this reason, the current traffic data offerings are insufficient for reliable determination of road status after a major storm event. While traffic data can tell us where traffic jams occur during mass evacuation efforts, they can’t reliably tell anyone what the status of a road is that drivers have been ordered to avoid. Traffic data monitors people who travel a highway at a speed less than the speed limit, or who sit in a vehicle on a roadway without moving after traffic has ground to a halt. Drivers who venture out on to a highway in an evacuated area after a storm, find flooding or trees blocking roads, and then turn around and go back the way they came from our experience register “no data” surveys back to Waze, for example. By aerial imagery on the other hand, we would see what obstructions in highways are and thus be that much closer to re-opening such highways. A long stretch of highway blocked by a single tree could be prioritized in reports to highway cleanup crews, whereas a highway blocked by a flooded river that has still not crested could be de-prioritized for cleanup and routed around more efficiently.

All of these scenarios begin with having data in hand as quickly as possible. Aerial photography is the most reliable way to gather this data.

⁶ Appendix C: The Day After Each Storm, 2005 - Present

Flying the Roads

In the first appendix of this document we consider the requirements to fly the full length of each primary and secondary road likely to be affected in each hurricane endangered U.S. state. The maps were obtained from U.S. Census data on primary and secondary roads, and U.S. Census data on incorporated places (cities and towns).^{7 8}

We first eliminate roads that are unlikely to be affected. In short, we delete from the calculation the roads on the inland half of each state. Absent mountains or major interstate highways as a dividing line, we use the a line through the first inland major city from the coast as a dividing line. For example in North Carolina we delete roads west of a line through Raleigh/Durham and Fayetteville as unlikely to be forced closed by the storm.⁹ We then measure the remaining roads for a total distance that may be affected by a future storm event.

In our North Carolina example, ten Cessna 182s could fly all of the roads in the storm-affected half of the state approximately ten hours (road data presented in kilometers, and a Cessna 182 can fly comfortably at a speed of 240 kilometers per hour). Contrary to satellite imagery which utilizes a camera on the wrong side of any obscuring clouds, aircraft can fly beneath the lowest cloud layer. Data in the second appendix of this document shows hourly weather readings in the day after each hurricane in the U.S. since 2005, from an airport in the respective storm path.¹⁰ In two-thirds of these storms, satellite photo imagery was impossible to attain after the storm's initial impact due to cloud cover.

In each state's hypothetical scenario, the total area in roads that would be flown to produce a day-one aerial map of flood status measures between 80 and 120 hours of total flight time, which could be accomplished in the respective amount of time divided by the number of aircraft in use. For the calculations in this document, we consider a Cessna 182, which may be acquired and equipped for this purpose for approximately \$150,000 per aircraft, and operated including crew expenses for approximately \$250 per hour.¹¹

⁷ Example: TIGER/Line Shapefile, state, North Carolina, Primary & Secondary Roads <https://catalog.data.gov/dataset/tiger-line-shapefile-2013-state-north-carolina-primary-and-secondary-roads-state-based-shapefile>

⁸ Example: TIGER/Line Shapefile, state, North Carolina, Current Place <https://catalog.data.gov/dataset/tiger-line-shapefile-2013-state-north-carolina-current-place>

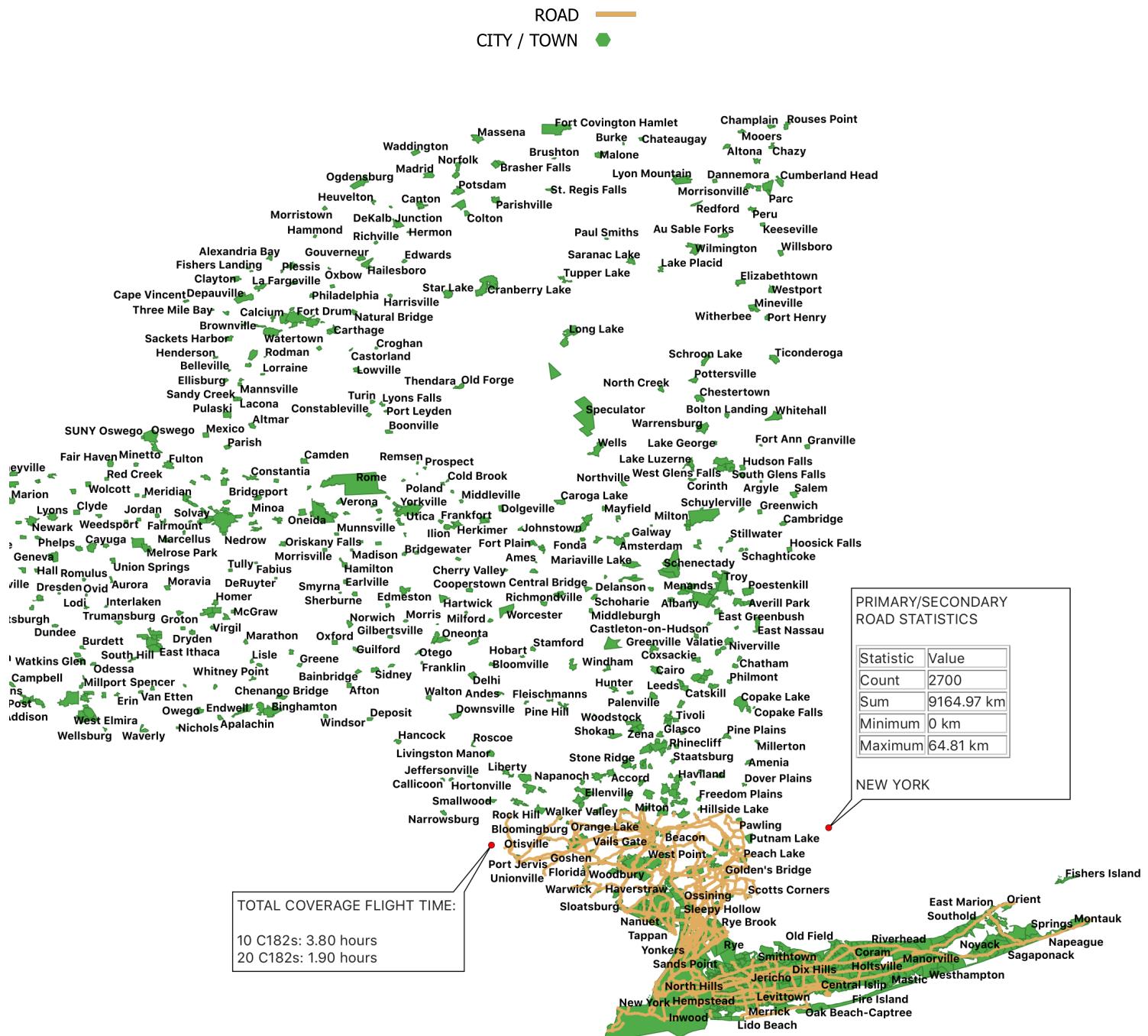
⁹ Appendix A: Hypothetical Affected Roads by State

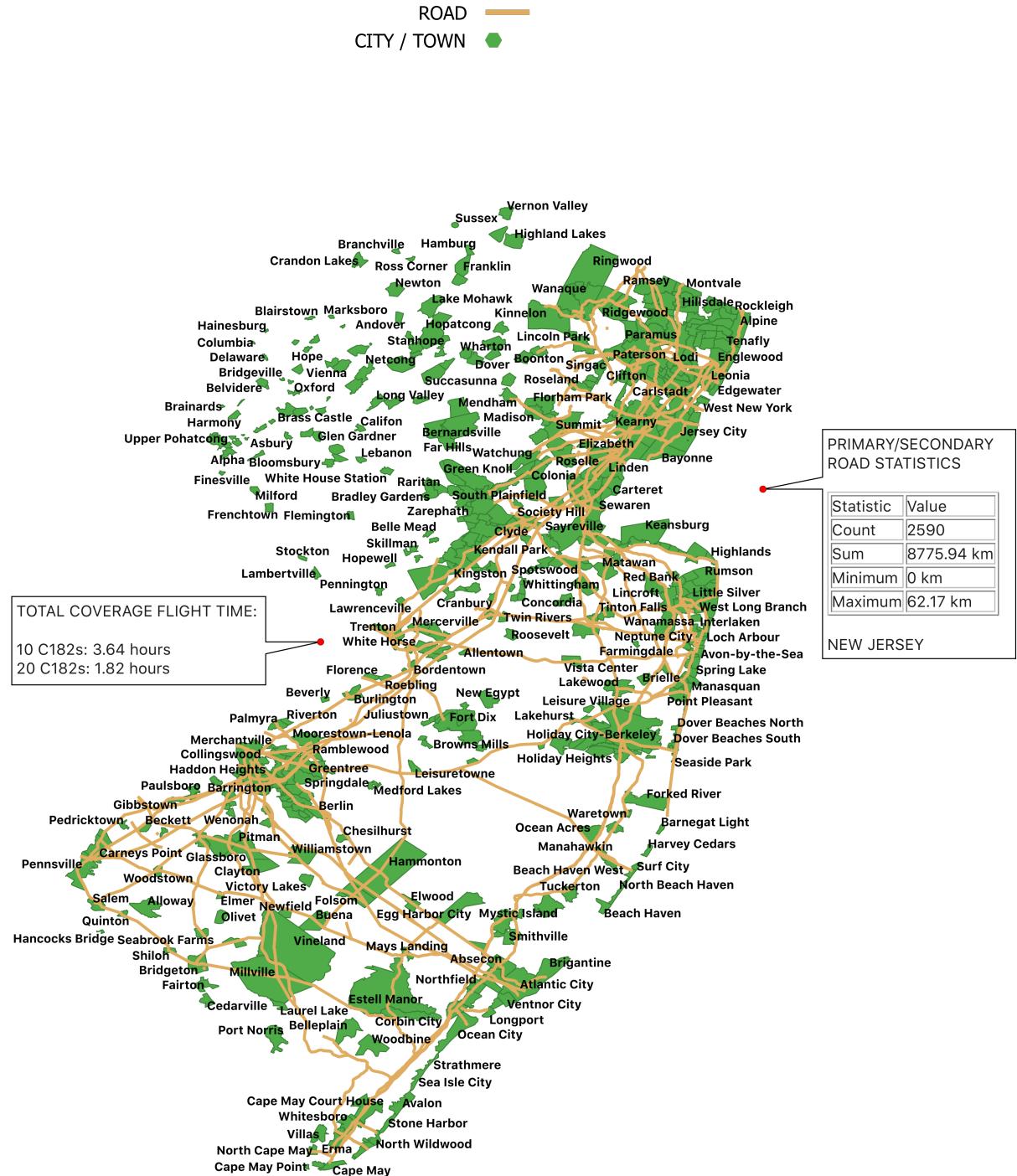
¹⁰ Appendix C: The Day After Each Storm, 2005 - Present

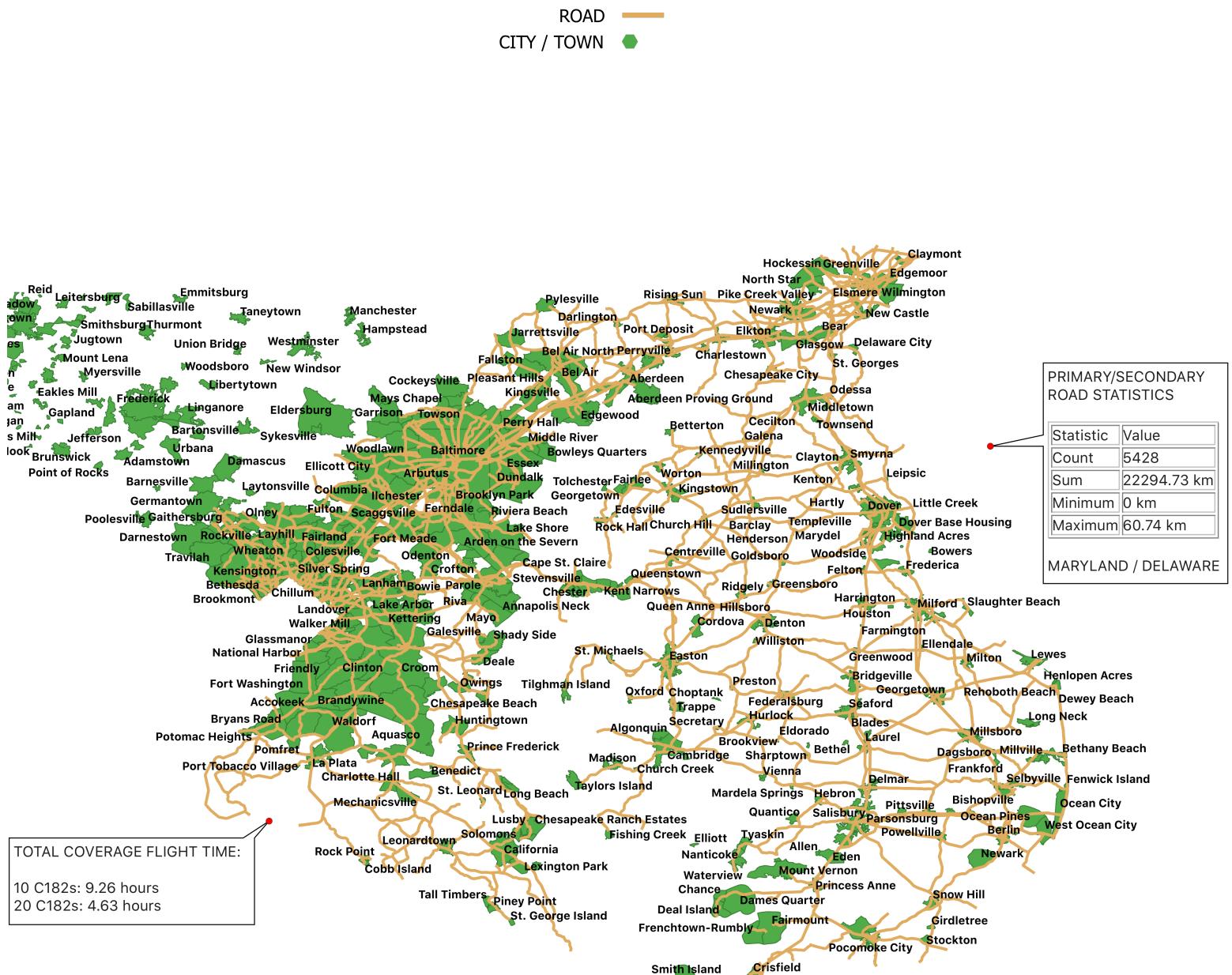
¹¹ Appendix B: Aircraft Cost Analysis: Cessna 182

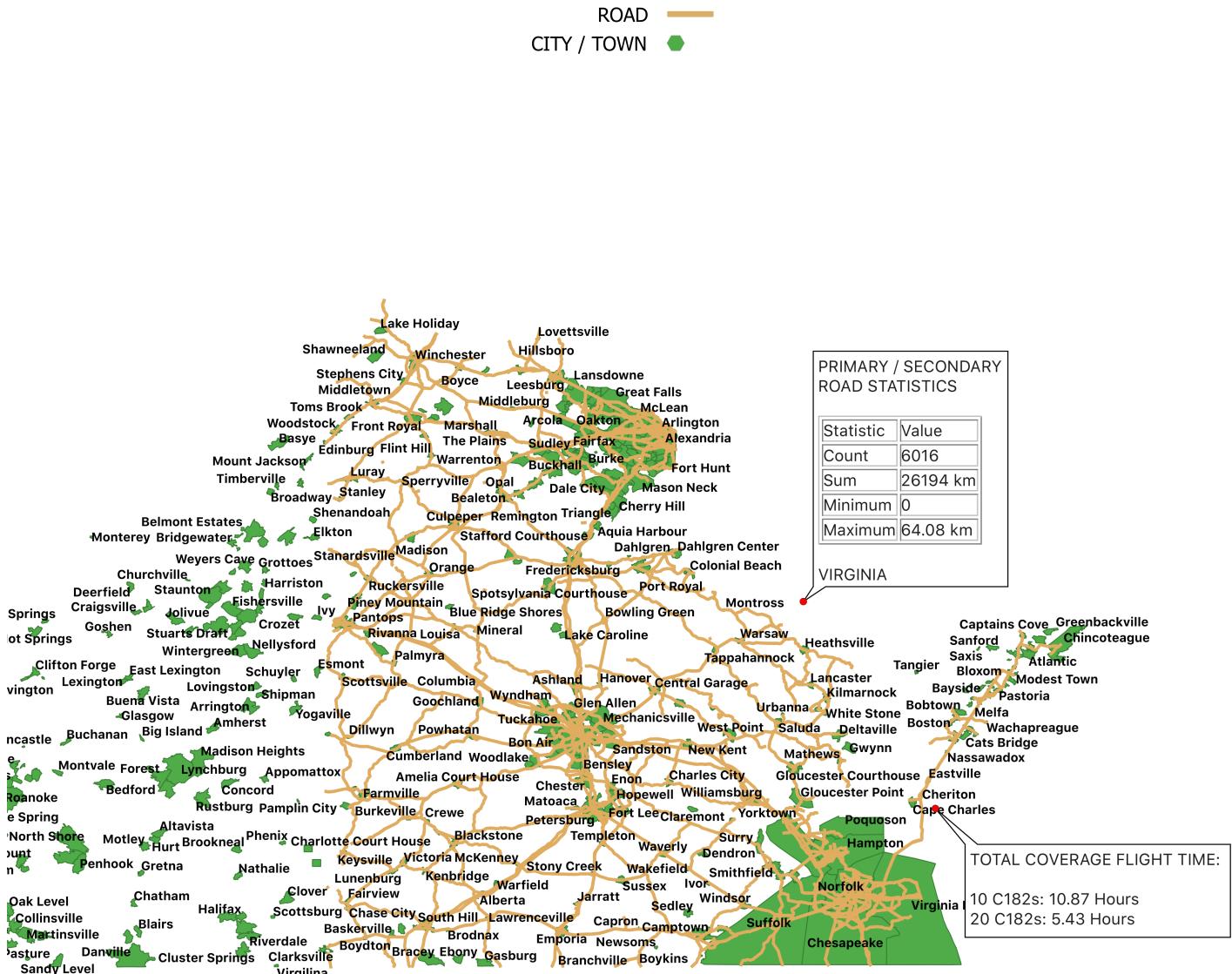
Processing the Data

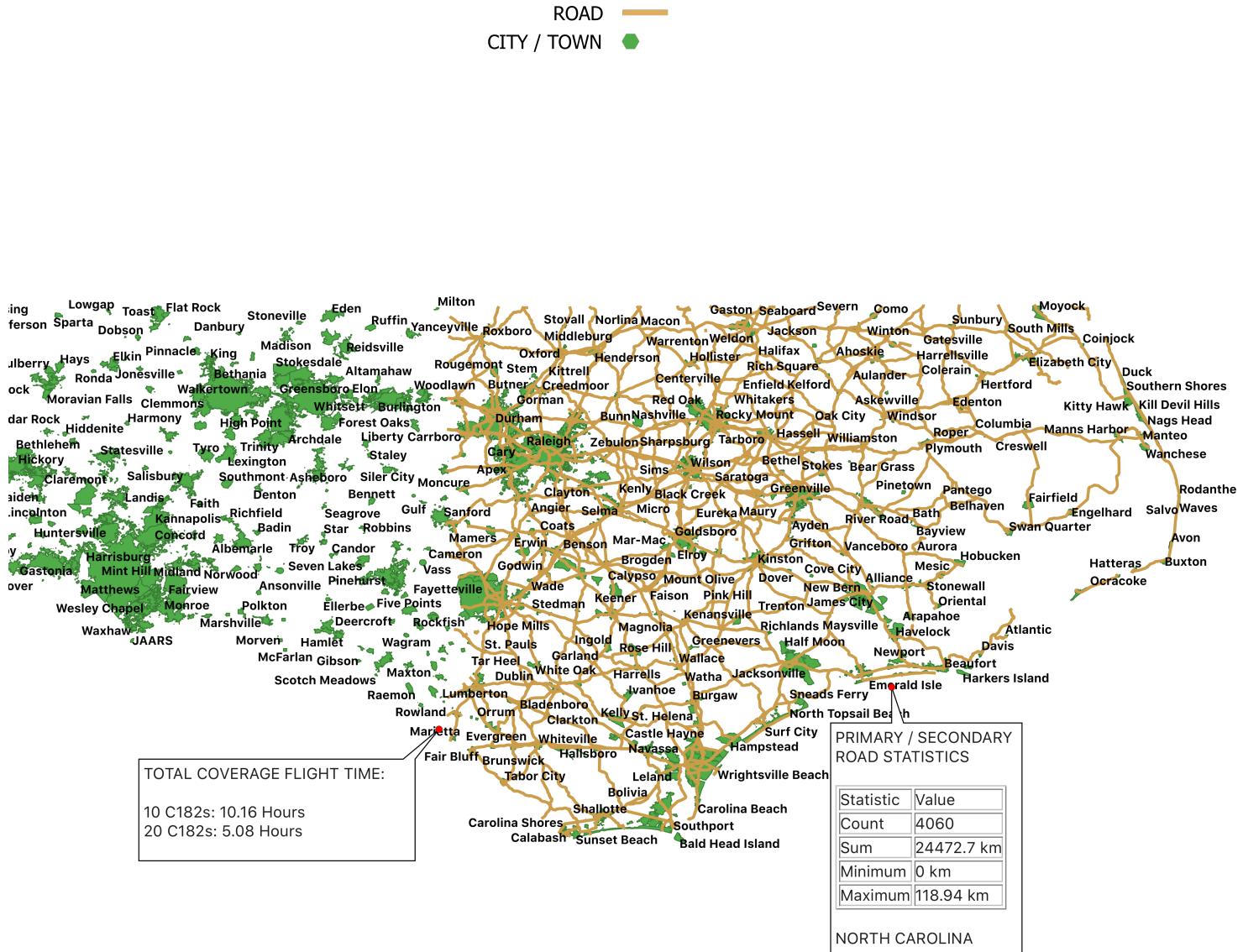
Appendix A: Hypothetical Affected Roads by State

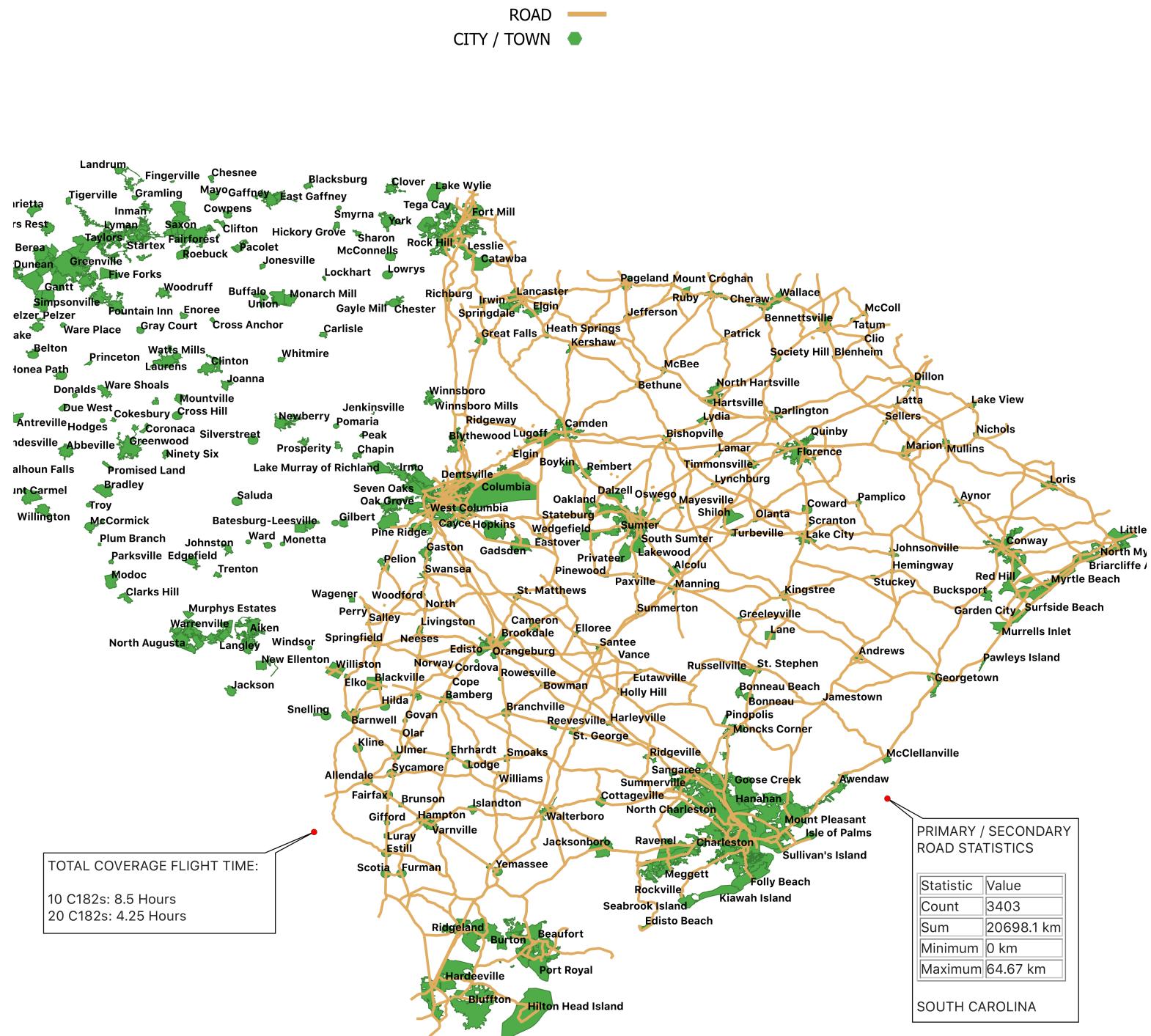


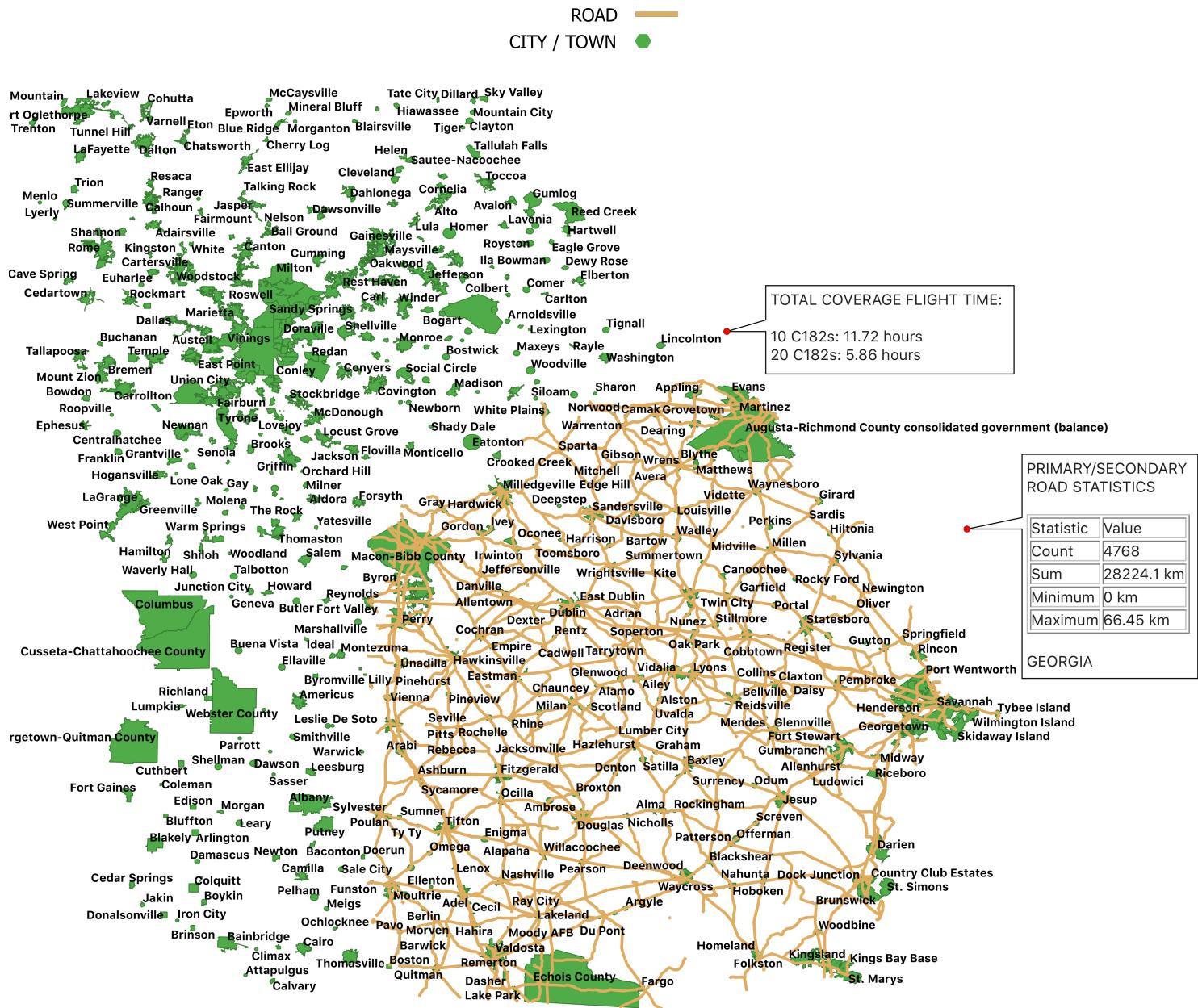


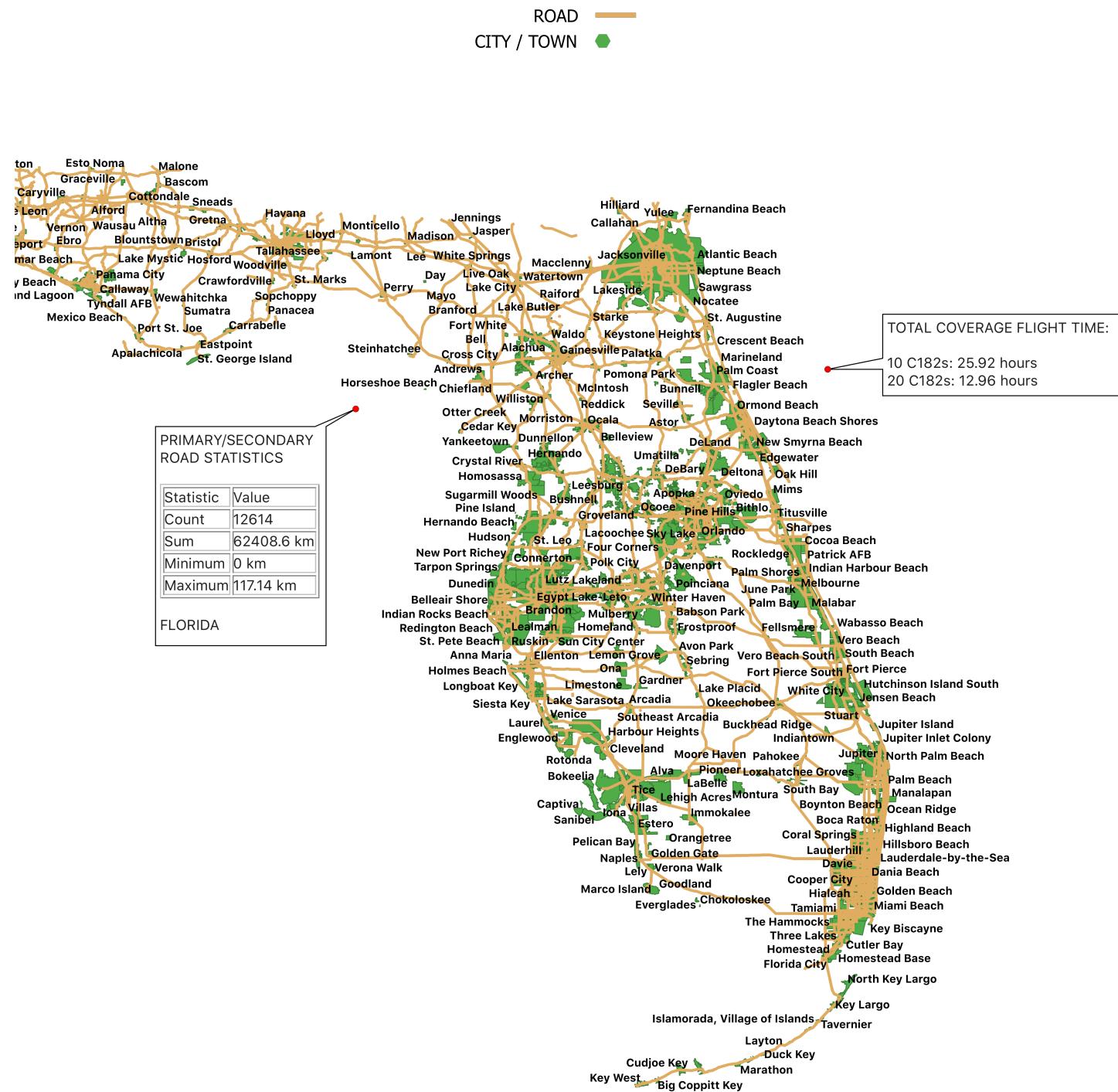


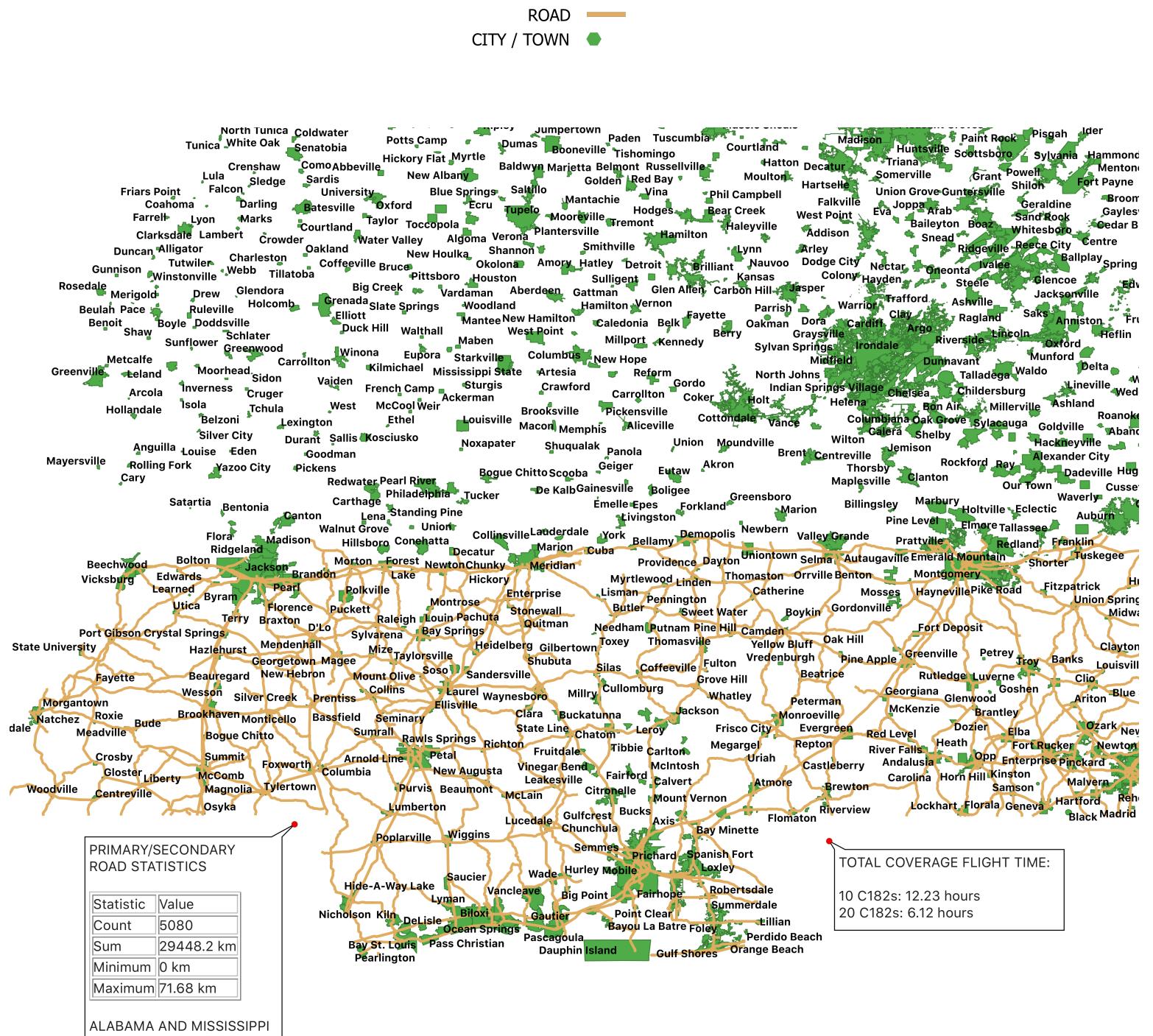


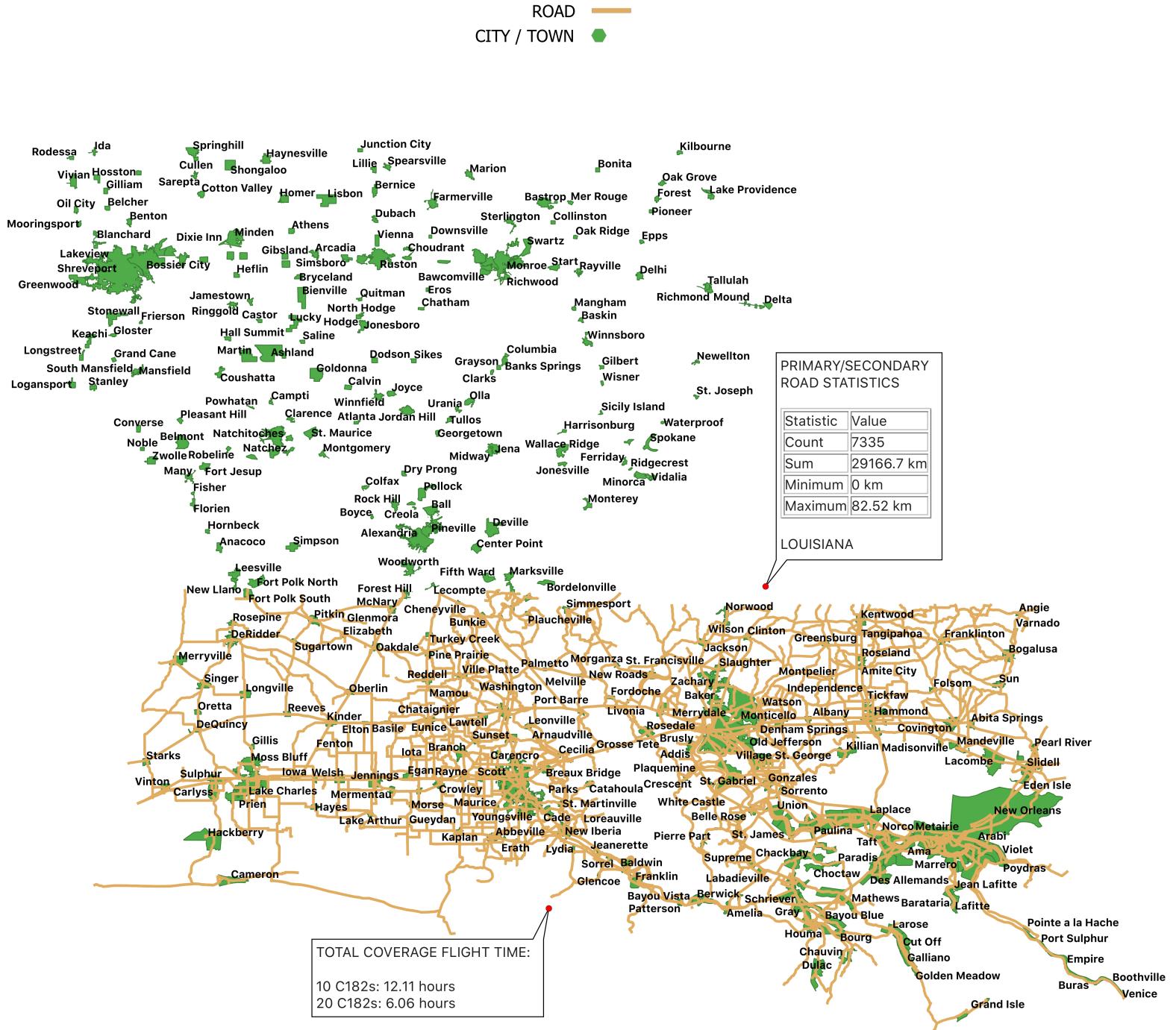


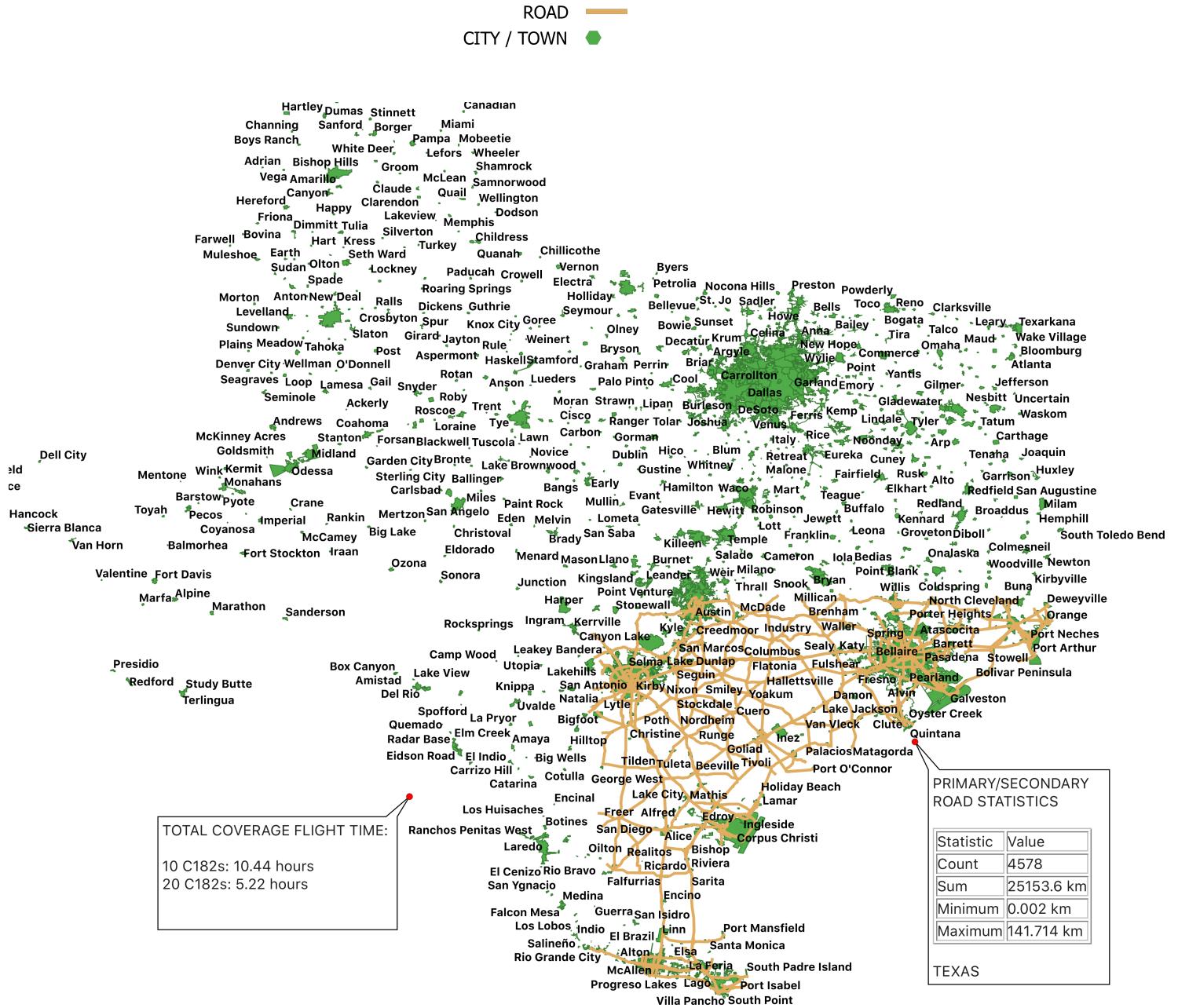












Appendix B: Aircraft Cost Analysis - Cessna 182

We use a piston powered single engine aircraft as a baseline in estimating the cost of this proposal for several reasons, but primarily for cost. Generally, insuring pilots for piston powered light aircraft is similar to car insurance with the exception of one-time make and model specific training. While there are jet turbine powered aircraft that would be a good fit for our mission, any aircraft powered by a jet turbine will have operating costs roughly double that of a comparable piston engine powered aircraft. A significant part of that cost is the insurance requirement for yearly recurrent pilot training for any aircraft powered by a jet turbine.¹² ¹³ Piston single engine pilots on the other hand could be contracted on demand from a large pool of candidates and trained in house for minimal expense. There is also a consideration for field serviceability, since our mission is necessarily far from wherever these aircraft will be based. There are maintenance facilities capable of servicing piston powered aircraft at most municipal airports, with “parts on the shelf” for the most common aircraft like our assumed Cessna 182. Far fewer of those airports have the personnel to service a jet turbine in the event of a mechanical issue. Having to ferry in maintenance personnel and parts from out of town to service a stranded turboprop with a mechanical issue is another expense compounded into an already expensive aircraft, never mind lost time considerations.

Our mission requires aftermarket avionics equipment not commonly found in factory-new or used airplanes for sale. Specifically, we need GPS equipment linked to the aircraft’s autopilot that can be programmed offline to fly custom-programmed routes instead of flying published air routes. We therefore assume the necessity to purchase used aircraft with outdated equipment, and upgrade them to our specifications with contracted avionics work. Beyond the initial acquisition and avionics upgrade costs, each aircraft can be generally assigned a cost per hypothetical flight hour, calculated yearly. This per hour cost figure is a combination of fixed costs such as insurance, mechanical inspections, hangar space, and avionics data subscriptions added to estimated variable costs such as fuel, oil, crew (labor), and reserves for future maintenance such as engine and propeller overhauls. We estimate that a Cessna 182 or similar aircraft will have a base cost of approximately \$250 per hour to operate. A detailed breakdown of this estimate is provided on the following pages.

Our preferred aircraft will be a late 1970s to early 1980s or newer model Cessna 182 with less than 5,000 hours total time in service. The high-wing, strut-reinforced design of this

¹² A sample quote of costs for recurrent training in various turboprop aircraft: <https://archive.is/u0Zch>

¹³ Another sample quote of costs for recurrent training in various turboprop aircraft <https://archive.is/aHJEz>

series of aircraft are preferred by flight schools for their ruggedness, and regularly exceed in-service times of 10,000 hours. At an assumed rate of 200 hours per year for our purposes, a sub-5,000 hour airplane will have at least 20 to 25 years of life left before its age becomes a concern. The first three footnotes on this page are good candidates to consider.^{14 15 16}

In each case, the purchase price reflects a total acquisition cost in the range of \$90,000 to \$120,000 dollars. Typical aircraft purchase contracts are signed “price contingent upon inspection.” allowing the buyer to inspect the airplane to verify airworthy, working condition of all equipment. Any items found to be faulty are repaired during the initial inspection at the seller’s expense, by reducing the purchase price for the cost of repair, so we will assume the asking prices in these three examples to reflect all good, ready-to-fly airplanes for the sake of this example. A breakdown of our total upfront cost for a typical Cessna 182 is shown below.

\$120,000.00	Aircraft purchase price
\$5,000.00	Pre-purchase inspection
\$2,249.00	Garmin G5 Attitude indicator
\$3,075.00	Garmin G5 HSI indicator
\$10,300.00	Garmin GFC500 autopilot with trim and yaw
\$17,000.00	Avidyne IFD540 GPS
\$5,300.00	L3 WX500 stormscope
\$4,749.00	L3 NGT9000R transponder
\$3,595.00	Trig TX56A secondary radio
\$2,095.00	PS Engineering PMA8000G audio panel/intercom
\$5,998.00	EI MVP50P engine computer
\$18,000.00	Installation labor (180 hours @ \$100.00 / hour)
\$2,000.00	Camera and aircraft mounting hardware
\$199,361.00	Total

¹⁴ 1980 Cessna 182Q, asking price \$114,000 <https://archive.is/KJy9U>

¹⁵ 1977 Cessna 182Q, asking price \$99,000 <https://archive.is/OreRB>

¹⁶ 1980 Cessna 182Q, asking price \$90,000 <https://archive.is/4O5Yl>

The estimated cost, spread over the first storm event each year, to operate such a fleet of airplanes for our purposes is as follows:¹⁷

\$24,435.00	Fuel cost per first storm event *
\$600.00	Oil cost per first storm event *
\$5672.00	Engine overhaul reserve cost per first storm event
\$1372.00	Propeller overhaul reserve cost per first storm event
\$15,000.00	Crew salary cost per event
\$3,000.00	Crew per diem cost per event
\$4,800.00	Navigation database subscription cost per year (10 airplanes)
\$30,000.00	Average annual inspection cost per year (10 airplanes)
\$30,000.00	Average annual miscellaneous parts and repairs per year (10 airplanes)
\$30,000.00	Average annual insurance cost per year (10 airplanes)
\$48,000.00	Average hangar rent cost per year (10 airplanes)
\$192,879.00	Total

* The above table assumes 100 hours of total flight time spread among 10 crews of 2 people operating 10 aircraft, and represents the hypothetical first storm of a given year.

Subsequent storm events in a given year will of course represent a lesser cost than the first, as the above figures represent the total annual maintenance estimate, insurance cost, inspection cost, navigation database subscription cost, and hangar cost of the entire fleet. While not covered entirely by the first storm event in a given year, the engine and propeller overhaul cost per event will average lower as total flight hours per year increase. Subsequent storms in a given year would have a total cost to fly approximately \$143,000.00 *less than* the first, or, approximately \$50,000.00 to \$55,000.00 per second through (n)th storm event each year.

¹⁷ Fuel, oil, engine and prop cost data from the What2Fly aircraft operating cost database: http://www.what2fly.com/manufacturer/operating_cost/CESSNA/182+SKYLANE+%2797/726

Appendix C: The Day After Each Storm, 2005 - 2018

For each airport that has an automated weather observation station, readings are distributed worldwide through aviation weather services at least once per hour. Historic data back to the year 2005 exists through a third party government weather data service.¹⁸

The data in this section represents a single nearby airport in the path of every major hurricane that impacted the United States during the years 2005 - 2018, taken every hour on the day *after* the storm made landfall. we consider the data from prior storms since hurricane Katrina in 2005, and find that half of them would have obscured optical satellite data capture in the 24 hour period after the storm's landfall.

METAR data is distributed with teletype abbreviations to maintain compatibility with older aircraft systems that have been in use since the years prior to the internet age. For our purposes, we are primarily looking at cloud cover readings in these reports. Each report has all of the data from a 24 hour period in the day after a hurricane's landfall, from an airport within the hurricane's path near the coast. The translations for the various cloud cover abbreviations in these reports are:

BKN	Cloud layer is "broken." Sky is mostly cloudy, at least 5/8 obscured.
CB	Cumulonimbus (thunderstorm) clouds are present.
CLR	Sky is clear below 12,000 feet.
FEW	Few clouds are present, sky is less than 1/4 obscured.
OVC	Overcast, sky is completely obscured by clouds.
SCT	Scattered clouds, sky is 3/8 to 1/2 obscured by clouds.
SKC	Sky clear. No detected clouds at any altitude.
TCU	Towering Cumulonimbus, severe thunderstorm clouds are present.

The numbers in each report trailing these abbreviations are the altitude in flight level at which the cloud bases are detected. Flight levels are the altitude in feet divided by 100.

We consider based on the above parameters any sky condition other than SKC, CLR, or FEW to be obscured by clouds to the extent that satellite imagery would not provide an accurate picture of road conditions throughout a hurricane impacted area.

¹⁸ OGIMET: <https://www.ogimet.com/home.phtml.en>

Hurricane Dennis: Pensacola, Florida 2005

```
#####
# Query made at 05/27/2019 17:18:09 UTC
# Time interval: from 07/12/2005 01:00 to 07/12/2005 23:59 UTC
#####
# KPNS, Pensacola, Pensacola Regional Airport (United States)
# WMO index: -----
# Latitude 30-28-41N. Longitude 087-11-13W. Altitude 36 m.
#####

#####
# METAR/SPECI from KPNS
#####
200507122353 METAR KPNS 122353Z 19012KT 10SM FEW022 28/24 A3006 RMK AO2
    SLP179 T02830244 10317 20283 51001=
200507122308 SPECI KPNS 122308Z 20012KT 10SM SCT025 BKN030 30/24 A3005
    RMK AO2=
200507122253 METAR KPNS 122253Z 22009KT 10SM FEW023 30/24 A3005 RMK AO2
    SLP178 T03000244=
200507122153 METAR KPNS 122153Z 20011KT 10SM FEW027 31/24 A3006 RMK AO2
    SLP179 T03060239=
200507122053 METAR KPNS 122053Z 20014KT 10SM SCT022 31/24 A3005 RMK AO2
    SLP177 T03060244 58013=
200507121953 METAR KPNS 121953Z 20013KT 10SM CLR 31/24 A3007 RMK AO2 SLP185
    T03110244=
200507121853 METAR KPNS 121853Z 19015KT 10SM SCT022 31/24 A3008 RMK AO2
    SLP185 T03060244=
200507121753 METAR KPNS 121753Z 18011KT 160V220 10SM CLR 31/25 A3009 RMK
    AO2 SLP190 T03060250 10311 20267
    58002=
200507121653 METAR KPNS 121653Z COR 17013KT 10SM SCT022 31/25 A3011 RMK
    AO2 SLP195 T03110250 TSN0=
200507121553 METAR KPNS 121553Z 18010KT 10SM SCT024 SCT030 31/25 A3011
    RMK AO2 SLP196 T03060250=
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    RMK AO2 SLP192 T03000228 50005=
200507121353 METAR KPNS 121353Z 25007KT 10SM FEW017 SCT027 BKN032 29/24
    A3010 RMK AO2 SLP194 T02890244=
200507121316 SPECI KPNS 121316Z 24006KT 10SM BKN015 BKN022 28/25 A3010
    RMK AO2=
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    SLP191 T02780250=
```

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200507121153 METAR KPNS 121153Z 20004KT 9SM FEW007 27/26 A3008 RMK AO2
SLP187 T02670256 10267 20261 53017=
200507121053 METAR KPNS 121053Z AUTO 21004KT 9SM SCT009 26/25 A3007 RMK
AO2 SLP182 T02610250=
200507121016 SPECI KPNS 121016Z AUTO 20005KT 10SM FEW008 26/25 A3005 RMK
AO2=
200507120953 METAR KPNS 120953Z AUTO 20006KT 10SM SCT010 SCT024 26/25
A3004 RMK AO2 SLP175 T02610250=
200507120925 SPECI KPNS 120925Z AUTO 21006KT 10SM FEW008 SCT014 26/25
A3004 RMK AO2=
200507120917 SPECI KPNS 120917Z AUTO 21007KT 10SM SCT008 BKN012 27/25
A3004 RMK AO2=
200507120903 SPECI KPNS 120903Z AUTO 20006KT 10SM BKN008 BKN014 OVC025
27/26 A3004 RMK AO2 CIG 006V012=
200507120853 METAR KPNS 120853Z AUTO 19006KT 10SM SCT008 BKN015 BKN025
27/26 A3003 RMK AO2 SLP171 T02670256
56001=
200507120845 SPECI KPNS 120845Z AUTO 18005KT 10SM SCT008 BKN015 OVC026
27/26 A3003 RMK AO2=
200507120753 METAR KPNS 120753Z AUTO 19007KT 10SM BKN010 BKN015 26/25
A3003 RMK AO2 CIG 006V013 SLP171
T02610250=
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RMK AO2 CIG 006V010=
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RMK AO2 SLP168 T02610250=
200507120612 SPECI KPNS 120612Z AUTO 17007KT 10SM SCT009 SCT017 26/25
A3003 RMK AO2=
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20261 403170239 52005=
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A3004 RMK AO2=
200507120453 METAR KPNS 120453Z AUTO 15006KT 10SM SCT008 26/25 A3003 RMK
AO2 SLP170 T02610250=
200507120353 METAR KPNS 120353Z AUTO 18005KT 10SM FEW010 26/25 A3002 RMK
AO2 SLP167 T02610250=
200507120253 METAR KPNS 120253Z AUTO 20006KT 10SM SCT010 27/25 A3002 RMK
AO2 SLP166 T02670250 53021=
200507120153 METAR KPNS 120153Z AUTO 19007KT 10SM CLR 27/24 A3000 RMK
AO2 SLP158 T02670244=

Hurricane Katrina: Baton Rouge, Louisiana 2005

```
#####
# Query made at 05/27/2019 17:49:16 UTC
# Time interval: from 08/30/2005 01:00 to 08/30/2005 23:59 UTC
#####
# KBTR, Baton Rouge, Baton Rouge Metropolitan, Ryan Field (United States)
# WMO index: -----
# Latitude 30-32-14N. Longitude 091-08-49W. Altitude 21 m.
#####

#####
# METAR/SPECI from KBTR
#####
200508302353 METAR KBTR 302353Z AUTO 27003KT 10SM CLR 31/22 A2974 RMK
    AO2 SLP068 T03110222 10333 20311
    53003 TSNO=-
200508302053 METAR KBTR 302053Z AUTO 24006KT 10SM CLR 33/22 A2973 RMK
    AO2 SLP065 T03280217 57014 TSNO=-
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    AO2 SLP069 T03220222 TSNO=-
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    AO2 SLP075 T03220222 TSNO=-
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    AO2 SLP079 T03170217 10317 20222
    50001 TSNO=-
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    AO2 SLP082 T03060200 TSNO=-
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    AO2 SLP078 T02940211 51018 TSNO=-
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    AO2 SLP069 T02440217 TSNO=-
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    AO2 SLP062 60000 70161 T02280211
    10250 20222 53015 TSNO=-
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    AO2 RAB43E50 SLP057 P0000 T02280211
    TSNO=-
200508300953 METAR KBTR 300953Z AUTO 28003KT 10SM CLR 23/21 A2968 RMK
    AO2 RAB16E26B42E50 SLP048 P0000 T02330211
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TSNO=

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AO2 SLP046 60000 T02330211 53016

TSNO=

200508300753 METAR KBTR 300753Z AUTO 26004KT 10SM CLR 24/21 A2965 RMK

AO2 SLP038 T02390211 TSNO=

200508300653 METAR KBTR 300653Z AUTO 26007KT 10SM CLR 24/21 A2962 RMK

AO2 RAB40E49 SLP030 P0000 T02440211

TSNO=

200508300553 METAR KBTR 300553Z AUTO 24009KT 10SM CLR 25/21 A2962 RMK

AO2 SLP030 T02500211 10272 20244

402720239 51018 TSNO=

200508300453 METAR KBTR 300453Z AUTO 23006KT 10SM FEW045 24/21 A2961 RMK

AO2 SLP027 T02440211 TSNO=

Hurricane Rita: Beaumont, Texas 2005

```
#####
# Query made at 05/27/2019 17:59:16 UTC
# Time interval: from 09/25/2005 01:00 to 09/25/2005 23:59 UTC
#####
#####
```

#####
KBTP, Butler County Automatic Weather Observing / Reporting System (United States)
WMO index: -----
Latitude 40-47N. Longitude 079-57W. Altitude 380 m.
#####
#####

#####
METAR/SPECI from KBTP
#####
200509252355 METAR KBTP 252355Z AUTO 00000KT 10SM FEW060 23/19 A3003 RMK
 AO1 10280 20230 402800160=
200509252335 METAR KBTP 252335Z AUTO 00000KT 10SM CLR 24/18 A3003 RMK
 AO1=
200509252315 METAR KBTP 252315Z AUTO 00000KT 10SM CLR 25/18 A3004 RMK
 AO1=
200509252255 METAR KBTP 252255Z AUTO 00000KT 10SM CLR 24/19 A3004 RMK
 AO1=
200509252235 METAR KBTP 252235Z AUTO 00000KT 10SM CLR 25/19 A3004 RMK
 AO1=
200509252215 METAR KBTP 252215Z AUTO 00000KT 10SM CLR 26/19 A3004 RMK
 AO1=
200509252155 METAR KBTP 252155Z AUTO 00000KT 10SM CLR 27/19 A3004 RMK
 AO1 57020=
200509252135 METAR KBTP 252135Z AUTO 00000KT 10SM CLR 27/18 A3004 RMK
 AO1=
200509252115 METAR KBTP 252115Z AUTO 00000KT 10SM CLR 27/18 A3005 RMK
 AO1=
200509252055 METAR KBTP 252055Z AUTO 00000KT 10SM CLR 27/18 A3005 RMK
 AO1=
200509252035 METAR KBTP 252035Z AUTO 16003KT 9SM CLR 27/18 A3006 RMK AO1=
200509252015 METAR KBTP 252015Z AUTO 19003KT 10SM CLR 28/18 A3007 RMK
 AO1=
200509251955 METAR KBTP 251955Z AUTO 21003KT 10SM CLR 28/18 A3008 RMK
 AO1=
200509251935 METAR KBTP 251935Z AUTO 17005KT 9SM CLR 28/18 A3009 RMK AO1=
200509251915 METAR KBTP 251915Z AUTO 23004KT 10SM CLR 28/19 A3010 RMK
 AO1=
200509251855 METAR KBTP 251855Z AUTO 20004KT 10SM CLR 28/18 A3010 RMK

AO1 57027=

200509251835 METAR KBTP 251835Z AUTO 24005KT 8SM CLR 28/19 A3011 RMK AO1=

200509251815 METAR KBTP 251815Z AUTO 23004KT 8SM CLR 28/19 A3012 RMK AO1=

200509251755 METAR KBTP 251755Z AUTO 25007KT 10SM CLR 27/19 A3014 RMK

AO1 10270 20160=

200509251735 METAR KBTP 251735Z AUTO 25007KT 9SM CLR 27/18 A3015 RMK AO1=

200509251715 METAR KBTP 251715Z AUTO 00000KT 9SM CLR 26/19 A3015 RMK AO1=

200509251655 METAR KBTP 251655Z AUTO 19003KT 10SM CLR 25/18 A3016 RMK

AO1=

200509251635 METAR KBTP 251635Z AUTO 00000KT 9SM CLR 25/18 A3017 RMK AO1=

200509251615 METAR KBTP 251615Z AUTO 21004KT 9SM CLR 24/18 A3018 RMK AO1=

200509251555 METAR KBTP 251555Z AUTO 00000KT 8SM CLR 23/18 A3018 RMK AO1

57007=

200509251535 METAR KBTP 251535Z AUTO 19003KT 10SM CLR 22/17 A3018 RMK

AO1=

200509251515 METAR KBTP 251515Z AUTO 00000KT 10SM CLR 22/17 A3019 RMK

AO1=

200509251455 METAR KBTP 251455Z AUTO 00000KT 10SM CLR 22/17 A3019 RMK

AO1=

200509251435 METAR KBTP 251435Z AUTO 18004KT 10SM CLR 21/16 A3019 RMK

AO1=

200509251415 METAR KBTP 251415Z AUTO 18003KT 10SM CLR 21/16 A3020 RMK

AO1=

200509251355 METAR KBTP 251355Z AUTO 00000KT 10SM CLR 19/16 A3020 RMK

AO1=

200509251335 METAR KBTP 251335Z AUTO 00000KT 10SM CLR 19/16 A3020 RMK

AO1=

200509251315 METAR KBTP 251315Z AUTO 17004KT 10SM CLR 18/16 A3020 RMK

AO1=

200509251255 METAR KBTP 251255Z AUTO 14003KT 10SM CLR 17/15 A3020 RMK

AO1 54000=

200509251235 METAR KBTP 251235Z AUTO 00000KT 10SM CLR 17/14 A3020 RMK

AO1=

200509251215 METAR KBTP 251215Z AUTO 14003KT 10SM CLR 17/14 A3021 RMK

AO1=

200509251155 METAR KBTP 251155Z AUTO 13003KT 10SM CLR 16/14 A3020 RMK

AO1 10160 20160=

200509251135 METAR KBTP 251135Z AUTO 00000KT 10SM CLR 16/14 A3021 RMK

AO1=

200509251115 METAR KBTP 251115Z AUTO 00000KT 10SM CLR 16/14 A3020 RMK

AO1=

200509251055 METAR KBTP 251055Z AUTO 12003KT 10SM CLR 16/14 A3020 RMK

AO1=

200509251035 METAR KBTP 251035Z AUTO 13003KT 10SM FEW090 16/14 A3020 RMK

AO1=

200509251015 METAR KBTP 251015Z AUTO 13003KT 10SM CLR 16/13 A3020 RMK
AO1=

200509250955 METAR KBTP 250955Z AUTO 00000KT 10SM CLR 16/13 A3020 RMK
AO1 52003=

200509250935 METAR KBTP 250935Z AUTO 12003KT 10SM CLR 16/13 A3019 RMK
AO1=

200509250915 METAR KBTP 250915Z AUTO 13003KT 10SM CLR 16/13 A3020 RMK
AO1=

200509250855 METAR KBTP 250855Z AUTO 00000KT 10SM CLR 16/13 A3020 RMK
AO1=

200509250835 METAR KBTP 250835Z AUTO 13003KT 10SM CLR 16/13 A3019 RMK
AO1=

200509250815 METAR KBTP 250815Z AUTO 13003KT 10SM CLR 16/13 A3019 RMK
AO1=

200509250755 METAR KBTP 250755Z AUTO 13003KT 10SM CLR 16/13 A3019 RMK
AO1=

200509250735 METAR KBTP 250735Z AUTO 13003KT 10SM CLR 16/13 A3019 RMK
AO1=

200509250715 METAR KBTP 250715Z AUTO 12004KT 10SM CLR 16/13 A3019 RMK
AO1=

200509250655 METAR KBTP 250655Z AUTO 13003KT 10SM CLR 16/13 A3019 RMK
AO1 57007=

200509250635 METAR KBTP 250635Z AUTO 13003KT 10SM CLR 16/13 A3020 RMK
AO1=

200509250615 METAR KBTP 250615Z AUTO 13004KT 10SM CLR 16/13 A3019 RMK
AO1=

200509250555 METAR KBTP 250555Z AUTO 14003KT 10SM CLR 16/13 A3020 RMK
AO1 10190 20160=

200509250535 METAR KBTP 250535Z AUTO 13004KT 10SM CLR 16/13 A3020 RMK
AO1=

200509250515 METAR KBTP 250515Z AUTO 12003KT 10SM CLR 16/13 A3020 RMK
AO1=

200509250455 METAR KBTP 250455Z AUTO 13005KT 10SM CLR 16/13 A3021 RMK
AO1=

200509250435 METAR KBTP 250435Z AUTO 13003KT 10SM CLR 16/12 A3021 RMK
AO1=

200509250415 METAR KBTP 250415Z AUTO 14003KT 10SM CLR 17/12 A3021 RMK
AO1=

200509250355 METAR KBTP 250355Z AUTO 12004KT 10SM CLR 17/12 A3021 RMK
AO1 54000=

200509250335 METAR KBTP 250335Z AUTO 13005KT 10SM CLR 17/12 A3022 RMK
AO1=

200509250315 METAR KBTP 250315Z AUTO 12004KT 10SM CLR 17/12 A3022 RMK
AO1=

200509250255 METAR KBTP 250255Z AUTO 12006KT 10SM CLR 17/12 A3021 RMK

AO1=

200509250235 METAR KBTP 250235Z AUTO 12005KT 10SM FEW049 17/13 A3022 RMK

AO1=

200509250215 METAR KBTP 250215Z AUTO 12006KT 10SM FEW049 17/13 A3021 RMK

AO1=

200509250155 METAR KBTP 250155Z AUTO 10004KT 10SM CLR 18/13 A3022 RMK

AO1=

200509250135 METAR KBTP 250135Z AUTO 11003KT 10SM CLR 18/13 A3022 RMK

AO1=

200509250115 METAR KBTP 250115Z AUTO 10004KT 10SM CLR 18/13 A3021 RMK

AO1=

Hurricane Wilma: Miami, Florida 2005

```
#####
# Query made at 05/27/2019 20:06:30 UTC
# Time interval: from 10/25/2005 01:00 to 10/25/2005 23:59 UTC
#####
# KMIA, Miami, Fl (United States)
# WMO index: 72202
# Latitude 25-45-16N. Longitude 080-22-59W. Altitude 4 m.
#####

#####
# METAR/SPECI from KMIA
#####
200510252353 METAR KMIA 252353Z 31005KT 10SM CLR 19/11 A3000 RMK AO2 SLP157
    T01940111 10217 20194 53016=
200510252253 METAR KMIA 252253Z 30006KT 10SM FEW045 20/10 A2998 RMK AO2
    SLP150 T02000100=
200510252153 METAR KMIA 252153Z 29011KT 10SM FEW045 21/09 A2996 RMK AO2
    SLP144 T02110094=
200510252053 METAR KMIA 252053Z 29012G19KT 10SM FEW045 22/10 A2995 RMK
    AO2 SLP141 T02170100 55007=
200510252023 SPECI KMIA 252023Z 30010G15KT 250V340 10SM SCT043 21/10 A2995
    RMK AO2 ASOS AUGMENTATION AND BACK-UP
    IS BEING RESUMED=
200510251953 METAR KMIA 251953Z AUTO 27010G15KT 10SM FEW044 21/10 A2994
    RMK AO2 SLP139 T02110100 TSNO=
200510251853 METAR KMIA 251853Z AUTO 31010KT 10SM CLR 21/09 A2996 RMK
    AO2 SLP144 T02060094 TSNO=
200510251753 METAR KMIA 251753Z AUTO 33009KT 10SM CLR 21/10 A2997 RMK
    AO2 SLP148 T02060100 10211 20144
    58016 TSNO=
200510251653 METAR KMIA 251653Z AUTO 30010KT 10SM CLR 21/10 A2999 RMK
    AO2 SLP155 T02060100 TSNO=
200510251553 METAR KMIA 251553Z AUTO 33009KT 10SM CLR 19/08 A3001 RMK
    AO2 SLP161 T01940083 TSNO=
200510251453 METAR KMIA 251453Z AUTO 32010KT 10SM CLR 18/08 A3001 RMK
    AO2 SLP163 T01830078 51019 TSNO=
200510251353 METAR KMIA 251353Z AUTO 32010KT 10SM CLR 17/06 A3000 RMK
    AO2 SLP158 T01670061 TSNO=
200510251253 METAR KMIA 251253Z AUTO 34008KT 10SM CLR 16/06 A2998 RMK
    AO2 SLP151 T01560056 TSNO=
200510251153 METAR KMIA 251153Z AUTO 33005KT 10SM CLR 14/06 A2996 RMK
```

AO2 SLP145 70044 T01440056 10183
20144 51018 TSNO=

200510251053 METAR KMIA 251053Z AUTO 33007KT 10SM CLR 14/05 A2994 RMK
AO2 SLP140 T01440050 TSNO=

200510250953 METAR KMIA 250953Z AUTO 34008KT 10SM CLR 15/05 A2992 RMK
AO2 SLP133 T01500050 TSNO \$=

200510250853 METAR KMIA 250853Z AUTO 33010KT 290V350 10SM CLR 16/06 A2991
RMK AO2 SLP127 T01560056 53012 TSNO
\$=

200510250753 METAR KMIA 250753Z AUTO 32007KT 10SM CLR 17/06 A2989 RMK
AO2 SLP122 T01670056 TSNO \$=

200510250653 METAR KMIA 250653Z AUTO 31007G16KT 10SM CLR 17/04 A2987 RMK
AO2 SLP116 T01720044 TSNO \$=

200510250553 METAR KMIA 250553Z AUTO 31010KT 10SM CLR 18/05 A2987 RMK
AO2 SLP115 T01830050 10217 20183
51019 TSNO \$=

200510250453 METAR KMIA 250453Z AUTO 31014G19KT 10SM CLR 19/06 A2986 RMK
AO2 SLP110 T01890061 402830189 TSNO
\$=

200510250353 METAR KMIA 250353Z AUTO 32011G20KT 10SM CLR 19/09 A2984 RMK
AO2 SLP104 T01940089 TSNO \$=

200510250253 METAR KMIA 250253Z AUTO 30014G24KT 10SM CLR 20/11 A2982 RMK
AO2 SLP097 T02000106 51035 TSNO \$=

200510250153 METAR KMIA 250153Z AUTO 29013G23KT 10SM CLR 21/13 A2979 RMK
AO2 SLP087 T02110133 TSNO \$=

Hurricane Dolly: Padre Island, Texas 2008

```
#####
# Query made at 05/27/2019 20:44:09 UTC
# Time interval: from 07/24/2008 01:00 to 07/24/2008 23:59 UTC
#####

#####
# KBRO, Brownsville, Brownsville / South Padre Island International Airport (United States)
# WMO index: 72250
# Latitude 25-54-51N. Longitude 097-25-23W. Altitude 7 m.
#####

#####
# METAR/SPECI from KBRO
#####
200807242353 METAR KBRO 242353Z AUTO 14014KT 10SM SCT018 BKN023 BKN040
               29/26 A2988 RMK AO2 SLP116 T02890261
               10311 20289 53003 TSNO=
```

```
200807242326 SPECI KBRO 242326Z AUTO 16013G21KT 10SM SCT018 BKN025 29/26
               A2987 RMK AO2 TSNO=
```

```
200807242253 METAR KBRO 242253Z AUTO 16019G24KT 10SM SCT021 30/26 A2986
               RMK AO2 PK WND 15026/2204 SLP109
               T03000256 TSNO=
```

```
200807242219 SPECI KBRO 242219Z AUTO 16019G25KT 10SM SCT021 SCT027 31/26
               A2985 RMK AO2 PK WND 15026/2204 TSNO=
```

```
200807242153 METAR KBRO 242153Z AUTO 15019G25KT 10SM SCT021 BKN027 30/26
               A2986 RMK AO2 PK WND 17026/2111 SLP109
               T03000256 TSNO=
```

```
200807242132 SPECI KBRO 242132Z AUTO 16015KT 10SM FEW023 SCT033 31/26
               A2986 RMK AO2 PK WND 17026/2111 TSNO=
```

```
200807242103 SPECI KBRO 242103Z AUTO 16020G23KT 10SM BKN023 BKN029 31/26
               A2987 RMK AO2 TSNO=
```

```
200807242053 METAR KBRO 242053Z AUTO 16018KT 10SM SCT023 SCT029 31/26
               A2987 RMK AO2 PK WND 16027/2007 SLP113
               T03060256 58005 TSNO=
```

```
200807241953 METAR KBRO 241953Z AUTO 17017G25KT 10SM FEW033 30/25 A2988
               RMK AO2 PK WND 15027/1911 SLP115
               T03000250 TSNO=
```

```
200807241853 METAR KBRO 241853Z AUTO 15021KT 10SM CLR 31/25 A2988 RMK
               AO2 PK WND 17028/1816 SLP116 T03060250
               TSNO=
```

```
200807241753 METAR KBRO 241753Z AUTO 16019G25KT 10SM FEW023 SCT032 BKN042
               31/26 A2988 RMK AO2 PK WND 16029/1716
               SLP118 T03060256 10306 20267 50007
```

TSNO=

200807241716 SPECI KBRO 241716Z AUTO 16024G29KT 10SM SCT021 BKN033 BKN041
30/25 A2988 RMK AO2 PK WND 16029/1716

TSNO=

200807241653 METAR KBRO 241653Z AUTO 16024G29KT 10SM BKN021 BKN026 BKN034
30/25 A2988 RMK AO2 PK WND 15029/1653
SLP118 T03000250 TSNO=

200807241553 METAR KBRO 241553Z AUTO 16020G27KT 10SM BKN020 29/25 A2987
RMK AO2 PK WND 15027/1550 SLP113
T02890250 TSNO=

200807241539 SPECI KBRO 241539Z AUTO 16018G25KT 10SM BKN018 BKN024 29/26
A2987 RMK AO2 PK WND 16026/1526 TSNO=

200807241453 METAR KBRO 241453Z AUTO 16017KT 9SM CLR 28/26 A2986 RMK AO2
SLP111 T02780256 53021 TSNO=

200807241353 METAR KBRO 241353Z AUTO 16015G20KT 10SM CLR 27/26 A2984 RMK
AO2 SLP103 T02720256 TSNO=

200807241344 SPECI KBRO 241344Z AUTO 16016KT 10SM FEW019 27/26 A2984 RMK
AO2 TSNO=

200807241323 SPECI KBRO 241323Z AUTO 16013KT 10SM BKN017 27/25 A2983 RMK
AO2 TSNO=

200807241253 METAR KBRO 241253Z AUTO 16012KT 10SM CLR 27/25 A2981 RMK
AO2 SLP093 T02670250 TSNO=

200807241205 SPECI KBRO 241205Z AUTO 17010KT 10SM SCT010 27/25 A2980 RMK
AO2 TSNO \$=

200807241153 METAR KBRO 241153Z AUTO 17009KT 10SM BKN010 27/25 A2980 RMK
AO2 RAE1055 CIG 007V013 SLP090 P0000
60006 70568 T02670250 10267 20250
51020 TSNO \$=

200807241112 SPECI KBRO 241112Z AUTO 18010KT 10SM BKN010 OVC100 26/25
A2979 RMK AO2 RAE1055 CIG 007V013
P0000 TSNO \$=

200807241053 METAR KBRO 241053Z AUTO 18010KT 10SM -RA BKN008 OVC100 26/25
A2979 RMK AO2 RAE02B45 SLP087 P0000
T02610250 TSNO \$=

200807241043 SPECI KBRO 241043Z AUTO 21009KT 10SM BKN008 OVC100 26/25
A2979 RMK AO2 RAE02 P0000 TSNO \$=

200807240953 METAR KBRO 240953Z AUTO 17017KT 10SM -RA BKN090 BKN110 26/24
A2976 RMK AO2 PK WND 18026/0902 RAB50
SLP078 P0000 T02610244 TSNO \$=

200807240853 METAR KBRO 240853Z AUTO 18019G25KT 10SM BKN075 BKN110 26/24
A2974 RMK AO2 PK WND 18028/0821 SLP070
60006 T02610244 53013 TSNO \$=

200807240810 SPECI KBRO 240810Z AUTO 18019G27KT 10SM SCT013 BKN065 26/24
A2973 RMK AO2 PK WND 17027/0805 TSNO
\$=

200807240753 METAR KBRO 240753Z AUTO 18016G24KT 10SM BKN013 OVC065 26/24

A2973 RMK AO2 RAE32 SLP065 P0001

T02610244 TSNO \$=

200807240724 SPECI KBRO 240724Z AUTO 19013KT 10SM -RA BKN013 OVC055 26/24

A2972 RMK AO2 P0001 TSNO \$=

200807240653 METAR KBRO 240653Z AUTO 18017KT 10SM -RA FEW047 BKN060 OVC075

25/24 A2971 RMK AO2 PK WND 19028/0609

SLP060 P0005 T02500239 TSNO \$=

200807240353 METAR KBRO 240353Z AUTO 18030G39KT 6SM BR OVC020 24/23 A2965

RMK AO2 PK WND 20040/0327 RAE20 PRESRR

SLP038 P0006 T02390228 TSNO \$=

200807240253 METAR KBRO 240253Z AUTO 19028G39KT 10SM RA BKN018 OVC023

24/23 A2959 RMK AO2 PK WND 19041/0211

RAB10E26B50 SLP018 P0003 60030 T02390228

53039 TSNO \$=

200807240153 METAR KBRO 240153Z AUTO 19028G40KT 10SM BKN016 OVC023 24/23

A2954 RMK AO2 PK WND 20043/0057 RAE47

SLP002 P0013 T02390228 TSNO \$=

Hurricane Gustav: Alexandria, Louisiana 2008

```
#####
# Query made at 05/27/2019 21:39:29 UTC
# Time interval: from 09/02/2008 01:00 to 09/02/2008 23:59 UTC
#####
##### KAX, Alexandria, Alexandria International Airport (United States)
# WMO index: 74754
# Latitude 31-20-05N. Longitude 092-33-31W. Altitude 27 m.
#####

#####
# METAR/SPECI from KAX
#####
200809022353 METAR KAX 022353Z 18008KT 4SM TSRA BR FEW009 BKN036 OVC065
    26/26 A2962 RMK AO2 LTG DSNT NE AND
    S TSB06 SLP033 P0101 60143 T02610256
    10283 20261 53009=
200809022351 SPECI KAX 022351Z 18009G18KT 4SM TSRA BR SCT009 BKN036 OVC065
    26/26 A2963 RMK AO2 LTG DSNT NE AND
    S TSB06 P0101=
200809022348 SPECI KAX 022348Z 19009G18KT 2 1/2SM TSRA BR SCT009 BKN023
    OVC036 26/26 A2962 RMK AO2 LTG DSNT
    S TSB06 P0100=
200809022331 SPECI KAX 022331Z 22010G17KT 3/4SM +TSRA BR FEW008 BKN015
    OVC042 27/26 A2962 RMK AO2 LTG DSNT
    S AND SW TSB06 P0061=
200809022318 SPECI KAX 022318Z 18005KT 3/4SM +TSRA BR SCT014 BKN031 OVC070
    27/26 A2961 RMK AO2 LTG DSNT SW TSB06
    P0025=
200809022306 SPECI KAX 022306Z 13004KT 2 1/2SM VCTS RA BR FEW030 BKN060
    OVC070 27/26 A2960 RMK AO2 LTG DSNT
    SW TSB06 P0003=
200809022253 METAR KAX 022253Z 13004KT 3SM RA BR FEW019 BKN050 OVC075
    26/26 A2960 RMK AO2 LTG DSNT SW SLP027
    P0020 T02610261=
200809022245 SPECI KAX 022245Z 00000KT 2SM RA BR SCT019 BKN031 OVC060
    27/26 A2961 RMK AO2 P0018=
200809022231 SPECI KAX 022231Z 18004KT 1 3/4SM +RA BR BKN019 OVC037 27/26
    A2961 RMK AO2 LTG DSNT W P0011=
200809022221 SPECI KAX 022221Z 16005KT 4SM RA BR BKN019 BKN042 OVC055
    27/26 A2960 RMK AO2 P0004=
200809022153 METAR KAX 022153Z 18007KT 9SM -RA FEW013 OVC044 27/26 A2961
```

RMK AO2 SLP027 P0020 T02720256=
200809022140 SPECI KAEK 022140Z 19007KT 3SM -RA BR SCT017 SCT027 OVC042
27/26 A2961 RMK AO2 P0020=
200809022122 SPECI KAEK 022122Z 21005KT 1 3/4SM RA BR FEW027 BKN040 OVC050
27/26 A2961 RMK AO2 P0008=
200809022053 METAR KAEK 022053Z 17008KT 8SM -RA SCT040 BKN048 BKN055 28/26
A2960 RMK AO2 RAB25 SLP024 P0001
60002 T02780261 58007=
200809021953 METAR KAEK 021953Z 17006KT 10SM FEW036 SCT043 BKN060 27/26
A2961 RMK AO2 RAB29E50 SLP028 P0001
T02720261=
200809021853 METAR KAEK 021853Z 19010G18KT 10SM SCT017 BKN047 OVC055 27/25
A2962 RMK AO2 RAB25E52 SLP031 P0000
T02720250=
200809021851 SPECI KAEK 021851Z 19013G18KT 10SM -RA SCT017 BKN047 OVC055
27/25 A2962 RMK AO2 RAB25 P0000=
200809021753 METAR KAEK 021753Z 17011G21KT 10SM OVC015 26/25 A2962 RMK
AO2 RAB03E26 SLP031 P0000 60039 T02610250
10261 20250 51020=
200809021719 SPECI KAEK 021719Z 18012G19KT 10SM -RA OVC015 26/24 A2962
RMK AO2 RAB03 P0000=
200809021653 METAR KAEK 021653Z 19011G23KT 10SM OVC013 26/24 A2961 RMK
AO2 PK WND 20027/1637 RAE53 SLP029
P0004 T02560244=
200809021634 SPECI KAEK 021634Z 19013G19KT 10SM -RA FEW010 OVC017 26/25
A2961 RMK AO2 P0004=
200809021627 SPECI KAEK 021627Z 17012G18KT 7SM -RA FEW008 BKN013 OVC020
26/25 A2960 RMK AO2 P0004=
200809021619 SPECI KAEK 021619Z 18013G17KT 3SM -RA BR FEW011 OVC017 26/25
A2960 RMK AO2 P0004=
200809021611 SPECI KAEK 021611Z 17012G22KT 2SM RA BR FEW008 BKN014 OVC021
25/25 A2960 RMK AO2 P0004=
200809021555 SPECI KAEK 021555Z 18014G20KT 2 1/2SM -RA BR SCT010 BKN016
OVC023 25/25 A2959 RMK AO2 P0000=
200809021553 METAR KAEK 021553Z 18011G18KT 2 1/2SM -RA BR BKN007 BKN012
OVC023 25/25 A2959 RMK AO2 SLP022
P0005 T02500250=
200809021527 SPECI KAEK 021527Z 17012G20KT 4SM -RA BR BKN007 BKN012 OVC023
25/24 A2958 RMK AO2 P0003=
200809021516 SPECI KAEK 021516Z 18013G22KT 2SM RA BR BKN007 BKN012 OVC023
25/24 A2957 RMK AO2 P0002=
200809021453 METAR KAEK 021453Z 17011G22KT 3SM -RA BR BKN009 OVC014 25/24
A2956 RMK AO2 CIG 007V011 SLP011
P0008 60030 T02500244 51019=
200809021444 SPECI KAEK 021444Z 17012G20KT 2 1/2SM RA BR SCT009 OVC015

25/24 A2955 RMK AO2 P0007=
200809021436 SPECI KAEK 021436Z 17012G21KT 2 1/2SM RA BR BKN012 OVC018
25/24 A2955 RMK AO2 P0005=
200809021429 SPECI KAEK 021429Z 17013G18KT 2 1/2SM RA BR SCT009 OVC015
25/24 A2955 RMK AO2 P0003=
200809021425 SPECI KAEK 021425Z 18010G17KT 2 1/2SM -RA BR SCT010 OVC016
25/24 A2954 RMK AO2 P0003=
200809021410 SPECI KAEK 021410Z 18011G20KT 3SM -RA BR BKN010 OVC018 25/24
A2954 RMK AO2 P0001=
200809021353 METAR KAEK 021353Z AUTO 18012G24KT 2 1/2SM -RA BR SCT010
OVC016 25/24 A2953 RMK AO2 SLP001
P0013 T02500244=
200809021349 SPECI KAEK 021349Z AUTO 17013G24KT 2 1/2SM -RA BR FEW008
BKN015 OVC021 25/24 A2952 RMK AO2
P0012=
200809021343 SPECI KAEK 021343Z AUTO 17012G22KT 2 1/2SM -RA BR BKN012
OVC019 25/24 A2952 RMK AO2 P0012=
200809021338 SPECI KAEK 021338Z AUTO 18013G24KT 3SM RA BR FEW008 OVC015
25/24 A2952 RMK AO2 P0011=
200809021329 SPECI KAEK 021329Z AUTO 17015G24KT 2 1/2SM -RA BR SCT010
OVC015 25/24 A2951 RMK AO2 P0010=
200809021322 SPECI KAEK 021322Z AUTO 17015G24KT 1 1/2SM RA BR FEW007 BKN012
OVC019 25/24 A2951 RMK AO2 P0009=
200809021315 SPECI KAEK 021315Z AUTO 18012G22KT 1 3/4SM +RA BR FEW009
BKN015 OVC021 25/24 A2951 RMK AO2
P0006=
200809021313 SPECI KAEK 021313Z AUTO 18016G25KT 1 3/4SM RA BR SCT010 BKN015
OVC021 25/24 A2951 RMK AO2 P0005=
200809021307 SPECI KAEK 021307Z AUTO 17014G25KT 2SM RA BR BKN012 OVC021
25/24 A2951 RMK AO2 P0002=
200809021253 METAR KAEK 021253Z AUTO 17010G22KT 3SM -RA BR FEW010 BKN015
OVC020 25/24 A2950 RMK AO2 SLP992
P0009 T02500244=
200809021218 SPECI KAEK 021218Z AUTO 17012G23KT 4SM -RA FEW010 BKN017
OVC028 25/ A2948 RMK AO2 P0007=
200809021200 SPECI KAEK 021200Z AUTO 17014G21KT 3SM +RA BKN012 BKN019
OVC029 25/ A2947 RMK AO2 P0003 \$=
200809021153 METAR KAEK 021153Z AUTO 16012G25KT 4SM -RA SCT010 BKN016
OVC023 25/ A2947 RMK AO2 SLP982 P0016
60097 70594 T0250 10250 20244 53031
\$=
200809021141 SPECI KAEK 021141Z AUTO 17013G21KT 4SM -RA FEW009 BKN012
OVC018 25/ A2946 RMK AO2 P0015 \$=
200809021134 SPECI KAEK 021134Z AUTO 16011G20KT 3SM -RA FEW009 BKN015
OVC022 25/ A2946 RMK AO2 P0014 \$=

200809021125 SPECI KAFX 021125Z AUTO 16013G24KT 2 1/2SM RA SCT010 BKN016
OVC022 25/ A2945 RMK AO2 P0011 \$=

200809021117 SPECI KAFX 021117Z AUTO 16013G24KT 3SM RA FEW009 BKN013 OVC022
25/ A2945 RMK AO2 P0008 \$=

200809021053 METAR KAFX 021053Z AUTO 16013G24KT 3SM RA FEW010 BKN017 OVC040
25/ A2944 RMK AO2 SLP971 P0017 T0250
\$=

200809021045 SPECI KAFX 021045Z AUTO 16014G24KT 4SM RA SCT010 BKN017 OVC032
25/ A2943 RMK AO2 P0015 \$=

200809021032 SPECI KAFX 021032Z AUTO 16015G21KT 2SM RA FEW010 BKN016 OVC022
24/ A2943 RMK AO2 P0011 \$=

200809021025 SPECI KAFX 021025Z AUTO 16015G23KT 2 1/2SM +RA FEW008 BKN014
OVC021 25/ A2942 RMK AO2 P0007 \$=

200809021022 SPECI KAFX 021022Z AUTO 16012G23KT 3SM RA FEW008 BKN014 OVC022
25/ A2942 RMK AO2 P0004 \$=

200809020953 METAR KAFX 020953Z AUTO 16013G20KT 3SM -RA FEW008 BKN019
OVC025 24/ A2941 RMK AO2 SLP960 P0018
T0244 \$=

200809020935 SPECI KAFX 020935Z AUTO 17014G21KT 4SM -RA FEW009 BKN014
OVC021 24/ A2940 RMK AO2 P0012 \$=

200809020927 SPECI KAFX 020927Z AUTO 16013G23KT 3SM RA SCT010 BKN017 OVC025
25/ A2939 RMK AO2 P0010 \$=

200809020903 SPECI KAFX 020903Z AUTO 16014G21KT 2 1/2SM RA SCT010 BKN016
OVC023 24/ A2938 RMK AO2 P0004 \$=

200809020853 METAR KAFX 020853Z AUTO 16015G24KT 3SM RA FEW008 BKN014 OVC020
24/ A2938 RMK AO2 PK WND 17028/0817
SLP950 P0014 60046 T0244 52038 \$=

200809020839 SPECI KAFX 020839Z AUTO 16014G23KT 3SM -RA FEW008 BKN012
OVC017 24/ A2937 RMK AO2 PK WND 17028/0817
P0011 \$=

200809020837 SPECI KAFX 020837Z AUTO 16014G23KT 2 1/2SM RA BKN010 OVC016
24/ A2937 RMK AO2 PK WND 17028/0817
P0011 \$=

200809020831 SPECI KAFX 020831Z AUTO 16015G23KT 3SM RA SCT008 BKN016 OVC025
24/ A2936 RMK AO2 PK WND 17028/0817
P0009 \$=

200809020753 METAR KAFX 020753Z AUTO 16019G26KT 2SM RA SCT008 OVC014 24/
A2934 RMK AO2 PK WND 15031/0738 SLP937
P0015 T0244 \$=

200809020733 SPECI KAFX 020733Z AUTO 15019G28KT 2SM RA SCT008 BKN014 OVC022
24/ A2933 RMK AO2 PK WND 15031/0654
P0010 \$=

200809020726 SPECI KAFX 020726Z AUTO 15021G29KT 2SM RA BKN008 BKN014 OVC024
24/ A2932 RMK AO2 PK WND 15031/0654
CIG 006V012 P0009 \$=

200809020713 SPECI KAFX 020713Z AUTO 15021G29KT 2SM RA BKN010 OVC014 24/
A2932 RMK AO2 PK WND 15031/0654 CIG
006V013 P0005 \$=

200809020700 SPECI KAFX 020700Z AUTO 15020G31KT 2SM RA BKN008 OVC016 24/
A2931 RMK AO2 PK WND 15031/0654 P0002
\$=

200809020653 METAR KAFX 020653Z AUTO 15024G30KT 2SM RA BKN010 OVC013 24/
A2930 RMK AO2 PK WND 13036/0616 SLP926
P0017 T0244 \$=

200809020602 SPECI KAFX 020602Z AUTO 14025G32KT 2SM RA BKN008 OVC015 24/
A2927 RMK AO2 PK WND 14032/0602 P0003
\$=

200809020553 METAR KAFX 020553Z AUTO 14026G35KT 2SM RA SCT008 BKN013 OVC019
24/ A2927 RMK AO2 PK WND 13038/0505
SLP912 P0025 60321 T0244 10250 20244
402780244 51048 \$=

200809020512 SPECI KAFX 020512Z AUTO 13026G38KT 1 3/4SM RA BKN008 OVC014
24/ A2924 RMK AO2 PK WND 13038/0505
CIG 006V010 P0004 \$=

200809020504 SPECI KAFX 020504Z AUTO 13028G38KT 2SM -RA BKN011 OVC016
24/ A2923 RMK AO2 PK WND 13038/0502
CIG 006V014 P0001 \$=

200809020453 METAR KAFX 020453Z AUTO 13030G40KT 2SM RA BKN009 OVC016 24/
A2922 RMK AO2 PK WND 13047/0443 CIG
006V014 SLP897 P0006 T0244 \$=

200809020425 SPECI KAFX 020425Z AUTO 12030G39KT 2SM -RA BKN009 OVC014
25/ A2919 RMK AO2 PK WND 11040/0409
CIG 007V011 P0004 \$=

200809020418 SPECI KAFX 020418Z AUTO 12029G40KT 1 3/4SM RA OVC009 25/
A2919 RMK AO2 PK WND 11040/0409 CIG
007V013 P0003 \$=

200809020410 SPECI KAFX 020410Z AUTO 12030G40KT 2SM -RA BKN009 OVC014
25/ A2918 RMK AO2 PK WND 11040/0409
CIG 007V011 P0002 \$=

200809020353 METAR KAFX 020353Z AUTO 11024G40KT 1 3/4SM RA OVC012 25/
A2917 RMK AO2 PK WND 11044/0342 SLP880
P0023 T0250 \$=

200809020341 SPECI KAFX 020341Z AUTO 10026G43KT 1 3/4SM RA BKN012 OVC018
25/ A2916 RMK AO2 PK WND 10043/0332
P0022 \$=

200809020333 SPECI KAFX 020333Z AUTO 10032G43KT 1 1/2SM +RA BKN009 OVC016
25/ A2915 RMK AO2 PK WND 10043/0332
P0020 \$=

200809020305 SPECI KAFX 020305Z AUTO 09023G40KT 1 1/4SM +RA BKN010 BKN013
OVC018 24/ A2913 RMK AO2 PK WND 09040/0303

P0010 \$=

200809020253 METAR KAEX 020253Z AUTO 08024G38KT 1 1/4SM +RA BKN008 BKN013
OVC018 25/ A2912 RMK AO2 PK WND 05044/0207
SLP864 P0103 60267 T0250 53014 \$=

200809020249 SPECI KAEX 020249Z AUTO 08024G38KT 1 1/4SM +RA BKN008 BKN013
OVC018 25/ A2912 RMK AO2 PK WND 05044/0207
P0100 \$=

200809020236 SPECI KAEX 020236Z AUTO 07026G36KT 1SM +RA BR SCT006 BKN011
OVC018 25/24 A2912 RMK AO2 PK WND
05044/0207 P0087 \$=

200809020225 SPECI KAEX 020225Z AUTO 07027G38KT 3/4SM +RA BR BKN006 OVC011
24/24 A2911 RMK AO2 PK WND 05044/0207
P0068 \$=

200809020153 METAR KAEX 020153Z AUTO 06028G42KT 1SM +RA BKN009 OVC019
24/ A2908 RMK AO2 PK WND 05051/0138
LTG DSNT NE AND E SLP850 P0099 T0244
\$=

200809020148 SPECI KAEX 020148Z AUTO 05026G49KT 3/4SM +RA BKN011 OVC017
24/ A2908 RMK AO2 PK WND 05051/0138
LTG DSNT NE AND E P0088 \$=

200809020135 SPECI KAEX 020135Z 05029G48KT 1SM +RA BKN013 OVC023 24/ A2907
RMK AO2 PK WND 04049/0124 LTG DSNT
E P0060 \$=

Hurricane Ike: Houston, Texas 2008

```
#####
# Query made at 05/27/2019 22:17:32 UTC
# Time interval: from 09/14/2008 12:00 to 09/15/2008 12:59 UTC
#####

#####
# KHOU, Houston, Houston Hobby Airport (United States)
# WMO index: -----
# Latitude 29-38-15N. Longitude 095-16-57W. Altitude 14 m.
#####

#####
# METAR/SPECI from KHOU
#####
200809151253 METAR KHOU 151253Z AUTO -RA A3007 RMK AO2 SLPNO $=
200809151153 METAR KHOU 151153Z AUTO -RA A3006 RMK AO2 SLPNO 6/// 7///
      53014 $=
200809151053 METAR KHOU 151053Z AUTO -RA A3003 RMK AO2 SLPNO $=
200809151003 METAR KHOU 151003Z 35009KT 10SM SCT120 BKN250 22/19 A3003=
200809150953 METAR KHOU 150953Z AUTO -RA A3003 RMK AO2 SLPNO $=
200809150853 METAR KHOU 150853Z AUTO -RA A3002 RMK AO2 SLPNO 6/// 56007
200809150753 METAR KHOU 150753Z AUTO -RA A3002 RMK AO2 SLPNO $=
200809150653 METAR KHOU 150653Z AUTO -RA A3003 RMK AO2 SLPNO $=
200809150553 METAR KHOU 150553Z AUTO -RA A3004 RMK AO2 SLPNO 6/// 52017
      TSNO $=
200809150511 METAR KHOU 150511Z 03012KT 10SM BKN120 OVC250 24/21 A3003
      SLP 169=
200809150353 METAR KHOU 150353Z AUTO -RA A3001 RMK AO2 SLPNO $=
200809150253 METAR KHOU 150253Z AUTO -RA A2999 RMK AO2 SLPNO 6/// 52020
200809150153 METAR KHOU 150153Z AUTO -RA A2997 RMK AO2 SLPNO $=
200809150053 METAR KHOU 150053Z AUTO -RA A2995 RMK AO2 SLPNO $=
200809142353 METAR KHOU 142353Z AUTO -RA A2993 RMK AO2 SLPNO 6/// 53010
      $=
200809142256 METAR KHOU 142256Z 02008KT 10SM FEW080 SCT150 OVC250 27/22
      A2991 RMK SLP128=
200809142253 METAR KHOU 142253Z AUTO -RA A2990 RMK AO2 SLPNO $=
200809142153 METAR KHOU 142153Z AUTO -RA A2990 RMK AO2 SLPNO $=
200809142053 METAR KHOU 142053Z AUTO -RA A2990 RMK AO2 SLPNO P0000 60000
      50011 $=
200809141953 METAR KHOU 141953Z AUTO 05010KT 10SM -RA CLR 28/21 A2991
      RMK AO2 SLPNO P0000 T02780206 $=
200809141853 METAR KHOU 141853Z AUTO 05008KT 10SM -RA SCT022 27/22 A2991
      RMK AO2 SLPNO P0000 T02720217 $=
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200809141841 SPECI KHOU 141841Z AUTO 01011G17KT 10SM -RA FEW020 27/22
A2990 RMK AO2 P0000 \$=

200809141805 SPECI KHOU 141805Z AUTO 36009KT 10SM -RA BKN015 27/23 A2989
RMK AO2 P0000 \$=

200809141753 METAR KHOU 141753Z AUTO 35012KT 10SM -RA BKN013 27/23 A2987
RMK AO2 SLPNO P0000 6/// T02670233
56009 \$=

200809141653 METAR KHOU 141653Z AUTO 32006KT 10SM -RA FEW007 26/23 A2989
RMK AO2 SLPNO P0000 T02560233 \$=

200809141638 SPECI KHOU 141638Z AUTO 30007KT 10SM -RA FEW007 25/23 A2990
RMK AO2 P0000 \$=

200809141553 METAR KHOU 141553Z AUTO 33007KT 10SM -RA CLR 24/23 A2989
RMK AO2 SLPNO P0007 T02440228 \$=

200809141531 SPECI KHOU 141531Z AUTO 32008KT 10SM -RA SCT019 24/22 A2989
RMK AO2 P0007 \$=

200809141453 METAR KHOU 141453Z AUTO 36007KT 8SM -RA BKN025 OVC055 23/22
A2990 RMK AO2 TSB1354E44 SLPNO P0006
6/// T02280217 50032 \$=

200809141444 SPECI KHOU 141444Z AUTO 02007KT 6SM -RA BR BKN029 BKN044
OVC055 23/22 A2990 RMK AO2 TSB1354E44
P0005 \$=

200809141427 SPECI KHOU 141427Z AUTO 12005KT 5SM -TSRA BR FEW043 SCT050
BKN065 23/22 A2992 RMK AO2 LTG DSNT
N-SE TSB1354 P0000 \$=

200809141424 SPECI KHOU 141424Z AUTO 10005KT 1SM -TSRA BR SCT046 SCT075
23/22 A2992 RMK AO2 LTG DSNT N-SE
TSB1354 P0000 \$=

200809141400 SPECI KHOU 141400Z AUTO 19004KT 10SM VCTS -RA 23/21 A2991
RMK AO2 LTG DSNT NE-S TSB1354 P0000=

200809141353 METAR KHOU 141353Z AUTO 14007KT 9SM -RA 23/21 A2991 RMK AO2
PRESRR SLPNO T02280211 TSNO=

200809141318 SPECI KHOU 141318Z 34008KT 9SM -TSRW FEW009 BKN025 OVC100
24/23 A2985 RMK OCNL LTG SE-SW TSTM
SE MOVG SE=

200809141301 SPECI KHOU 141301Z 35010KT 3SM -SHRA FEW009 BKN020 OVC080
24/23 A2985=

200809141253 METAR KHOU 141253Z AUTO -RA A2985 RMK AO2 SLPNO TSNO=

200809141251 METAR KHOU 141251Z 35015KT 11/4SM RA SCT009 OVC020 24/23
A2985 SLP108=

200809141241 SPECI KHOU 141241Z 35015KT 11/4SM SHRA BKN009 BKN020 OVC100
25/24 A2986=

200809141233 SPECI KHOU 141233Z 35012G18KT 7SM SHRA BKN009 BKN020 OVC100
25/24 A2986 RMK SLP112 RB31=

Hurricane Irene: Cherry Point, North Carolina 2011

```
#####
# Query made at 05/28/2019 18:53 UTC
# Time interval: from 08/28/2011 01:00 to 08/28/2011 23:59 UTC
#####
##### KNKT, Cherry Point, Marine Corps Air Station (United States)
# WMO index: 72309
# Latitude 34-53-52N. Longitude 076-52-51W. Altitude 8 m.
#####

#####
# METAR/SPECI from KNKT
#####
201108282354 METAR KNKT 282354Z AUTO 19004KT 7SM CLR 26/21 A2970 RMK AO2
    SLP055 T02610211 10333 20261 51018
    PWINO $=
201108282254 METAR KNKT 282254Z AUTO 18008KT 10SM CLR 28/20 A2969 RMK
    AO2 SLP049 T02780200 PWINO $=
201108282154 METAR KNKT 282154Z AUTO 19008KT 10SM CLR 30/21 A2967 RMK
    AO2 SLP044 T03000206 PWINO $=
201108282054 METAR KNKT 282054Z 20007G37KT 10SM CLR 32/21 A2965 RMK AO2
    PK WND 18037/2049 SLP037 T03170206
    53000 $=
201108281954 METAR KNKT 281954Z 19009KT 10SM CLR 32/20 A2964 RMK AO2 SLP035
    T03170200 $=
201108281854 METAR KNKT 281854Z 22007KT 10SM CLR 33/19 A2965 RMK AO2 SLP036
    T03280189 $=
201108281754 METAR KNKT 281754Z 24009KT 10SM CLR 33/19 A2965 RMK AO2 SLP037
    6/// T03280194 10328 20233 58005
    $=
201108281654 METAR KNKT 281654Z 24007KT 10SM CLR 32/19 A2966 RMK AO2 PK
    WND 19032/1643 SLP039 T03170194 $=
201108281554 METAR KNKT 281554Z 22006KT 10SM CLR 30/19 A2966 RMK AO2 SLP040
    T03000189 $=
201108281454 METAR KNKT 281454Z 30007KT 10SM CLR 29/19 A2966 RMK AO2 SLP041
    6/// T02940189 53016 $=
201108281354 METAR KNKT 281354Z 28005KT 10SM CLR 28/19 A2964 RMK AO2 PK
    WND 19031/1256 SLP033 T02780189 $=
201108281254 METAR KNKT 281254Z 27011KT 8SM 26/19 A2963 RMK AO2 SLP030
    T02560189 $=
201108281154 METAR KNKT 281154Z COR 24005KT 7SM CLR 23/19 A2962 RMK AO2
    SLP025 P0001 60003 7/// T02330194
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10250 20206 53022=

201108281054 METAR KNKT 281054Z 23006KT 7SM BKN080 22/19 A2959 RMK AO2
PK WND 16059/1010 SLP018 T02220189
\$=

201108280954 METAR KNKT 280954Z 24007KT 9SM CLR 22/19 A2957 RMK AO2 PK
WND 16043/0909 SLP009 P0001 T02220189
\$=

201108280854 METAR KNKT 280854Z 24008KT 9SM FEW100 21/19 A2955 RMK AO2
SLP003 60001 T02110194 53008 \$=

201108280754 METAR KNKT 280754Z 25008KT 10SM CLR 23/19 A2953 RMK AO2 PK
WND 16060/0731 SLP998 T02330194 \$=

201108280654 METAR KNKT 280654Z 27010G32KT 10SM FEW120 25/19 A2951 RMK
AO2 PK WND 16056/0558 SLP990 P0001
T02500194 \$=

201108280554 METAR KNKT 280554Z 25015G41KT 10SM CLR 25/20 A2953 RMK AO2
PK WND 16061/0520 SLP995 60002 T02500200
10256 20228 51019 \$=

201108280454 METAR KNKT 280454Z 25015G38KT 210V270 10SM CLR 25/20 A2951
RMK AO2 PK WND 16068/0401 WSHFT 0421
SLP991 T02500200 \$=

201108280441 SPECI KNKT 280441Z 25018G36KT 10SM CLR 25/21 A2951 RMK AO2
PK WND 16068/0401 WSHFT 0421 \$=

201108280430 SPECI KNKT 280430Z 25015G63KT 10SM CLR 24/21 A2951 RMK AO2
PK WND 16068/0401 WSHFT 0410 \$=

201108280354 METAR KNKT 280354Z 22026G65KT 160V250 10SM CLR 24/21 A2950
RMK AO2 PK WND 17068/0318 WSHFT 0300
SLP985 P0001 T02440206 \$=

201108280314 SPECI KNKT 280314Z 18040G62KT 170V250 10SM CLR 25/20 A2948
RMK AO2 PK WND 16062/0310 WSHFT 0300
\$=

201108280254 METAR KNKT 280254Z 26021G34KT 10SM CLR 25/20 A2947 RMK AO2
PK WND 17060/0239 RAE33 SLP976 P0000
60001 T02500200 51061 \$=

201108280154 METAR KNKT 280154Z 27030G41KT 10SM -RA FEW110 25/19 A2943
RMK AO2 PK WND 28050/0100 SLP962
P0001 T02500194 \$=

Hurricane Irene: Long Island, New York 2011

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#####
# Query made at 05/28/2019 18:41:47 UTC
# Time interval: from 08/29/2011 05:00 to 08/30/2011 05:59 UTC
#####
##### KISP, Islip, Long Island Mac Arthur Airport (United States)
# WMO index: -----
# Latitude 40-47-38N. Longitude 073-06-06W. Altitude 30 m.
#####

#####
# METAR/SPECI from KISP
#####
201108300556 METAR KISP 300556Z 00000KT 10SM FEW140 SCT250 17/15 A3002
    RMK AO2 SLP166 T01670150 10206 20167
    51005 $=
201108300456 METAR KISP 300456Z 00000KT 10SM FEW140 SCT250 17/15 A3002
    RMK AO2 SLP165 T01720150 402560128
    $=
201108300356 METAR KISP 300356Z 00000KT 10SM FEW140 18/16 A3002 RMK AO2
    SLP167 T01830156 $=
201108300256 METAR KISP 300256Z 29003KT 10SM FEW140 18/16 A3001 RMK AO2
    SLP161 T01780161 51012 $=
201108300156 METAR KISP 300156Z 24003KT 10SM FEW250 18/16 A3001 RMK AO2
    SLP161 T01780156 $=
201108300056 METAR KISP 300056Z 35004KT 10SM SCT250 18/13 A3000 RMK AO2
    SLP158 T01830128 $=
201108292356 METAR KISP 292356Z 00000KT 10SM FEW140 BKN250 21/12 A2997
    RMK AO2 SLP150 T02060122 10256 20206
    51014 $=
201108292256 METAR KISP 292256Z 29003KT 10SM FEW140 BKN250 23/11 A2996
    RMK AO2 SLP145 T02330106 $=
201108292156 METAR KISP 292156Z 33008KT 10SM SCT140 BKN250 24/09 A2995
    RMK AO2 SLP140 T02440094 $=
201108292056 METAR KISP 292056Z 29005KT 10SM FEW140 BKN250 24/08 A2993
    RMK AO2 SLP135 T02440083 53001 $=
201108291956 METAR KISP 291956Z 29009KT 10SM FEW060 SCT250 25/07 A2992
    RMK AO2 SLP132 T02500072=
201108291856 METAR KISP 291856Z 32007KT 270V350 10SM FEW060 25/11 A2992
    RMK AO2 SLP132 T02500106=
201108291756 METAR KISP 291756Z 35007KT 10SM FEW055 24/12 A2993 RMK AO2
    SLP135 T02440122 10250 20172 55001=
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201108291656 METAR KISP 291656Z VRB06KT 10SM FEW050 24/12 A2992 RMK AO2
SLP132 T02440122=

201108291556 METAR KISP 291556Z 24004KT 10SM CLR 23/12 A2993 RMK AO2 SLP135
T02330122=

201108291456 METAR KISP 291456Z VRB03KT 10SM CLR 22/12 A2993 RMK AO2 SLP136
T02170117 53016=

201108291356 METAR KISP 291356Z 33003KT 10SM CLR 21/12 A2992 RMK AO2 SLP130
T02060117=

201108291256 METAR KISP 291256Z 32006KT 10SM FEW100 19/13 A2989 RMK AO2
SLP122 T01940128=

201108291156 METAR KISP 291156Z 29004KT 10SM FEW100 17/12 A2989 RMK AO2
SLP120 T01720122 10172 20128 51031
\$=

201108291056 METAR KISP 291056Z 24004KT 10SM CLR 14/12 A2987 RMK AO2 SLP113
T01440117 \$=

201108290956 METAR KISP 290956Z 23004KT 10SM CLR 14/12 A2983 RMK AO2 SLP100
T01390117 \$=

201108290856 METAR KISP 290856Z 00000KT 10SM CLR 14/12 A2980 RMK AO2 SLP089
T01440117 51019 \$=

201108290756 METAR KISP 290756Z 23005KT 10SM CLR 14/12 A2979 RMK AO2 SLP087
T01440122 \$=

201108290656 METAR KISP 290656Z 27004KT 10SM CLR 16/12 A2976 RMK AO2 SLP077
T01560122 \$=

201108290556 METAR KISP 290556Z 27006KT 10SM CLR 17/12 A2974 RMK AO2 SLP070
T01720122 10217 20172 51024 \$=

Hurricane Isaac: Baton Rouge, Louisiana 2012

```
#####
# Query made at 05/28/2019 19:28:34 UTC
# Time interval: from 08/31/2012 00:00 to 08/31/2012 23:59 UTC
#####
##### KBTR, Baton Rouge, Baton Rouge Metropolitan, Ryan Field (United States)
# WMO index: -----
# Latitude 30-32-14N. Longitude 091-08-49W. Altitude 21 m.
#####

#####
# METAR/SPECI from KBTR
#####
201208312353 METAR KBTR 312353Z 14006KT 10SM FEW100 26/24 A3005 RMK AO2
    RAE22 SLP175 P0000 60022 T02610239
    10278 20244 55001=
201208312253 METAR KBTR 312253Z 15006KT 10SM -RA SCT035 27/25 A3004 RMK
    AO2 RAB41 SLP170 P0000 T02670250=
201208312153 METAR KBTR 312153Z COR 15008KT 10SM SCT025 28/25 A3004 RMK
    AO2 SLP171 T02780250=
201208312053 METAR KBTR 312053Z 16009KT 10SM FEW042 SCT090 27/25 A3005
    RMK AO2 RAE41 SLP176 P0004 60022
    T02670250 57005=
201208311953 METAR KBTR 311953Z 16008KT 10SM -RA FEW055 SCT070 BKN090
    26/24 A3007 RMK AO2 RAE03B34 SLP180
    P0000 T02560239=
201208311853 METAR KBTR 311853Z COR 21007KT 7SM FEW013 BKN033 OVC120 25/24
    A3006 RMK AO2 SLP177 P0018 T02500239=
201208311753 METAR KBTR 311753Z 20008KT 5SM +RA BR SCT034 SCT080 BKN100
    27/25 A3007 RMK AO2 TSE49 SLP181
    LTGCG P0003 60019 T02670250 10300
    20261 50002=
201208311653 METAR KBTR 311653Z 22012G20KT 2SM +TSRA SCT019 BKN031 OVC065
    27/26 A3007 RMK AO2 TSB52RAB1554E10B31
    SLP182 LTGCG P0016 T02670256=
201208311553 METAR KBTR 311553Z 9SM BKN013 OVC024 29/25 A3007 RMK AO2
    RAB29E38 SLP181 P0000 T02890250 $=
201208311453 METAR KBTR 311453Z 18010KT 10SM BKN013 BKN018 28/25 A3006
    RMK AO2 SLP178 T02830250 51022 $=
201208311353 METAR KBTR 311353Z 16010KT 10SM BKN013 BKN022 28/25 A3004
    RMK AO2 SLP173 T02780250 $=
201208311253 METAR KBTR 311253Z 15006KT 10SM SCT011 SCT018 27/25 A3002
```

RMK AO2 SLP166 T02670250 \$=

201208311153 METAR KBTR 311153Z 14007KT 10SM BKN012 OVC025 26/25 A3000
RMK AO2 SLP156 70044 T02610250 10267
20244 53020 \$=

201208311053 METAR KBTR 311053Z 17008KT 10SM OVC010 27/26 A2998 RMK AO2
SLP149 T02670256 \$=

201208310953 METAR KBTR 310953Z AUTO 16008KT 10SM OVC012 27/26 A2996 RMK
AO2 SLP142 T02670256 TSNO \$=

201208310853 METAR KBTR 310853Z AUTO 17011KT 10SM OVC012 26/26 A2994 RMK
AO2 SLP136 T02610256 53003 TSNO \$=

201208310753 METAR KBTR 310753Z AUTO 16010KT 10SM SCT010 BKN100 26/25
A2993 RMK AO2 SLP132 T02610250 TSNO
\$=

201208310653 METAR KBTR 310653Z AUTO 16014G19KT 10SM FEW012 SCT017 BKN100
26/26 A2992 RMK AO2 SLP131 T02610256
TSNO \$=

201208310553 METAR KBTR 310553Z AUTO 15004KT 10SM SCT014 SCT027 24/24
A2993 RMK AO2 RAE17 SLP132 P0004
60030 T02440239 10278 20244 403060233
51010 TSNO \$=

201208310453 METAR KBTR 310453Z 19012G21KT 10SM -RA FEW018 BKN050 OVC085
24/23 A2992 RMK AO2 RAB12 SLP129
P0026 T02440233 \$=

201208310353 METAR KBTR 310353Z 17016G25KT 10SM FEW015 BKN095 OVC120 26/23
A2990 RMK AO2 SLP123 T02560233 \$=

201208310253 METAR KBTR 310253Z 16010G16KT 10SM FEW025 SCT032 BKN090 26/22
A2986 RMK AO2 SLP111 T02560222 53035
\$=

201208310153 METAR KBTR 310153Z 17012KT 10SM BKN100 26/22 A2982 RMK AO2
SLP097 T02560222 \$=

201208310053 METAR KBTR 310053Z 17010KT 10SM FEW110 26/22 A2978 RMK AO2
SLP085 T02610222 \$=

Hurricane Sandy: Atlantic City, New Jersey 2012

```
#####
# Query made at 05/28/2019 20:05:43 UTC
# Time interval: from 10/30/2012 00:00 to 10/30/2012 23:59 UTC
#####
# KACY, Atlantic City, Atlantic City International Airport (United States)
# WMO index: 72407
# Latitude 39-27-53N. Longitude 074-35-12W. Altitude 23 m.
#####

#####
# METAR/SPECI from KACY
#####
201210302354 METAR KACY 302354Z 20005KT 10SM OVC037 08/03 A2949 RMK AO2
    SLP984 T00780033 10094 20078 51019=
201210302254 METAR KACY 302254Z 20006KT 10SM FEW042 08/03 A2947 RMK AO2
    SLP979 T00780033=
201210302154 METAR KACY 302154Z 21005KT 10SM BKN040 OVC060 08/03 A2945
    RMK AO2 SLP973 T00830033=
201210302054 METAR KACY 302054Z 19009G18KT 10SM BKN042 OVC060 09/04 A2943
    RMK AO2 SLP965 T00890039 53012=
201210301954 METAR KACY 301954Z 19011G19KT 10SM SCT029 BKN036 OVC043 09/04
    A2941 RMK AO2 SLP958 T00940039=
201210301854 METAR KACY 301854Z 19009G20KT 10SM BKN028 OVC035 09/04 A2939
    RMK AO2 SLP952 T00940044=
201210301754 METAR KACY 301754Z 20012G17KT 10SM BKN026 OVC032 08/05 A2938
    RMK AO2 SLP948 60020 T00830050 10094
    20083 51019=
201210301654 METAR KACY 301654Z 20010KT 10SM OVC028 08/06 A2937 RMK AO2
    RAE27 SLP945 P0001 T00830061=
201210301554 METAR KACY 301554Z 20012G18KT 6SM -RA BR BKN015 BKN020 OVC027
    08/06 A2936 RMK AO2 SLP941 P0006
    T00830061=
201210301454 METAR KACY 301454Z AUTO 20009G18KT 7SM -RA FEW011 BKN022
    OVC031 09/07 A2932 RMK AO2 SLP929
    P0007 60013 T00890067 51036 TSNO=
201210301354 METAR KACY 301354Z AUTO 19015G24KT 5SM -RA BR SCT016 SCT025
    OVC037 09/07 A2929 RMK AO2 PK WND
    18028/1311 RAB02 SLP918 P0005 T00890067
    TSNO=
201210301254 METAR KACY 301254Z AUTO 18016G26KT 10SM SCT020 BKN028 OVC048
    09/06 A2926 RMK AO2 PK WND 20026/1250
```

RAE32 SLP907 P0001 T00940061 TSNO=
201210301154 METAR KACY 301154Z AUTO 19010G17KT 10SM -RA SCT013 BKN020
OVC047 09/07 A2922 RMK AO2 SLP893
P0009 60022 70348 T00890072 10094
20083 50026 TSNO \$=

201210301054 METAR KACY 301054Z AUTO 17013G21KT 8SM -RA FEW013 BKN030
OVC037 09/07 A2918 RMK AO2 SLP879
P0001 T00890067 TSNO \$=

201210300954 METAR KACY 300954Z AUTO 16012G23KT 10SM -RA SCT014 BKN021
OVC035 09/07 A2914 RMK AO2 SLP867
P0002 T00890072 TSNO \$=

201210300854 METAR KACY 300854Z AUTO 19012G18KT 10SM -RA BKN018 OVC025
08/07 A2911 RMK AO2 SLP857 P0003
60010 T00830067 51048 TSNO \$=

201210300754 METAR KACY 300754Z AUTO 17012G20KT 10SM -RA SCT017 BKN022
OVC032 09/07 A2907 RMK AO2 PK WND
18027/0707 SLP842 P0005 T00890067
TSNO \$=

201210300654 METAR KACY 300654Z AUTO 18014G24KT 10SM -RA SCT021 BKN026
OVC035 09/06 A2902 RMK AO2 PK WND
17035/0615 SLP828 P0002 T00940061
TSNO \$=

201210300554 METAR KACY 300554Z AUTO 18017G32KT 10SM -RA SCT022 OVC034
09/06 A2897 RMK AO2 PK WND 17040/0519
PRESRR SLP809 P0002 60018 T00940061
10144 20094 51115 TSNO \$=

201210300454 METAR KACY 300454Z AUTO 18024G38KT 10SM -RA SCT020 OVC031
10/07 A2888 RMK AO2 PK WND 16047/0413
RAB03E13B31 PRESRR SLP780 P0003 T01000072
401720100 TSNO=

201210300354 METAR KACY 300354Z AUTO 18026G45KT 10SM BKN017 OVC029 11/08
A2878 RMK AO2 PK WND 16050/0338 PRESRR
SLP743 P0003 T01060078 TSNO=

201210300254 METAR KACY 300254Z AUTO 17031G44KT 4SM BR BKN013 OVC019 11/09
A2863 RMK AO2 PK WND 18049/0221 SLP694
P0001 60010 T01060089 53208 TSNO=

201210300154 METAR KACY 300154Z AUTO 17026G45KT 2SM BR BKN007 OVC012 11/10
A2843 RMK AO2 PK WND 16049/0138 PRESRR
SLP626 P0003 T01110100 TSNO=

201210300054 METAR KACY 300054Z AUTO 17009KT 8SM BKN005 BKN011 OVC024
14/14 A2817 RMK AO2 WSHFT 0013 RAB2358E54
PRESRR SLP539 P0006 T01440139 TSNO=

Hurricane Arthur: Beaufort, North Carolina 2014

```
#####
# Query made at 05/28/2019 20:18:15 UTC
# Time interval: from 07/05/2014 00:00 to 07/05/2014 23:59 UTC
#####

#####
# KMRH, Beaufort, Michael J Smith Field Airport (United States)
# WMO index: -----
# Latitude 34-44-01N. Longitude 076-39-38W. Altitude 3 m.
#####

#####
# METAR/SPECI from KMRH
#####
201407052358 METAR KMRH 052358Z AUTO 09006KT 10SM CLR 24/13 A3023 RMK
    AO2 SLP235 T02390128 10267 20239
    50000 TSNO=>

201407052258 METAR KMRH 052258Z AUTO 10006KT 10SM CLR 25/14 A3022 RMK
    AO2 SLP234 T02500139 TSNO=>

201407052158 METAR KMRH 052158Z AUTO 10006KT 10SM CLR 26/14 A3023 RMK
    AO2 SLP236 T02560139 TSNO=>

201407052058 METAR KMRH 052058Z AUTO 09008KT 10SM CLR 26/14 A3023 RMK
    AO2 SLP235 T02560144 58004 TSNO=>

201407051958 METAR KMRH 051958Z AUTO 08011KT 10SM CLR 27/16 A3023 RMK
    AO2 SLP237 T02670156 TSNO=>

201407051858 METAR KMRH 051858Z AUTO 10008KT 10SM FEW050 27/16 A3023 RMK
    AO2 SLP238 T02670161 TSNO=>

201407051758 METAR KMRH 051758Z AUTO 07009KT 040V110 10SM SCT047 27/17
    A3024 RMK AO2 SLP240 T02670167 10278
    20239 58001 TSNO=>

201407051658 METAR KMRH 051658Z AUTO 03009KT 10SM CLR 28/14 A3024 RMK
    AO2 SLP242 T02780139 TSNO=>

201407051558 METAR KMRH 051558Z AUTO 05010KT 10SM CLR 27/14 A3025 RMK
    AO2 SLP243 T02670139 TSNO=>

201407051458 METAR KMRH 051458Z AUTO 05011G16KT 10SM CLR 26/14 A3024 RMK
    AO2 SLP240 T02610139 53009 TSNO=>

201407051358 METAR KMRH 051358Z AUTO 05010G18KT 10SM CLR 26/14 A3023 RMK
    AO2 SLP236 T02610144 TSNO=>

201407051258 METAR KMRH 051258Z AUTO 04008G19KT 10SM CLR 25/14 A3022 RMK
    AO2 SLP235 T02500144 TSNO=>

201407051158 METAR KMRH 051158Z AUTO 03010KT 10SM CLR 24/16 A3021 RMK
    AO2 SLP231 T02390156 10244 20222
    53017 TSNO=>
```

201407051058 METAR KMRH 051058Z AUTO 03008KT 10SM CLR 22/14 A3020 RMK
AO2 SLP225 T02220144 TSNO=

201407050958 METAR KMRH 050958Z AUTO 02009KT 10SM FEW075 OVC090 23/15
A3018 RMK AO2 SLP219 T02280150 TSNO=

201407050858 METAR KMRH 050858Z AUTO 03010KT 10SM OVC080 23/16 A3016 RMK
AO2 SLP214 T02330161 53014 TSNO=

201407050758 METAR KMRH 050758Z AUTO 02010KT 10SM OVC100 23/17 A3014 RMK
AO2 SLP206 T02330167 TSNO=

201407050658 METAR KMRH 050658Z AUTO 03008KT 10SM FEW095 24/18 A3012 RMK
AO2 SLP200 T02390178 TSNO=

201407050558 METAR KMRH 050558Z AUTO 02010KT 10SM CLR 24/20 A3012 RMK
AO2 SLP200 T02440200 10278 20244
51007 TSNO=

201407050458 METAR KMRH 050458Z AUTO 02004KT 6SM BR CLR 25/23 A3011 RMK
AO2 SLP198 T02500233 TSNO=

201407050358 METAR KMRH 050358Z AUTO 03003KT 8SM FEW075 OVC090 26/24 A3011
RMK AO2 SLP196 T02610239 TSNO=

201407050258 METAR KMRH 050258Z AUTO 04004KT 7SM BKN090 26/24 A3010 RMK
AO2 SLP193 T02610239 51011 TSNO=

201407050158 METAR KMRH 050158Z AUTO 03004KT 7SM SCT046 BKN055 BKN080
26/23 A3010 RMK AO2 SLP191 T02610233
TSNO=

201407050058 METAR KMRH 050058Z AUTO 00000KT 9SM FEW045 27/23 A3007 RMK
AO2 SLP184 T02720233 TSNO=

Hurricane Matthew: Mount Pleasant, South Carolina 2016

```
#####
# Query made at 05/28/2019 20:38:08 UTC
# Time interval: from 10/09/2016 00:00 to 10/09/2016 23:59 UTC
#####

#####
# METAR/SPECI from KLRO
#####
201610092355 METAR KLRO 092355Z AUTO 00000KT 10SM CLR 17/13 A3010 RMK
    AO2=
201610092335 METAR KLRO 092335Z AUTO 00000KT 10SM CLR 17/13 A3009 RMK
    AO2=
201610091855 METAR KLRO 091855Z AUTO 31013G18KT 10SM CLR 24/08 A3002 RMK
    AO2=
201610091815 METAR KLRO 091815Z AUTO 33013G19KT 10SM CLR 24/08 A3003 RMK
    AO2=
201610090915 METAR KLRO 090915Z AUTO 31007KT 10SM FEW050 19/15 A2993 RMK
    AO2=
201610090855 METAR KLRO 090855Z AUTO 31010G16KT 10SM FEW060 20/16 A2992
    RMK AO2=
201610090755 METAR KLRO 090755Z AUTO 31010KT 10SM FEW027 FEW035 SCT060
    21/17 A2990 RMK AO2=
201610090555 METAR KLRO 090555Z AUTO 32010G17KT 10SM FEW028 FEW040 BKN055
    22/18 A2986 RMK AO2=
201610090535 METAR KLRO 090535Z AUTO 32015G20KT 10SM FEW029 FEW037 BKN055
    22/18 A2986 RMK AO2=
201610090055 METAR KLRO 090055Z AUTO 31014G20KT 10SM FEW033 BKN041 22/18
    A2977 RMK AO2=
```

Hurricane Harvey: Houston, Texas 2017

```
#####
# Query made at 05/28/2019 21:09:24 UTC
# Time interval: from 08/27/2017 00:00 to 08/27/2017 23:59 UTC
#####
##### KHOU, Houston, Houston Hobby Airport (United States)
# WMO index: -----
# Latitude 29-38-15N. Longitude 095-16-57W. Altitude 14 m.
#####

#####
# METAR/SPECI from KHOU
#####
201708272353 METAR KHOU 272353Z 06009KT 8SM FEW014 SCT030 OVC065 27/24
    A2964 RMK AO2 SLP043 60103 T02670244
    10278 20256 56016 $=
201708272253 METAR KHOU 272253Z 07008KT 7SM SCT010 BKN042 OVC080 28/24
    A2966 RMK AO2 RAB00E09 SLP048 P0000
    T02780244 $=
201708272153 METAR KHOU 272153Z 11009KT 3SM FEW020 BKN039 OVC075 27/24
    A2967 RMK AO2 SFC VIS 8 RAE48 SLP050
    P0009 T02720244 $=
201708272053 METAR KHOU 272053Z 12008G16KT 2SM RA BR SCT013 BKN028 OVC045
    27/25 A2969 RMK AO2 SLP058 P0010
    60094 T02720250 56019 $=
201708271953 METAR KHOU 271953Z AUTO 05006KT 1SM +RA BR BKN009 BKN018
    OVC027 26/24 A2970 RMK AO2 LTG DSNT
    N AND NE SLP063 P0041 T02610239 $=
201708271853 METAR KHOU 271853Z 12009G16KT 1SM +RA BR BKN009 BKN015 OVC025
    26/24 A2973 RMK AO2 LTG DSNT E SLP073
    P0043 T02610239 $=
201708271753 METAR KHOU 271753Z 13006KT 3SM -RA BR SCT012 BKN023 OVC060
    26/24 A2975 RMK AO2 LTG DSNT N AND
    SE SLP078 P0036 60221 T02560239 10261
    20244 58008 $=
201708271653 METAR KHOU 271653Z 16012G24KT 1SM +RA BR SCT012 BKN022 OVC030
    25/23 A2977 RMK AO2 TSB24E41 SLP087
    P0085 T02500233 $=
201708271553 METAR KHOU 271553Z 12011KT 2SM RA BR SCT012 BKN020 OVC045
    26/24 A2977 RMK AO2 SLP084 P0015
    T02610239 $=
201708271453 METAR KHOU 271453Z 12010KT 4SM RA BR FEW008 BKN018 OVC023
```

26/24 A2977 RMK AO2 TSE48 SLP086
ASOS AUGMENTATION HAS BEEN RESUMED
P0063 60085 T02560239 50002 \$=

201708271353 METAR KHOU 271353Z 10007KT 10SM -TSRA BKN100 26/23 A2978
RMK AO2 SLP087 P0016 T02560233 \$=

201708271253 METAR KHOU 271253Z 13009KT 10SM -TSRA BKN013 BKN021 OVC039
26/23 A2977 RMK AO2 LTG DSNT N SLP086
P0006 T02560233 \$=

201708271153 METAR KHOU 271153Z 18007KT 150V220 4SM TSRA FEW007 BKN014
OVC025 26/24 A2977 RMK AO2 SLP084
P0036 60615 7/// T02560239 10261
20244 53007 \$=

201708271053 METAR KHOU 271053Z 12012G25KT 2 1/2SM +TSRA FEW012 BKN028
OVC050 25/23 A2974 RMK AO2 VIS 2
1/2V3 LTG DSNT ALQDS SLP074 P0096
T02500233 \$=

201708270953 METAR KHOU 270953Z VRB04KT 4SM +TSRA SCT009 BKN013 OVC033
24/23 A2974 RMK AO2 PK WND 18028/0917
LTG DSNT NE-S SLP076 P0194 T02440228
\$=

201708270853 METAR KHOU 270853Z 11007KT 1 1/4SM +TSRA BKN011 OVC017 25/24
A2977 RMK AO2 LTG DSNT NE-S SLP084
P0200 60289 T02500239 58016 \$=

201708270753 METAR KHOU 270753Z 11014G20KT 7SM +TSRA SCT009 BKN040CB OVC060
25/23 A2978 RMK AO2 LTG DSNT NE-S
SLP090 OCNL LTGICCG VC E-SE TS VC
E-SE MOV LTL *DUE TO AIRPORT CLOSURE
ASOS AUGMENTATION WILL STOP UNTIL
FURTHER NOTICE. P0065 \$=

201708270653 METAR KHOU 270653Z 14011KT 7SM -TSRA BKN014 BKN045CB OVC095
26/24 A2982 RMK AO2 LTG DSNT NE-SE
SLP101 OCNL LTGICCG VC E-SE TS VC
E-SE MOV LTL P0024 T02560239 \$=

201708270553 METAR KHOU 270553Z 13011G24KT 1/2SM +TSRA BKN009 OVC015CB
26/24 A2981 RMK AO2 PK WND 09032/0515
LTG DSNT ALQDS SLP100 OCNL LTGICCG
VC W AND E TS W AND E MOV LTL P0196
6/// T02560239 10294 20244 403000244
56019 \$=

201708270453 METAR KHOU 270453Z 12006KT 3SM +TSRA BR BKN007 BKN015CB OVC036
26/24 A2982 RMK AO2 PK WND 07033/0402
LTG DSNT NE-S SLP102 OCNL LTGICCG
VC E-SE TS VC E-SE MOV NE P0165 T02560239

201708270353 METAR KHOU 270353Z 12010G32KT 1/4SM +TSRA BKN005 OVC013CB
24/23 A2983 RMK AO2 PK WND 11041/0332

WSHFT 0258 LTG DSNT ALQDS SLP106

FRQ LTGICCG VC NE-SE TS VC NE-SE

MOV NE T02440233 PNO \$=

201708270253 METAR KHOU 270253Z 20013KT 1/4SM +TSRA FEW005 BKN009 OVC016CB

26/24 A2987 RMK AO2 PK WND 07026/0206

LTG DSNT ALQDS PRESRR SLP120 CONT

LTGICCG OHD ALQDS TS OHD ALQDS MOV

N P0123 60130 T02610239 53030=

201708270153 METAR KHOU 270153Z 07014G26KT 7SM -TSRA BKN015 BKN023CB OVC060

27/24 A2976 RMK AO2 PK WND 07030/0103

LTG DSNT ALQDS SLP084 CONT LTGICCG

VC SW-NW TS VC SW-NW MOV LTL P0005

T02670239=

201708270053 METAR KHOU 270053Z 08019G30KT 7SM -TSRA BKN015 BKN025CB OVC060

28/24 A2978 RMK AO2 PK WND 09030/0049

LTG DSNT S-NW RAB00 TSB29 SLP087

FRQ LTGICCG VC SW-NW TS VC SW-NW

MOV NE P0002 T02780244=

Hurricane Irma: Fort Myers, Florida 2017

```
#####
# Query made at 05/28/2019 20:58:45 UTC
# Time interval: from 09/11/2017 00:00 to 09/11/2017 23:59 UTC
#####
##### KRSW, Fort Myers, Southwest Florida International Airport (United States)
# WMO index: -----
# Latitude 26-31-37N. Longitude 081-45-59W. Altitude 9 m.
#####

#####
# METAR/SPECI from KRSW
#####
201709112353 METAR KRSW 112353Z 25007KT 10SM CLR 27/22 A2972 RMK AO2 SLP061
       60000 T02720222 10294 20272 53015=
201709112253 METAR KRSW 112253Z 27013G20KT 10SM SCT028 SCT035 28/22 A2971
       RMK AO2 SLP057 T02780217=
201709112153 METAR KRSW 112153Z 25015G21KT 10SM SCT028 SCT035 28/22 A2968
       RMK AO2 SLP049 T02830222=
201709112053 METAR KRSW 112053Z AUTO 25014G23KT 10SM FEW028 29/22 A2968
       RMK AO2 RAB13E27 SLP046 P0000 60000
       T02890222 55000=
201709111953 METAR KRSW 111953Z 25018KT 10SM SCT031 28/22 A2968 RMK AO2
       PK WND 25028/1916 SLP046 T02830222=
201709111853 METAR KRSW 111853Z 24014G21KT 10SM FEW030 SCT041 BKN055 28/23
       A2968 RMK AO2 PK WND 25026/1830 RAB34E49
       SLP046 P0000 T02780233=
201709111753 METAR KRSW 111753Z 25018G25KT 10SM SCT028 BKN035 BKN048 29/22
       A2968 RMK AO2 PK WND 24032/1706 SLP046
       60001 T02890222 10289 20261 51011=
201709111653 METAR KRSW 111653Z 24023G31KT 8SM FEW026 29/22 A2968 RMK
       AO2 PK WND 25032/1632 SLP046 T02890222=
201709111553 METAR KRSW 111553Z 24021KT 9SM FEW025 28/23 A2967 RMK AO2
       PK WND 23032/1458 RAB20E34 SLP045
       P0000 T02830228=
201709111453 METAR KRSW 111453Z 24021G27KT 10SM FEW040 SCT050 28/23 A2964
       RMK AO2 PK WND 25029/1414 SLP036
       60001 T02780228 51028=
201709111353 METAR KRSW 111353Z 24018G26KT 10SM FEW041 28/22 A2962 RMK
       AO2 PK WND 25026/1349 RAB02E16 SLP028
       P0001 T02780222=
201709111253 METAR KRSW 111253Z 24019KT 10SM BKN026 BKN031 27/23 A2960
```

RMK AO2 PK WND 25029/1211 SLP020
T02670228=

201709111153 METAR KRSW 111153Z 24018KT 9SM FEW026 27/23 A2956 RMK AO2
PK WND 24031/1100 SLP007 60013 70884
T02670228 10267 20244 53034=

201709111053 METAR KRSW 111053Z 23021G30KT 9SM FEW023 26/22 A2953 RMK
AO2 PK WND 23032/1006 SLP996 T02610222=

201709110953 METAR KRSW 110953Z 23022G31KT 10SM CLR 26/23 A2949 RMK AO2
PK WND 24037/0854 RAE26 SLP983 P0001
T02610228=

201709110853 METAR KRSW 110853Z 25023G36KT 5SM -RA SCT025 SCT033 BKN045
26/22 A2946 RMK AO2 PK WND 23036/0847
PRESRR SLP973 P0000 60012 T02610222
51066=

201709110753 METAR KRSW 110753Z 24024G36KT 3SM -RA FEW019 BKN046 OVC060
25/22 A2941 RMK AO2 PK WND 24047/0704
SLP955 P0009 T02500222=

201709110653 METAR KRSW 110653Z 25031G45KT 2 1/2SM -RA FEW018 BKN041 OVC110
25/22 A2934 RMK AO2 PK WND 25046/0616
SLP934 P0003 T02500222=

201709110553 METAR KRSW 110553Z 24034G47KT 1 1/4SM +RA BR BKN012 OVC016
24/24 A2926 RMK AO2 PK WND 24051/0531
PRESRR SLP907 P0009 60022 T02440239
10261 20244 51054=

201709110453 METAR KRSW 110453Z 24034G44KT 2SM RA BR BKN008 OVC014 25/24
A2918 RMK AO2 PK WND 23047/0441 PRESRR
SLP877 P0012 T02500239 402610233=

201709110353 METAR KRSW 110353Z 23026G32KT 6SM -RA OVC016 26/23 A2911
RMK AO2 PK WND 23034/0321 SLP854
P0000 T02610233=

201709110253 METAR KRSW 110253Z 25024G33KT 5SM -RA BR OVC014 26/23 A2900
RMK AO2 PK WND 24034/0218 PRESRR
SLP818 P0000 60001 T02560233 51108=

201709110153 METAR KRSW 110153Z 24025G36KT 5SM -RA BR OVC015 26/23 A2886
RMK AO2 PK WND 25041/0108 SLP772
P0000 T02560233=

201709110053 METAR KRSW 110053Z AUTO 25029G41KT 2SM -RA BR OVC013 26/23
A2868 RMK AO2 PK WND 25060/0002 VIS
1 1/4V3 PRESRR SLP709 P0001 T02560233
\$=

Hurricane Maria: San Juan, Puerto Rico 2017

```
#####
# Query made at 05/28/2019 21:14:31 UTC
# Time interval: from 09/21/2017 00:00 to 09/21/2017 23:59 UTC
#####
# TJSJ, San Juan, Luis Munoz Marin International Airport (United States)
# WMO index: -----
# Latitude 18-27N. Longitude 066-00W. Altitude 3 m.
#####

#####
# METAR/SPECI from TJSJ
#####
201709212156 METAR TJSJ 212156Z 14009G18KT 10SM -RA SCT030 BKN060 OVC090
          29/26 2978=
201709212056 METAR TJSJ 212056Z 14009G18KT 10SM SCT030 BKN045 OVC080 30/27
          2978=
```

Hurricane Florence: New Bern, North Carolina 2018

```
#####
# Query made at 05/28/2019 21:47:56 UTC
# Time interval: from 09/15/2017 00:00 to 09/15/2017 23:59 UTC
#####
##### KEWN, New Bern, Craven County Regional Airport (United States)
# WMO index: -----
# Latitude 35-04-03N. Longitude 077-02-50W. Altitude 5 m.
#####

#####
# METAR/SPECI from KEWN
#####
201709152354 METAR KEWN 152354Z 00000KT 10SM -RA FEW043 BKN055 24/23 A3006
    RMK AO2 RAB50 SLP178 P0000 60000
    T02440228 10306 20244 52007=
201709152254 METAR KEWN 152254Z 00000KT 10SM FEW042 FEW050 28/22 A3005
    RMK AO2 SLP175 T02780217=
201709152154 METAR KEWN 152154Z 10003KT 10SM SCT042 29/21 A3005 RMK AO2
    SLP174 T02890206=
201709152054 METAR KEWN 152054Z 00000KT 10SM SCT075 SCT090 30/21 A3004
    RMK AO2 SLP171 T03000206 55009=
201709151954 METAR KEWN 151954Z 21003KT 10SM CLR 30/19 A3003 RMK AO2 SLP168
    T03000194=
201709151854 METAR KEWN 151854Z 19004KT 10SM CLR 31/21 A3005 RMK AO2 SLP174
    T03060206=
201709151754 METAR KEWN 151754Z VRB03KT 10SM CLR 29/21 A3006 RMK AO2 SLP180
    T02940211 10294 20222 56011=
201709151654 METAR KEWN 151654Z 17003KT 10SM SCT030 29/22 A3007 RMK AO2
    SLP183 T02890217=
201709151554 METAR KEWN 151554Z VRB04KT 10SM CLR 28/22 A3009 RMK AO2 SLP187
    T02780222=
201709151454 METAR KEWN 151454Z 06004KT 10SM CLR 26/22 A3010 RMK AO2 SLP191
    T02610222 51010=
201709151354 METAR KEWN 151354Z 00000KT 7SM SCT007 25/22 A3009 RMK AO2
    SLP190 T02500222=
201709151254 METAR KEWN 151254Z 00000KT 4SM BR OVC005 23/22 A3008 RMK
    AO2 SLP187 T02280222=
201709151154 METAR KEWN 151154Z 00000KT 2 1/2SM BR OVC004 22/22 A3007
    RMK AO2 SLP181 70027 T02220222 10222
    20194 53022=
201709151054 METAR KEWN 151054Z 00000KT 6SM BR OVC005 21/21 A3004 RMK
```

AO2 SLP173 T02110211=
201709150954 METAR KEWN 150954Z 00000KT 5SM BR OVC006 20/20 A3001 RMK
AO2 SLP163 T02000200=
201709150854 METAR KEWN 150854Z AUTO 00000KT 5SM BR BKN100 20/20 A3000
RMK AO2 SLP159 T02000200 53004=
201709150754 METAR KEWN 150754Z AUTO 00000KT 2 1/2SM BR FEW002 21/21 A2999
RMK AO2 SLP155 T02060206=
201709150654 METAR KEWN 150654Z AUTO 00000KT 7SM BKN080 OVC110 21/21 A2999
RMK AO2 SLP155 T02110211=
201709150554 METAR KEWN 150554Z AUTO 00000KT 10SM BKN080 22/22 A2999 RMK
AO2 SLP156 60000 T02170217 10233
20217 58006=
201709150454 METAR KEWN 150454Z AUTO 19004KT 10SM OVC100 22/22 A3000 RMK
AO2 SLP158 T02220217 402940206=
201709150354 METAR KEWN 150354Z AUTO 00000KT 10SM OVC100 22/22 A3001 RMK
AO2 SLP162 T02220217=
201709150254 METAR KEWN 150254Z AUTO 28008KT 10SM SCT010 BKN025 OVC065
23/22 A3001 RMK AO2 SLP162 60000
T02280222 53013=
201709150154 METAR KEWN 150154Z AUTO 18004KT 10SM FEW060 SCT075 SCT090
22/22 A2999 RMK AO2 SLP156 T02220222=
201709150054 METAR KEWN 150054Z 18003KT 10SM FEW060 22/22 A2999 RMK AO2
RAE11 SLP154 P0000 T02220217=

Hurricane Michael: Apalachicola, Florida 2018

```
#####
# Query made at 05/28/2019 21:52:56 UTC
# Time interval: from 10/10/2017 00:00 to 10/10/2017 23:59 UTC
#####
##### KAAF, Apalachicola, Apalachicola (United States)
# WMO index: 72220
# Latitude 29-43-37N. Longitude 085-01-29W. Altitude 6 m.
#####
##### METAR/SPECI from KAAF
#####
201710102353 METAR KAAF 102353Z AUTO 00000KT 10SM CLR 27/26 A3004 RMK
    AO2 SLP170 T02670261 10306 20267
    51006=
201710102253 METAR KAAF 102253Z AUTO 19005KT 10SM BKN100 28/26 A3003 RMK
    AO2 SLP168 T02830256=
201710102153 METAR KAAF 102153Z AUTO 17005KT 10SM SCT014 28/26 A3003 RMK
    AO2 SLP168 T02830261=
201710102053 METAR KAAF 102053Z AUTO 15006KT 10SM FEW015 29/26 A3002 RMK
    AO2 SLP164 T02890261 56011=
201710101953 METAR KAAF 101953Z AUTO 12007KT 10SM FEW016 30/26 A3002 RMK
    AO2 LTG DSNT N SLP166 T03000261=
201710101853 METAR KAAF 101853Z AUTO 12008KT 10SM FEW016 30/26 A3004 RMK
    AO2 LTG DSNT NW SLP171 T03000261=
201710101753 METAR KAAF 101753Z AUTO 15009KT 10SM FEW016 30/27 A3005 RMK
    AO2 SLP175 T03000267 10306 20250
    58004=
201710101653 METAR KAAF 101653Z AUTO 12009KT 10SM SCT014 30/26 A3007 RMK
    AO2 SLP181 T03000261=
201710101553 METAR KAAF 101553Z AUTO 12008KT 10SM SCT012 SCT021 30/27
    A3007 RMK AO2 SLP183 T03000267=
201710101453 METAR KAAF 101453Z AUTO 07005KT 10SM BKN012 BKN019 28/27
    A3006 RMK AO2 SLP180 T02830267 50007=
201710101353 METAR KAAF 101353Z AUTO 04003KT 10SM BKN004 OVC014 27/27
    A3007 RMK AO2 CIG 002V009 SLP182
    T02670267=
201710101253 METAR KAAF 101253Z AUTO 05004KT 1/4SM FG VV002 26/26 A3005
    RMK AO2 SLP176 T02560256=
201710101153 METAR KAAF 101153Z AUTO 05005KT 1/4SM FG VV002 25/25 A3004
    RMK AO2 SLP173 T02500250 10267 20250
```

51012=

201710101053 METAR KAAF 101053Z AUTO 04003KT 1 1/4SM BR OVC002 26/26 A3002

RMK AO2 SLP166 T02560256=

201710100953 METAR KAAF 100953Z AUTO 02003KT 7SM BKN007 25/25 A3001 RMK

AO2 SLP161 T02500250 \$=

201710100853 METAR KAAF 100853Z AUTO 05003KT 6SM BR FEW008 26/26 A2999

RMK AO2 SLP156 T02560256 53002 \$=

201710100753 METAR KAAF 100753Z AUTO 11003KT 9SM FEW006 26/26 A2999 RMK

AO2 SLP154 T02610261 \$=

201710100653 METAR KAAF 100653Z AUTO 00000KT 9SM SCT006 27/27 A2999 RMK

AO2 SLP154 T02670267 \$=

201710100553 METAR KAAF 100553Z AUTO 14004KT 8SM FEW005 26/26 A2999 RMK

AO2 SLP153 T02610261 10272 20256

58005 \$=

201710100453 METAR KAAF 100453Z AUTO 12003KT 10SM FEW006 27/27 A2999 RMK

AO2 SLP155 T02670267 403060256 \$=

201710100353 METAR KAAF 100353Z AUTO 00000KT 10SM BKN007 26/26 A3000 RMK

AO2 SLP158 T02560256 \$=

201710100253 METAR KAAF 100253Z AUTO 00000KT 10SM FEW009 26/26 A3000 RMK

AO2 SLP159 T02610261 53013 \$=

201710100153 METAR KAAF 100153Z AUTO 18003KT 10SM CLR 27/26 A2999 RMK

AO2 SLP154 T02670261 \$=

201710100053 METAR KAAF 100053Z AUTO 00000KT 10SM CLR 27/26 A2998 RMK

AO2 SLP151 T02670261 \$=