Plan Aircraft Tracks (PATs) ver5.1 Atl-EPac version

Calculate Flight Latitude/Longitude Points and Duration

All Red Map Waypoints are draggable to New Locations

Great-circle distance between points using Haversine formula

http://met.nps.edu/~ldm/track/atlz

1-Points of Interest (8)
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25-27 Version 5.1 additions

July 30, 2015   *Please report all enhancements found to Bob   creasey@nps.edu*

Options/Overlays::>

| Point of Interest1: | 29.36N | , | 95.10W | LabelG | Ellington |
Point of Interest2:	37.85N	,	75.48W	LabelO	Wallops
Point of Interest3:	27.86N	,	82.52W	LabelP	McDill
Point of Interest4:	17.80N	,	64.80W	LabelR	St Croix
Point of Interest5:	32.36N	,	64.68W	LabelW	Bermuda
Point of Interest6:	31.81N	,	106.4W	LabelY	EL Paso Int
Point of Interest7:	37.077N	,	76.366W	LabelY	Langley
Point of Interest8:	33.889N	,	117.275W	March	March

1

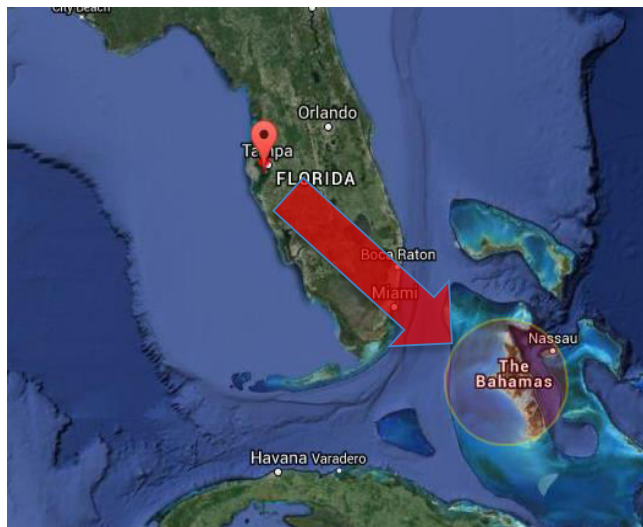Area of Interest1: 27.86N , 82.52W Radius (nm) 60

Area of Interest2: Lat(°N/S) , Lon(°E/W) Radius (nm) nm-radius

Area of Interest3: Lat(°N/S) , Lon(°E/W) Radius (nm) nm-radius
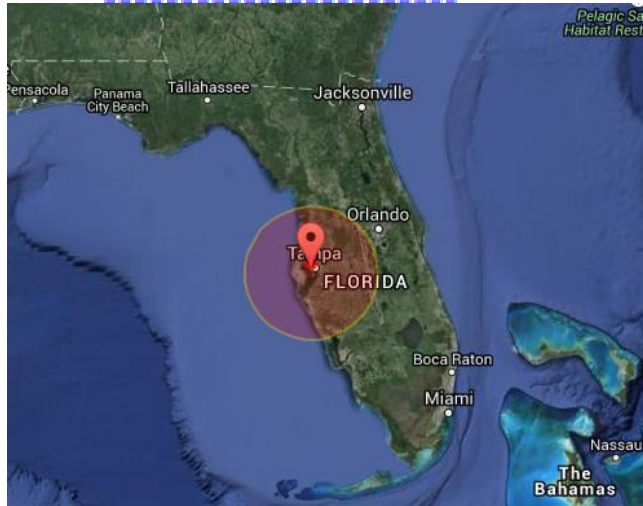
Area of Interest (1)= **-25.77 -145.02**, (2)= , (3)=

Area is draggable to other locations with Lat/Lon reporting at mouse placement locations

Area of Interest (1)= **24.10 -78.35**, (2)= , (3)=

Import KML-1 : Label COAMPS-TC track/intensity/min slp

- URL http://www.nrlmry.navy.mil/hs3CTCX/CTCX_track_latest.kml

Import KML-2 : Label NHC atcf kmz

- URL http://ftp.nhc.noaa.gov/atcf/gis/kmz/al012015.kmz

Import KML-3 : Label SEC-KML IR WV IR-NHC IR-BD

- URL http://tropic.ssec.wisc.edu/real-time/atlantic/images/kml/WV.kml

Import KML-10 : Label Google Site example Link using ver 4.8 Earl

- URL https://sites.google.com/site/tci2014nps/Pats-earl100912z-takeoff-wdrops-

KMLs (y/n) 1 N 2 y 3 N 4 N 5 N 6 N 7 N 8 N 9 N 10 N

Overlays On **K-2=> http://ftp.nhc.noaa.gov/atcf/gis/kmz/al012015.kmz**
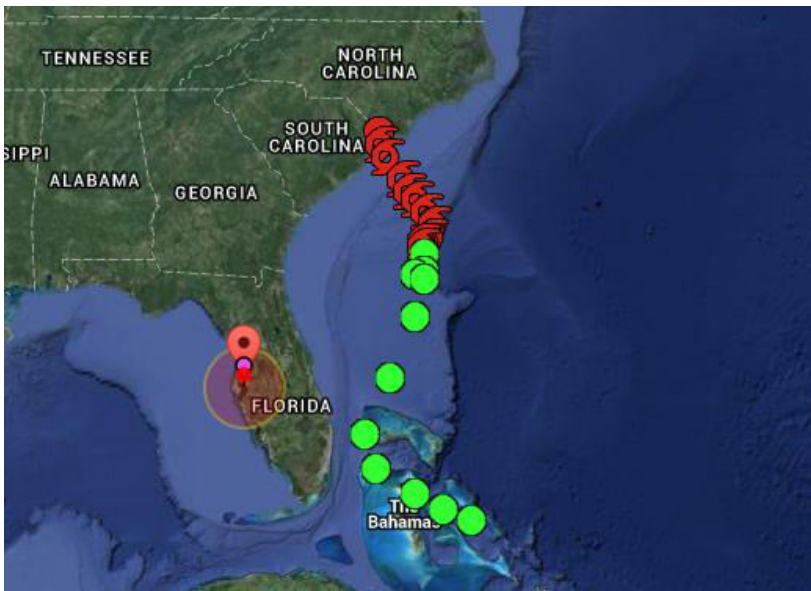
Ten KML/KMZ selections

- Selection (Y/N) on overlay bar
-KML must be on web server for PATs
-Google sites works well

3

Image Overlay1>   Label CIMSS Sat Winds AMV's with WVIR 100-500mb (-1,...-8 every3hr) 24hr

-                  URL http://tropic.ssec.wisc.edu/real-time/atlantic/winds/wg8wvir.GIF

-                  LL 2.52S   , 97.30W   UR 46.51N   , 32.80W
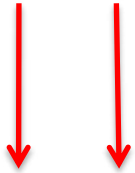
Image Overlay20>   Label Atlantic White Map overlay 1deg transparent

-                  URL http://met.nps.edu/~ldm/track/images/atlmapwhite1d.png
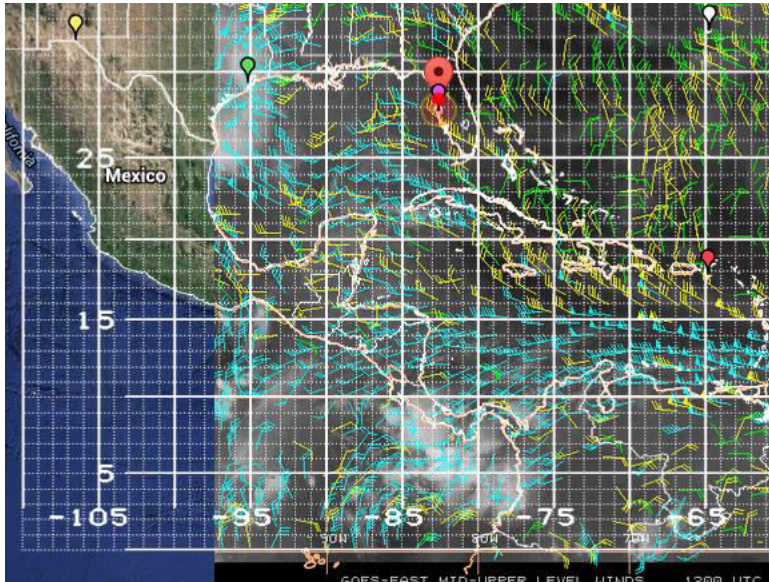
-                  LL 4.3S   , 124.20W   UR 75.00N   , 14.30E

Overlays (y/n) 1 y   2 N   3 n   4 N   5 N   6 N   7 N   8 N   9 N   10 N   11 N

Overlays (y/n) 12 N   13 N   14 N   15 N   16 N   17 N   18 N   19 N   20 y

Overlays On   O-1=> http://tropic.ssec.wisc.edu/real-time/atlantic/winds/wg8wvir.GIF
                O-20=> http://met.nps.edu/~ldm/track/images/atlmapwhite1d.png
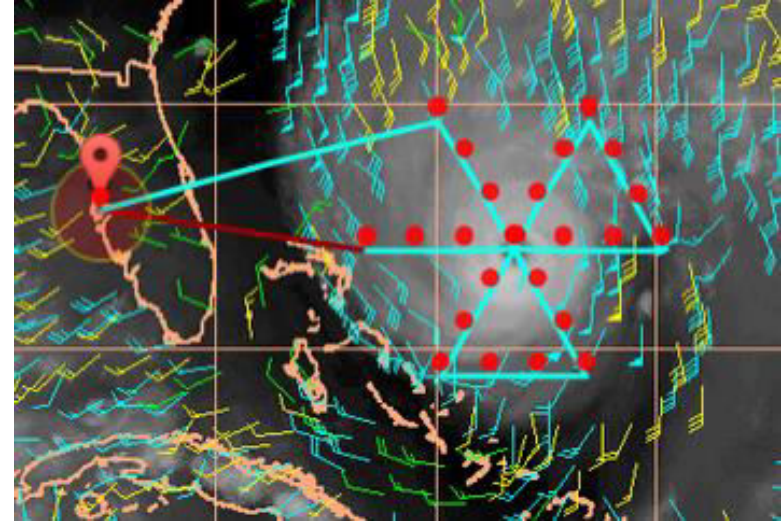

20 Image Overlay selections

 - *Selection (Y/N) on overlay bar*
 -*Images must be on web server for PATs*
   -*Google sites works well*
 -*Transparent white map overlay*
   -*useful for new image navigation*

Initial Setup

Storm info , Date/time , Pattern type

Initial Inputs::>

Start Current FLight: `27.849N` , `82.516W`

End Current FLight: `27.849N` , `82.516W`

Flight Speed (knots): Start `400.0`   Pattern `400.0`   Return `400.0`

Storm Movement >   **Web Link Calculator for Disance/Bearing from LL's**

Storm Current Center `27.08N` , `73.10W`   KML Label `Earl-10090200z`

Storm Forecast Loc: `27.08N` , `73.10W`   Label `Current 00z`

Forecast Time (UTC): Day `2` , Hour `0`   Label `Day , Hr UTC`

Flight Takeoff offset from Storm FCST `0` (hrs) Label `0 = Takeoff=FCST`

Storm Dir/Spd(Kts): `0` , `0`   Label `0's = No Moveme`

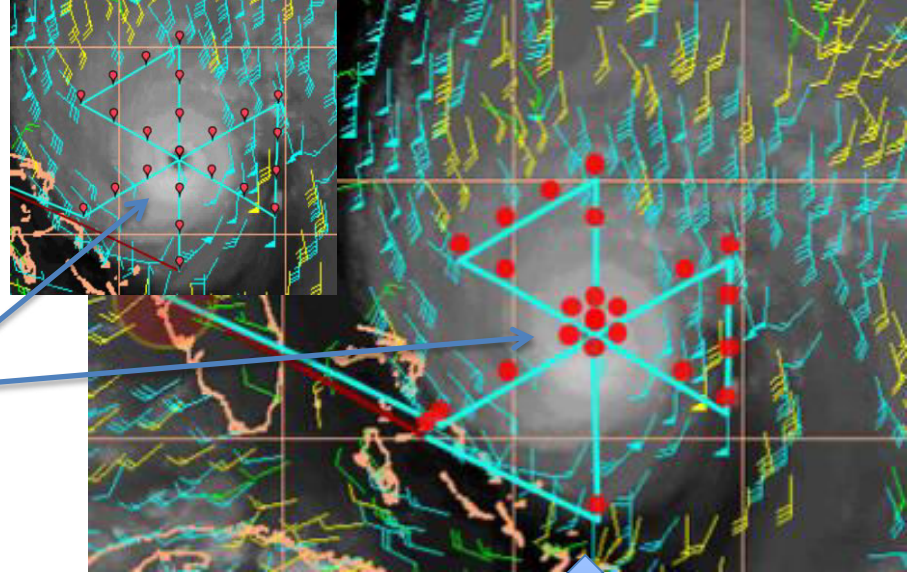**Pattern Type:>**   Num `5`   Rotation `0.0`   Scale `1.0`   TReverse `N`

Pattern Types::> 0=off, 1=LawnMower25(LM), 2=LM30, 3=SqrSpiral25 , 4=Alpha17 , 5=Bfly26 , 6=LM14 , 7=LM10 , 8=LM10 , 9=LM30 , 10=LM5

Flight Timing   **TakeOff 2/ 00:00:00 (UTC) On Pattern ->00:48:53 (UTC) Dur 0.815 (hr) Land->05:27:53 (UTC) Dur 5.46 (hr)**
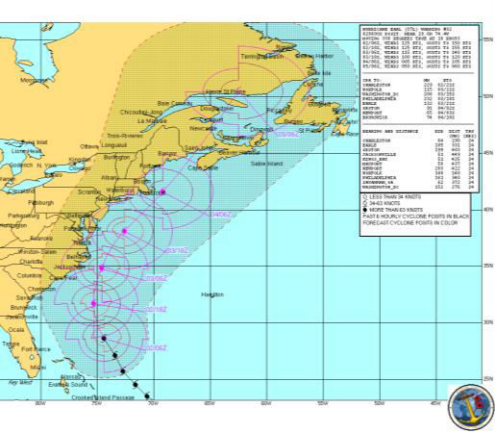
Adjustments

Storm Forecast,
Takeoff Time ,
Flight Duration,
Pattern type,
Way-Points

Initial Inputs::>

Start Current FLight:	27.849N	, 82.516W
End Current FLight:	27.849N	, 82.516W

Flight Speed (knots): Start 400.0 Pattern 400.0 Return 400.0

Storm Movement > **Web Link Calculator for Disance/Bearing from LL's**

Storm Current Center 27.08N , 73.10W KML Label Earl-10090200z

Current static storm position
- No times assigned
- Recent background info

Pattern type selected and adjusted

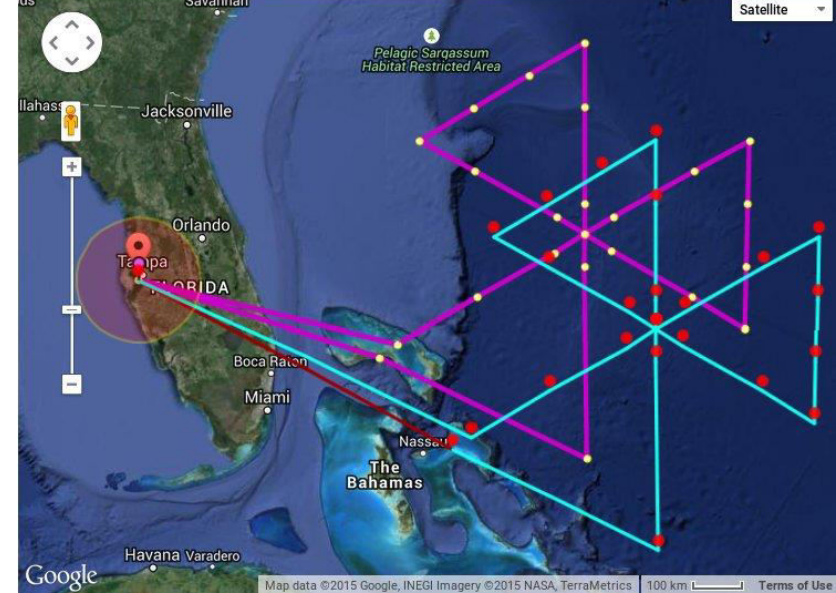| Pattern Type:>	Num 5	Rotation -90.0	Scale 1.0	TReverse N

Pattern Types::> 0=off, 1=LawnMower25(LM), 2=LM30, 3=SqrSpiral25 , 4=Alpha17 , 5=Bfly26 , 6=LM14 , 7=LM10 , 8=LM10 , 9=LM30 , 10=LM5

Flight Timing **TakeOff 2/ 00:00:00 (UTC) On Pattern ->01:23:26 (UTC) Dur 1.39 (hr) Land->05:56:04 (UTC) Dur 5.93 (hr)**

Adjustments

Storm Forecast,
Takeoff Time ,
Flight Duration,
Pattern type,
Way Points

KML output
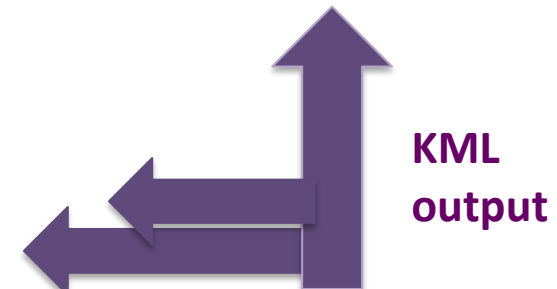
Forecast Loc and Time -translate to forecast location

Initial Inputs::>

Start Current FLight: | 27.849N | , | 82.516W

End Current FLight: | 27.849N | , | 82.516W

Flight Speed (knots): Start 400.0   Pattern 400.0   Return 400.0

Storm Movement > **Web Link Calculator for Disance/Bearing from LL's**

Storm Current Center | 27.08N | , | 73.10W | KML Label | Earl-10090200z

Storm Forecast Loc: | 28.6N | , | 74.4W | Label | Warning #32

Forecast Time (UTC): Day 2 , Hour 6   Label | Day , Hr UTC

Flight Takeoff offset from Storm FCST 0   (hrs) Label | 0 = Takeoff=FCST

Storm Dir/Spd(Kts): | 0 | , | 0 | Label | 0's = No Moveme
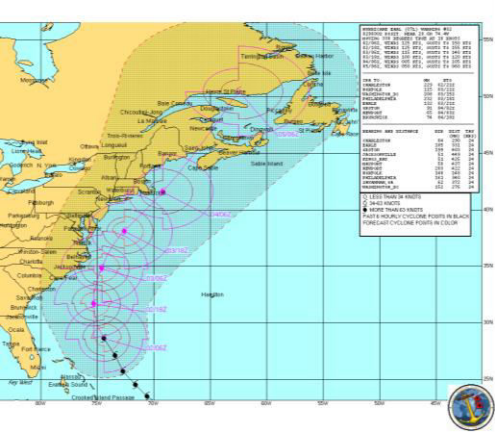
Pattern Type:> Num 5   Rotation -90   Scale 1.0   TReverse N

Pattern Types::> 0=off, 1=LawnMower25(LM), 2=LM30, 3=SqrSpiral25 , 4=Alpha17 , 5=Bfly26 , 6=LM14 , 7=LM10 , 8=LM10 , 9=LM30

Flight Timing **TakeOff 2/ 06:00:00 (UTC) On Pattern ->07:08:21 (UTC) Dur 1.14 (hr) Land->11:26:36 (UTC) Dur 5.44 (hr)**
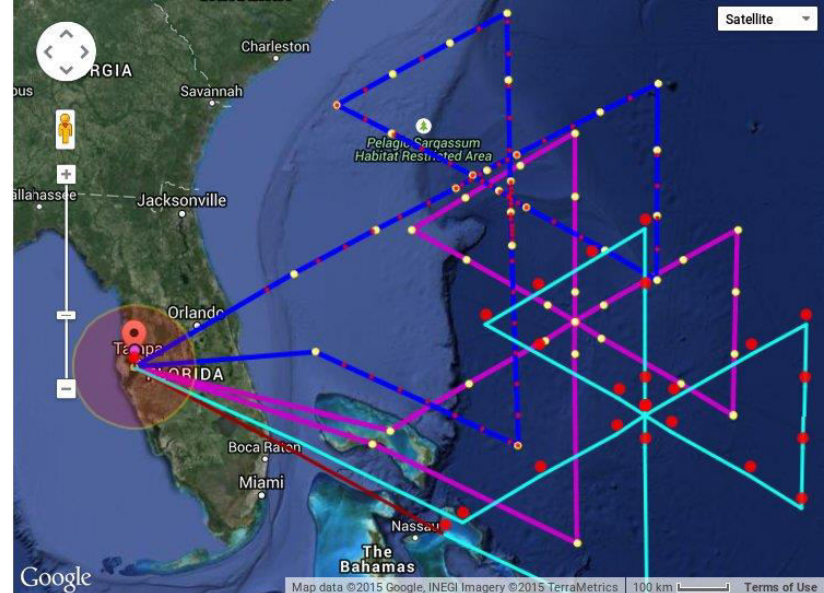
Note: Take Off time now 06z

Adjustments

Storm Forecast,
Takeoff Time ,
Flight Duration,
Pattern type,
Way Points

Final KML output Storm Relative

Adjust takeoff time

Initial Inputs::>

Start Current FLight:	27.849N	,	82.516W		
End Current FLight:	27.849N	,	82.516W		

Flight Speed (knots): Start 400.0   Pattern 400.0   Return 400.0

Storm Movement >   **Web Link Calculator for Disance/Bearing from LL's**

Storm Current Center   27.08N , 73.10W   KML Label Earl-10090200z

Storm Forecast Loc: 28.6N , 74.4W   Label Warning #32

Forecast Time (UTC):   Day 2 , Hour 6   Label Day , Hr UTC

Flight Takeoff offset   from Storm FCST 7   (hrs) Label 0 = Takeoff=FCST

Storm Dir/Spd(Kts):   330 , 16   Label 0's = No Moveme

Flight Timing   **TakeOff 2/ 13:00:00 (UTC) On Pattern ->13:25:60 (UTC) Dur 0.433 (hr) Land->18:13:28 (UTC) Dur 5.22 (hr)**

Takeoff adjustment to 13z

8
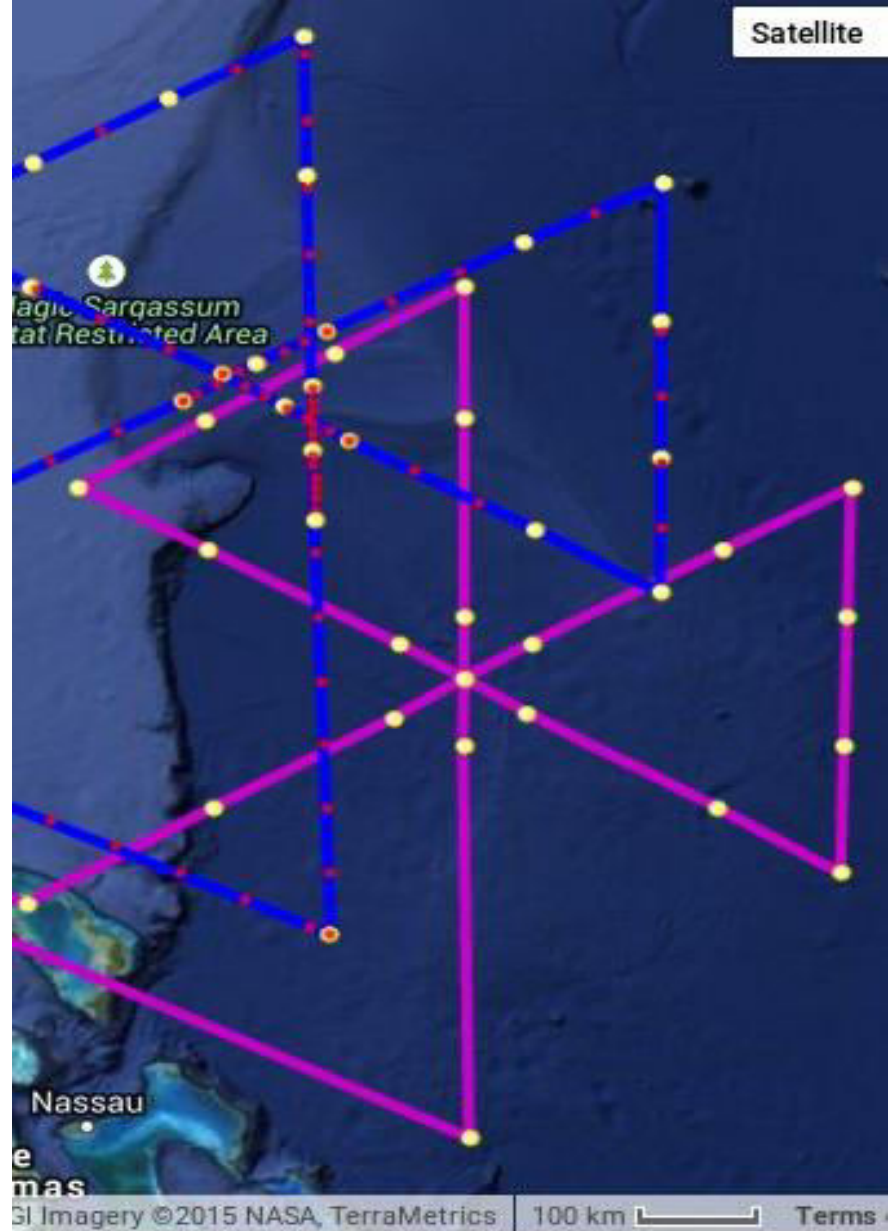
06Z with 6 hr translated storm forecast center purple kml (relates to images)
13Z with added 7.0 hr Storm Relative track 330deg @16knots blue   (relates to flight in storm)
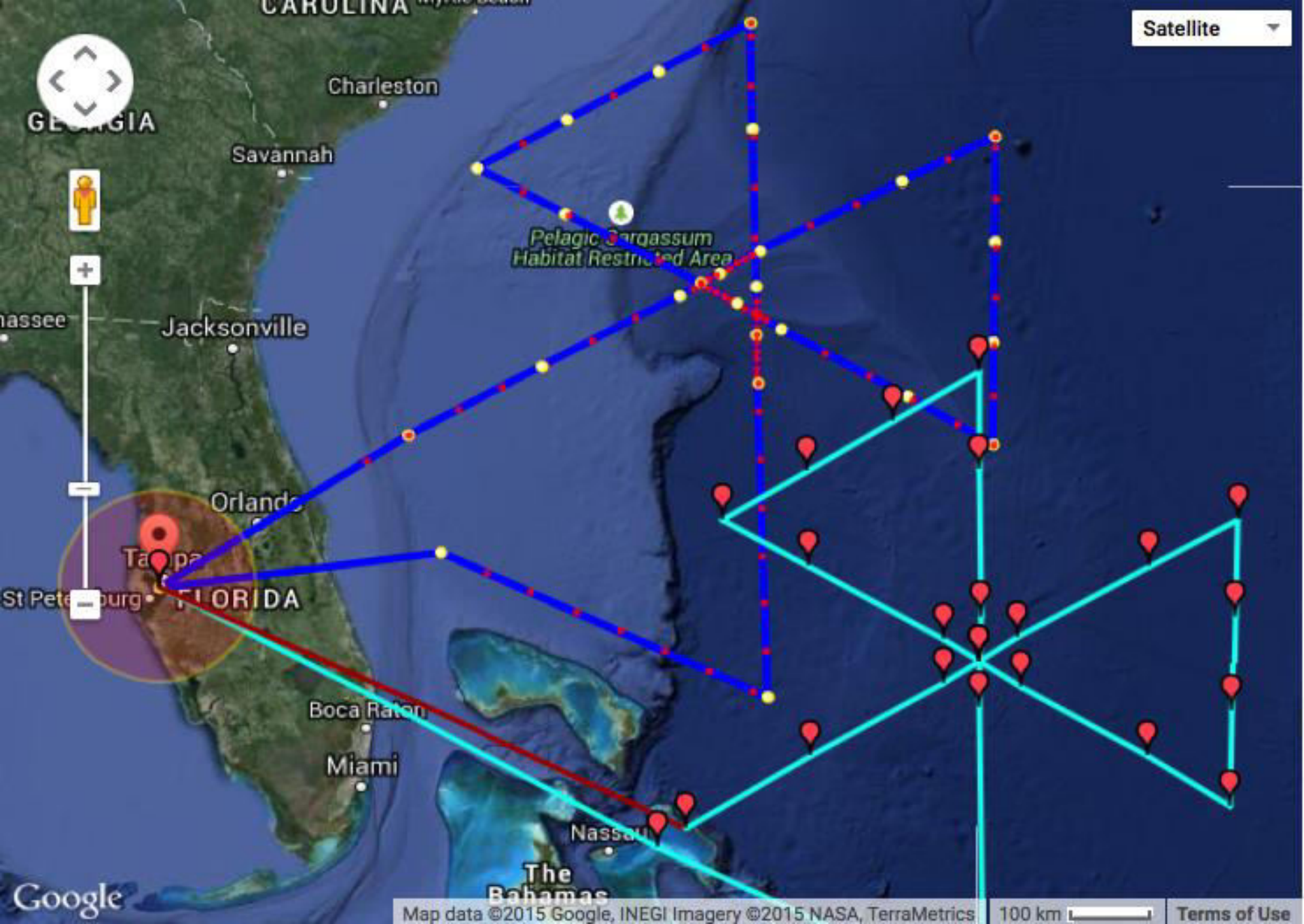**Note: storm center movement on passes**

9

HDSS Drop locations selection

- WP **S**tart number

- WP **E**nd number

- **Inc**rement between drops (nm)

- **Off**set (nm) prior to turns (turn>10deg)

- **MaxNum** allowed drops between selected WP
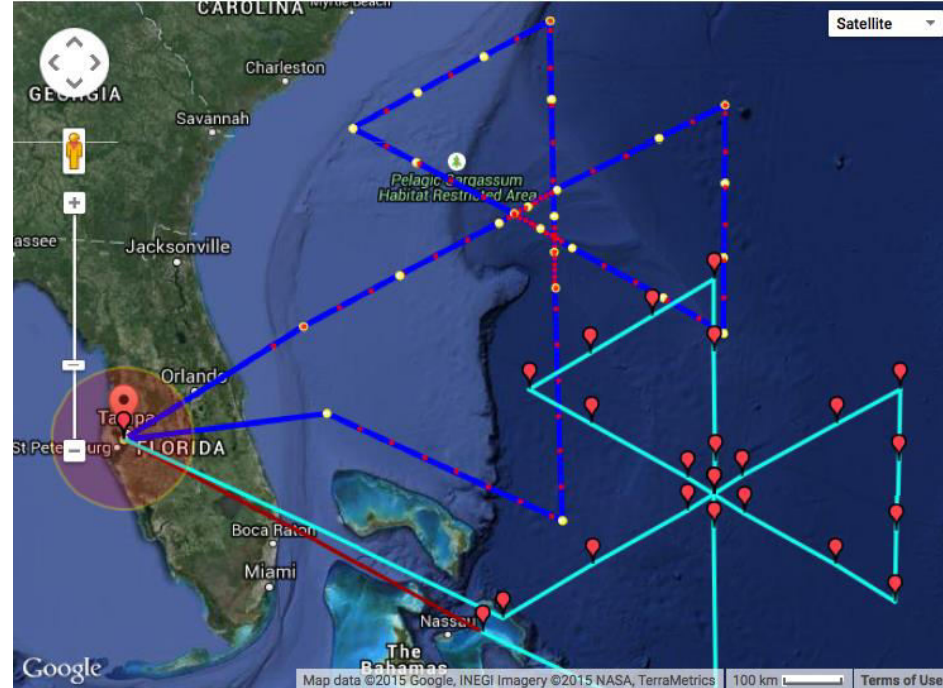
Drop set 1	S 1	E 3	Inc 30	Off 0	MaxNum 100
Drop set 2	S 3	E 5	Inc 5	Off 0	MaxNum 100
Drop set 3	S 5	E 12	Inc 30	Off 0	MaxNum 100
Drop set 4	S 12	E 14	Inc 5	Off 0	MaxNum 100
Drop set 5	S 14	E 21	Inc 30	Off 0	MaxNum 100
Drop set 6	S 21	E 23	Inc 5	Off 0	MaxNum 100
Drop set 7	S 23	E 25	Inc 30	Off 0	MaxNum 100
Drop set 8	S 25	E 26	Inc 30	Off 0	MaxNum 2
Drop set 9	S 1	E 1	Inc 10	Off 0	MaxNum 100
Drop set10	S 1	E 1	Inc 10	Off 0	MaxNum 100

Drop Stats

Drops-> WPS WPE Inc Off *Found **Possible (T Found) ((T Possible)) [[Max]]
Dropset-1 > 001 , 003 , 30.00 , 0.000 , * 015 ** 015 (015) ((015)) [[100]]
Dropset-2 > 003 , 005 , 5.000 , 0.000 , * 011 ** 011 (026) ((026)) [[100]]
Dropset-3 > 005 , 012 , 30.00 , 0.000 , * 017 ** 017 (043) ((043)) [[100]]
Dropset-4 > 012 , 014 , 5.000 , 0.000 , * 010 ** 010 (053) ((053)) [[100]]
Dropset-5 > 014 , 021 , 30.00 , 0.000 , * 017 ** 017 (070) ((070)) [[100]]
Dropset-6 > 021 , 023 , 5.000 , 0.000 , * 010 ** 010 (080) ((080)) [[100]]
Dropset-7 > 023 , 025 , 30.00 , 0.000 , * 006 ** 006 (086) ((086)) [[100]]
Dropset-8 > 025 , 026 , 30.00 , 0.000 , * 002 ** 006 (088) ((092)) [[002]]
Dropset-9 > 001 , 001 , 10.00 , 0.000 , * 000 ** 000 (088) ((092)) [[100]]
Dropset10 > 001 , 001 , 10.00 , 0.000 , * 000 ** 000 (088) ((092)) [[100]]

10
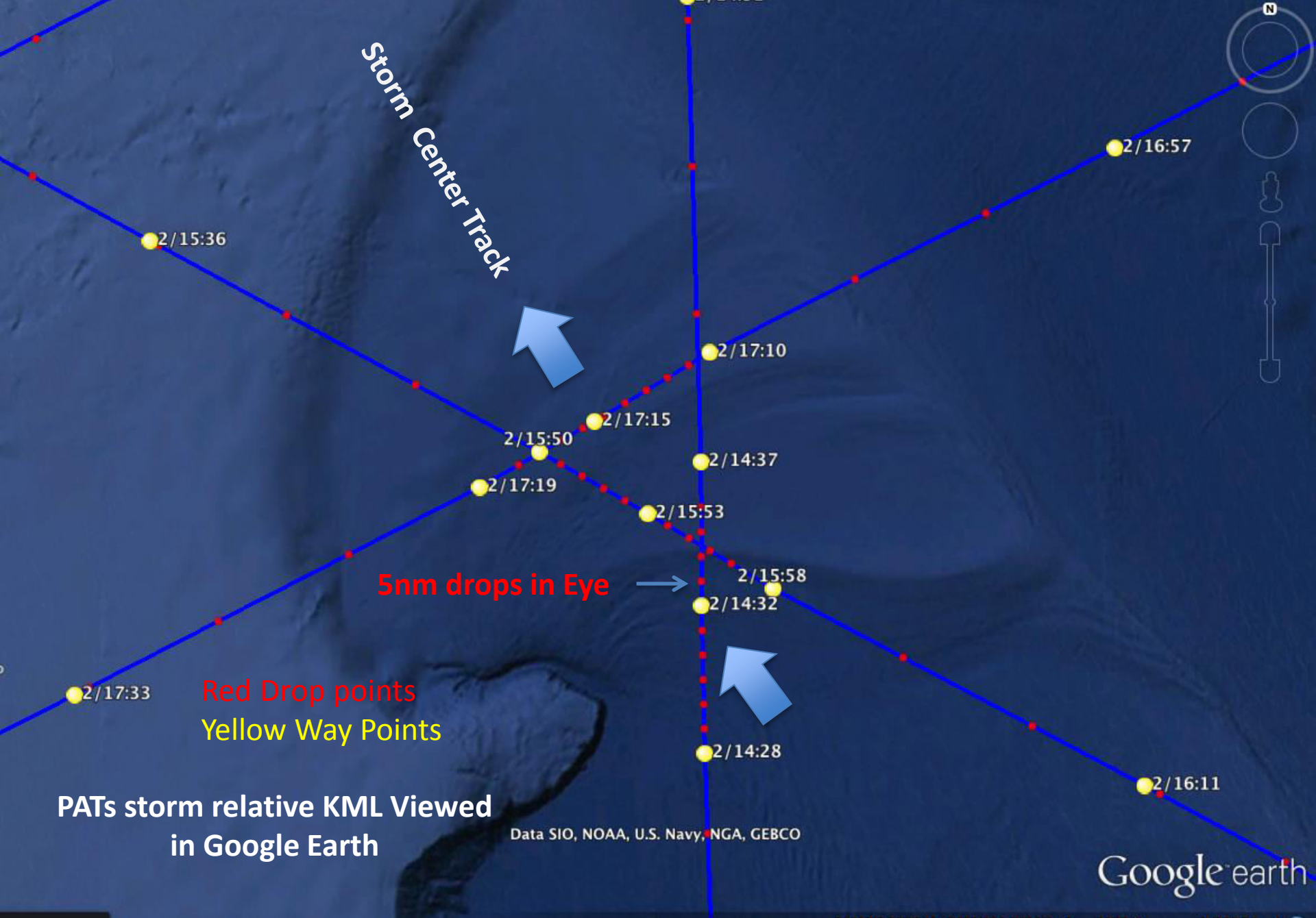
Storm Center Track

2/16:57

2/15:36

2/17:10

2/17:15

2/15:50

2/14:37

2/17:19

2/15:53

5nm drops in Eye →

2/15:58

2/14:32

2/17:33

Red Drop points
Yellow Way Points

2/14:28

2/16:11

**PATs storm relative KML Viewed
in Google Earth**

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google earth

Saving PATs KML as text file
upload to EOL, MTS, Google-Sites or view in Google Earth directly

http://met.nps.edu/~ldm/track/kml/Pats-earl100912z-takeoff-wdrops.kml

```
- - - - - - - - - - - Google Earth format: (Just cut and paste below kml to file and upload)- - - - - - - - - - -

<?xml version="1.0" encoding="UTF-8"?> <kml xmlns="http://earth.google.com/kml/2.2"> <Document>
<name>Track Plan </name>
<Style id="yellowball"> <IconStyle> <scale>0.5</scale> <Icon> <href>http://met.nps.edu/~ldm/track/images
/yellowball.png</href> </Icon> </IconStyle> </Style>
<Style id="redball"> <IconStyle> <scale>0.4</scale> <Icon> <href>http://met.nps.edu/~ldm/track/images/red-
ball.png</href> </Icon> </IconStyle> </Style>
<Style id="redLine"> <LineStyle> <color>ff0000ff</color> <width>4</width> </LineStyle> </Style>
<Style id="greenLine"> <LineStyle> <color>ff009900</color> <width>4</width> </LineStyle> </Style>
<Style id="blueLine"> <LineStyle> <color>ffff0000</color> <width>4</width> </LineStyle> </Style>
<Style id="purpleLine"> <LineStyle> <color>ffcc00cc</color> <width>4</width> </LineStyle> </Style>
<Style id="yellowLine"> <LineStyle> <color>ff61f2f2</color> <width>4</width> </LineStyle> </Style>

<Placemark> <name>Flight Storm Corrected </name> <styleUrl>#blueLine</styleUrl> <LineString> <coordi-
nates>

</coordinates> </LineString> </Placemark>

<!--- Optional Markers -->

User Input
Storm Corrected Flight Waypoints (WP)
Storm Corrected Flight Waypoints (DDD MM.mmm ) (>10deg Turns Only)
Storm Corrected Flight Waypoints DDD.ddddd (csv)(>10deg Turns Only
Storm Corrected Flight Waypoints DDD.ddddd (csv)(>10deg Turns Only (for MTS import OpsPlanning/Ruler )
Drops lat lon >>
Drops# , lat mm , lon mm , hh:mm (z) CARCAH >>
Drops# , lat , lon (for MTS import OpsPlanning/Ruler )
Drops Time (UTC) ,,,, lat: ,,,,, lon: ,,,, WP1,WP2
Initial Static Flight Path:
Flight Path Storm Bearing - Range info for pickpattern.js file if needed:

</pre> ]]> </description>
<Folder><name>WayPoints</name><visibility>0</visibility>
</Folder>
<Folder><name>Drops</name><visibility>0</visibility>
</Folder>
<!--- End Optional Markers -->


<!-- Required End -->
</Document> </kml>
```
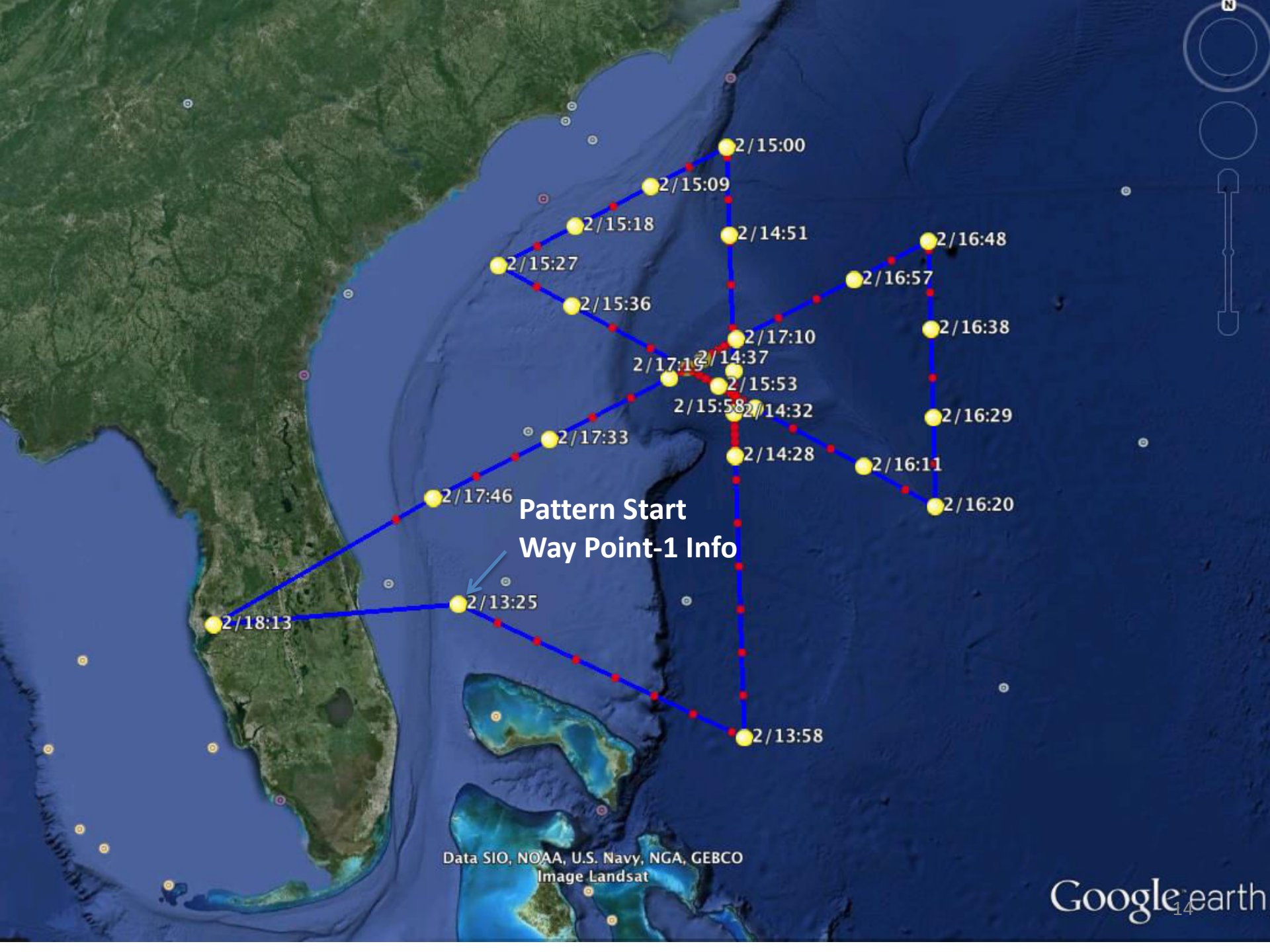
Cut and Paste Yourname.kml

From top
<?xml ......
to
</kml>
bottom

Note: All PATs user info included for WayPoint-1 viewing

Clicking Way Point 1 in KML provides full description of processing


```
2/13:25

User Input
Take Off--> 27.8490 -82.5160 2/ 13:00:00
Pattern Loc 25.0988 -76.7914 13:25:60 Dur 0.433
Landing Loc 27.8490 -82.5160 18:13:28 Dur 5.22
Flight Speed (Kts) 400.0 400.0 400.0
Storm Current Loc 27.0800 -73.1000 KML Label:Earl-10090200z
Storm FCST Loc 28.6000 -74.4000 Label:Warning #32
Storm FCST Time(hrs-UTC) 06:00:00 Label:
Flight Takeoff offset from FCST (hrs) 7.000 Label:
Storm FCST Dir and Speed(kts) 330.0/ 16.0 Label:
Pattern Num Rotation Scale Flip 21 0 1.0 N
Drops-> WPS WPE Inc Off *Found **Possible (T Found) ((T Possible)) [[Max]]
Dropset-1 > 001 , 003 , 30.00 , 0.000 , * 015 ** 015 ( 015 ) (( 015 )) [[ 100 ]]
Dropset-2 > 003 , 005 , 5.000 , 0.000 , * 011 ** 011 ( 026 ) (( 026 )) [[ 100 ]]
Dropset-3 > 005 , 012 , 30.00 , 0.000 , * 017 ** 017 ( 043 ) (( 043 )) [[ 100 ]]
Dropset-4 > 012 , 014 , 5.000 , 0.000 , * 010 ** 010 ( 053 ) (( 053 )) [[ 100 ]]
Dropset-5 > 014 , 021 , 30.00 , 0.000 , * 017 ** 017 ( 070 ) (( 070 )) [[ 100 ]]
Dropset-6 > 021 , 023 , 5.000 , 0.000 , * 010 ** 010 ( 080 ) (( 080 )) [[ 100 ]]
Dropset-7 > 023 , 025 , 30.00 , 0.000 , * 006 ** 006 ( 086 ) (( 086 )) [[ 100 ]]
Dropset-8 > 025 , 026 , 30.00 , 0.000 , * 002 ** 006 ( 088 ) (( 092 )) [[ 002 ]]
Dropset-9 > 001 , 001 , 10.00 , 0.000 , * 000 ** 000 ( 088 ) (( 092 )) [[ 100 ]]
Dropset10 > 001 , 001 , 10.00 , 0.000 , * 000 ** 000 ( 088 ) (( 092 )) [[ 100 ]]


Storm Corrected Flight Waypoints (WP)
TakeOff 2/ 13:00:00 (UTC) On Pattern ->13:25:60 (UTC) Dur 0.433 (hr) Land->18:13:28 (UTC) Dur 5.22 (hr)
PP ..WP....Time (UTC) .... Latd: ..... Lon: ... Dst-nm .. T-Dst .. Dur-hr
00 ZZZ00 , 2/13:00:00 , 27.849 , -82.516 , 0.0000 , 0.00000 , 0.00
01 ZZZ01 , 2/13:25:60 , 28.223 , -79.273 , 173.33 , 173.326 , 0.433
02 ZZZ02 , 2/13:58:58 , 26.699 , -75.522 , 219.76 , 393.089 , 0.983
03 --------- , 2/14:28:26 , 29.969 , -75.640 , 196.38 , 589.471 , 1.47
04 --------- , 2/14:32:56 , 30.469 , -75.652 , 30.016 , 619.487 , 1.55
05 --------- , 2/14:37:19 , 30.955 , -75.651 , 29.228 , 648.715 , 1.62
06 --------- , 2/14:51:33 , 32.536 , -75.698 , 94.924 , 743.640 , 1.86
07 ZZZ03 , 2/15:00:54 , 33.573 , -75.721 , 62.257 , 805.897 , 2.01
08 --------- , 2/15:09:56 , 33.103 , -76.783 , 60.259 , 866.156 , 2.17
09 --------- , 2/15:18:54 , 32.624 , -77.823 , 59.773 , 925.929 , 2.31
10 ZZZ04 , 2/15:27:54 , 32.140 , -78.859 , 60.043 , 985.972 , 2.46
11 --------- , 2/15:36:36 , 31.695 , -77.850 , 57.991 , 1043.96 , 2.61
12 --------- , 2/15:50:12 , 30.989 , -76.288 , 90.605 , 1134.57 , 2.84
13 --------- , 2/15:53:60 , 30.780 , -75.861 , 25.335 , 1159.90 , 2.90
14 --------- , 2/15:58:26 , 30.525 , -75.370 , 29.611 , 1189.51 , 2.97
15 --------- , 2/16:11:24 , 29.834 , -73.911 , 86.393 , 1275.91 , 3.19
16 ZZZ05 , 2/16:20:06 , 29.350 , -72.950 , 57.991 , 1333.90 , 3.33
17 --------- , 2/16:29:25 , 30.385 , -72.940 , 62.149 , 1396.05 , 3.49
18 --------- , 2/16:38:44 , 31.418 , -72.930 , 62.095 , 1458.14 , 3.65
19 ZZZ06 , 2/16:48:02 , 32.452 , -72.921 , 62.041 , 1520.18 , 3.80
20 --------- , 2/16:57:03 , 32.007 , -73.981 , 60.097 , 1580.28 , 3.95
21 --------- , 2/17:10:60 , 31.324 , -75.615 , 93.035 , 1673.32 , 4.18
22 --------- , 2/17:15:05 , 31.092 , -76.071 , 27.230 , 1700.55 , 4.25
23 --------- , 2/17:19:07 , 30.869 , -76.522 , 26.836 , 1727.38 , 4.32
```

Aircraft Requested format in KML at Way-Point 1

```
Storm Corrected Flight Waypoints (DDD MM.mmm ) (>10deg Turns Only)
ZZZ00 27 50.93 -82 30.96
ZZZ01 28 13.40 -79 16.38
ZZZ02 26 41.96 -75 31.30
ZZZ03 33 34.36 -75 43.27
ZZZ04 32 08.42 -78 51.56
ZZZ05 29 21.00 -72 56.99
ZZZ06 32 27.10 -72 55.28
ZZZ07 27 50.93 -82 30.96
Storm Corrected Flight Waypoints DDD.ddddd (csv)(>10deg Turns Only
ZZZ00 , 27.849000 , -82.516000
ZZZ01 , 28.223430 , -79.273115
ZZZ02 , 26.699498 , -75.521840
ZZZ03 , 33.572689 , -75.721179
ZZZ04 , 32.140497 , -78.859409
ZZZ05 , 29.350049 , -72.949832
ZZZ06 , 32.451764 , -72.921470
ZZZ07 , 27.849000 , -82.516000
Storm Corrected Flight Waypoints DDD.ddddd (csv)(>10deg Turns Only (for MTS import OpsPlanning/Ruler )
27.849000 , -82.516000
28.223430 , -79.273115
26.699498 , -75.521840
33.572689 , -75.721179
32.140497 , -78.859409
29.350049 , -72.949832
32.451764 , -72.921470
27.849000 , -82.516000
```
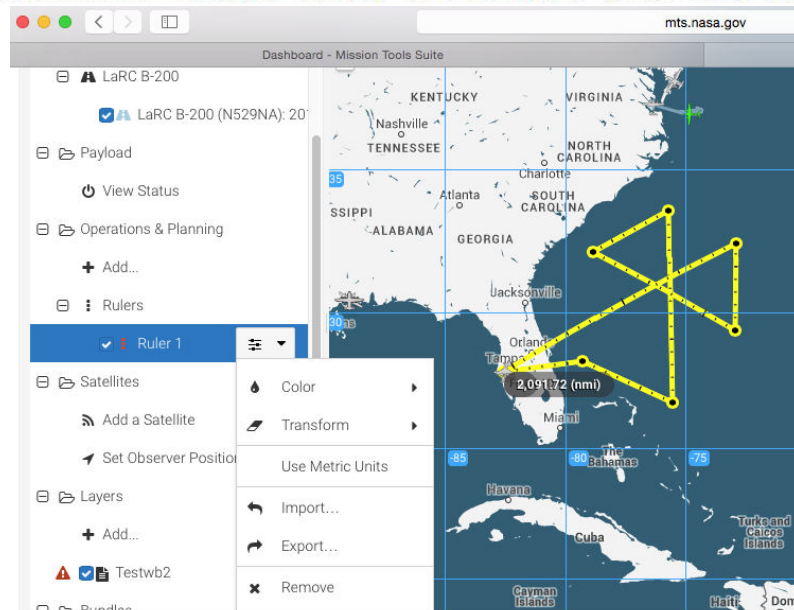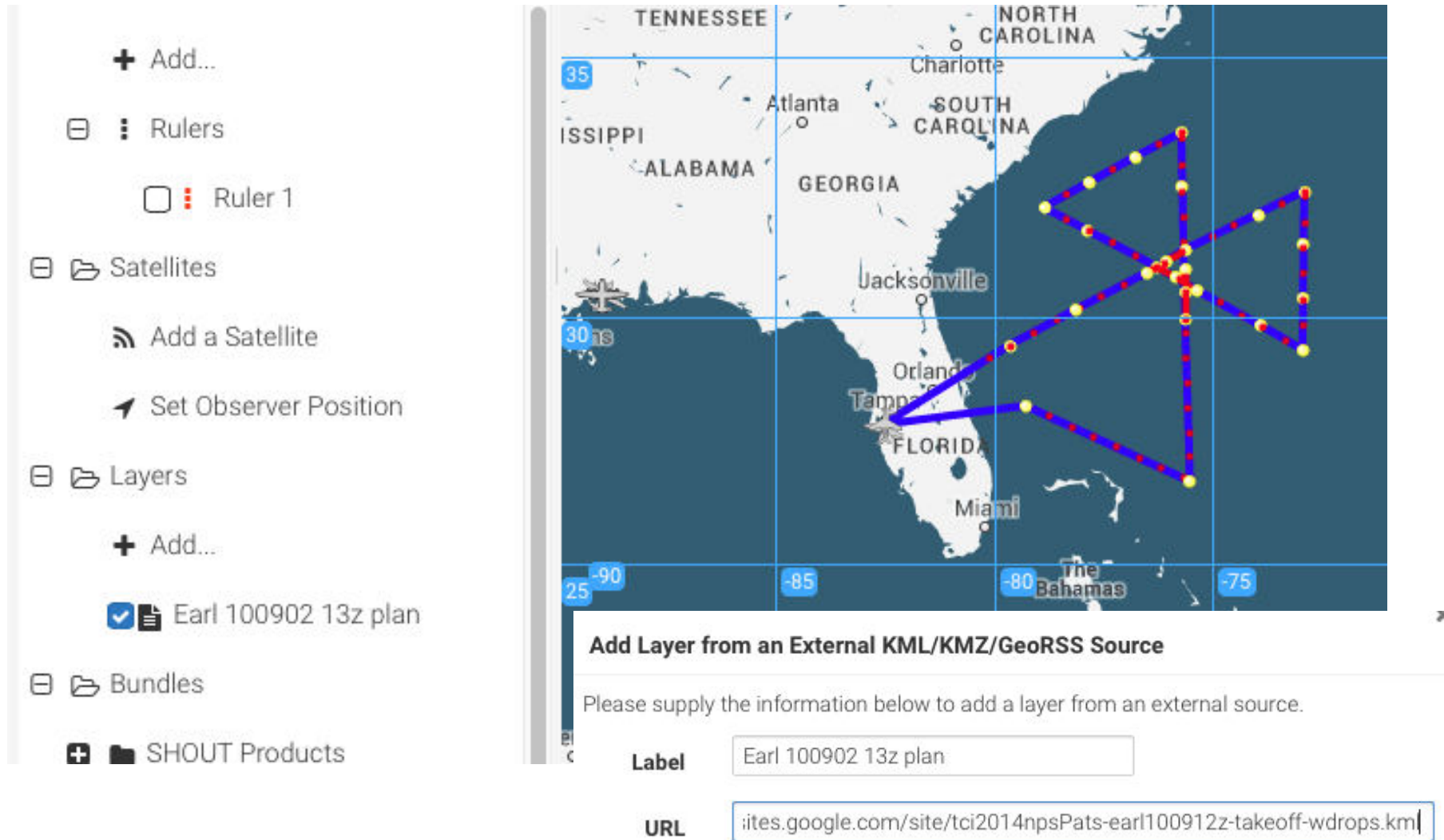

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PATs -> MTS local upload with Google Sites URL

KML has all Drop Locations/Times

```
Drops# , lat mm , lon mm , hh:mm (z) CARCAH >>
TakeOff 2/ 13:00:00 (UTC) On Pattern ->13:25:60 (UTC) Dur 0.433 (hr) Land->18:13:28 (UTC) Dur 5.22 (hr
001 , 28 13 , -79 16 , 13:25
002 , 28 01 , -78 45 , 13:30
003 , 27 49 , -78 14 , 13:34
004 , 27 36 , -77 43 , 13:39
005 , 27 24 , -77 12 , 13:43
006 , 27 11 , -76 42 , 13:48
007 , 26 58 , -76 11 , 13:52
008 , 26 46 , -75 41 , 13:57
009 , 26 41 , -75 31 , 13:58
010 , 27 11 , -75 32 , 14:03
011 , 27 41 , -75 33 , 14:07
012 , 28 11 , -75 34 , 14:12
013 , 28 41 , -75 35 , 14:16
014 , 29 11 , -75 36 , 14:21
015 , 29 41 , -75 37 , 14:25

Drops# , lat , lon (for MTS import OpsPlanning/Ruler
28.223430 , -79.273115
28.021406 , -78.754939
27.817447 , -78.238713
27.611575 , -77.724432
27.403815 , -77.212089
27.194189 , -76.701677
26.982722 , -76.193189
26.769438 , -75.686616
26.699498 , -75.521840
27.198914 , -75.539474
27.698328 , -75.557266
28.197739 , -75.575222
28.697148 , -75.593347
29.196554 , -75.611646

Drops Time (UTC) ,,,,, lat: ,,,,,, lon: ,,,, WP1,WP2
001 , 2/13:25:60 , 28.223 , -79.2731 , 01 , 02
002 , 2/13:30:30 , 28.021 , -78.7549 , 01 , 02
003 , 2/13:34:60 , 27.817 , -78.2387 , 01 , 02
004 , 2/13:39:30 , 27.612 , -77.7244 , 01 , 02
005 , 2/13:43:60 , 27.404 , -77.2121 , 01 , 02
006 , 2/13:48:30 , 27.194 , -76.7017 , 01 , 02
007 , 2/13:52:60 , 26.983 , -76.1932 , 01 , 02
008 , 2/13:57:30 , 26.769 , -75.6866 , 01 , 02
009 , 2/13:58:58 , 26.699 , -75.5218 , 02 , 03
010 , 2/14:03:28 , 27.199 , -75.5395 , 02 , 03
```

```
Drops lat lon >>
ZZZ001 , 28.223430 , -79.273115
ZZZ002 , 28.021406 , -78.754939
ZZZ003 , 27.817447 , -78.238713
ZZZ004 , 27.611575 , -77.724432
ZZZ005 , 27.403815 , -77.212089
ZZZ006 , 27.194189 , -76.701677
ZZZ007 , 26.982722 , -76.193189
ZZZ008 , 26.769438 , -75.686616
ZZZ009 , 26.699498 , -75.521840
ZZZ010 , 27.198914 , -75.539474
ZZZ011 , 27.698328 , -75.557266
ZZZ012 , 28.197739 , -75.575222
```

Adding Patterns to pickpatterns.js

- Download http://met.nps.edu/~ldm/track/kml/PATS-150710.tar
- tar -xvf PATS-150710.tar   creates folder ./pats with all files
- In Firefox File/Open-file   pats/atlz/index.html
- Note: pats/atlz/pickpattern.js
        which you can now edit and add your tracks
- Begin adding at ZCPAT == 30   patterns 0-29 are reserved
- -if you ever make an editing error
-    copy pickpattern.js.org150710 to pickpattern.js
    and start over
- // is used for comment lines in javascript

```
//////////////////////////////////////////////////////////
//////////////////////////////////////////////////////////
//////User adds pattern/////// ZCPAT== (pattern Num in PATS) ////
   if (ZCPAT == 30 ) {
//
// Enter Flight Path Storm Bearing - Range info here
// From PATs/KMl start with //Storm Current Center Lat-Lon...
//
```

Insert from kml ZCNUM[ZCPAT] = … Range Bearing information here

```
   };    //end
//////////////////////////////////////////////////////////
//////////////////////////////////////////////////////////
```

```
/////Earl 10090200z /////////Butterfly//////////////////
   if (ZCPAT == 21 ) {
//    ZCNUM[ZCPAT]  = 0; // number of points in pattern
ZCNUM[ZCPAT] = 25;
ZCBRG[1] = 239.9600;
ZCRNG[1] = 429.4132;
ZCBRG[2] = 179.3654;
ZCRNG[2] = 405.0711;
ZCBRG[3] = 180.5389;
ZCRNG[3] = 58.09567;
ZCBRG[4] = 270.0000;
ZCRNG[4] = 0.00001000000;
ZCBRG[5] = 360.0000;
ZCRNG[5] = 51.77296;
ZCBRG[6] = 360.0000;
ZCRNG[6] = 222.2000;
ZCBRG[7] = 360.0000;
ZCRNG[7] = 333.6000;
ZCBRG[8] = 340.8000;
ZCRNG[8] = 294.3000;
ZCBRG[9] = 319.1000;
ZCRNG[9] = 294.0000;
ZCBRG[10] = 300.0000;
ZCRNG[10] = 333.6000;
ZCBRG[11] = 300.0000;
ZCRNG[11] = 222.4000;
ZCBRG[12] = 301.2872;
ZCRNG[12] = 56.42311;
ZCBRG[13] = 270.0000;
ZCRNG[13] = 0.00001000000;
ZCBRG[14] = 122.1288;
ZCRNG[14] = 56.83663;
ZCBRG[15] = 120.0000;
ZCRNG[15] = 222.4000;
ZCBRG[16] = 120.0000;
ZCRNG[16] = 333.6000;
ZCBRG[17] = 100.8700;
ZCRNG[17] = 294.4000;
ZCBRG[18] = 79.10000;
ZCRNG[18] = 294.4000;
ZCBRG[19] = 60.00000;
ZCRNG[19] = 333.6000;
ZCBRG[20] = 60.00000;
ZCRNG[20] = 222.4000;
ZCBRG[21] = 59.62006;
ZCRNG[21] = 59.03432;
ZCBRG[22] = 270.0000;
ZCRNG[22] = 0.00001000000;
ZCBRG[23] = 237.5955;
ZCRNG[23] = 63.48596;
ZCBRG[24] = 240.0000;
ZCRNG[24] = 222.4000;
ZCBRG[25] = 240.3941;
ZCRNG[25] = 388.8390;

  };    //end ZCPAT=21
```

Insert from PATS/KML Range and Bearing information

Initial Inputs::>

Start Current FLight: `29.607N` , `95.159W`

End Current FLight: `29.607N` , `95.159W`

Flight Speed (knots): Start `400.0`   Pattern `400.0`   Return `400.0`

Storm Movement >   **Web Link Calculator for Disance/Bearing from LL's**

Storm Current Center `19.52N` , `108.4W`   KML Label `also GE-KML nan`

Storm Forecast Loc: `19.52N` , `108.4W`   Label `FCST Storm Cen`

Forecast Time (UTC): Day `13` , Hour `12`   Label `Day , Hr UTC`

Flight Takeoff offset   from Storm FCST `0`   (hrs) Label `0 = Takeoff=FCS`

Storm Dir/Spd(Kts): `0` , `0`   Label `0's = No Moveme`

Pattern Type:>   Num `8`   Rotation `-45`   Scale `1.0`   TReverse `N`

Pattern Types::>   0=off, 1=LawnMower25(LM), 2=LM30, 3=SqrSpiral25 , 4=Alpha17 , 5=Bfly26 , 6=LM14 , 7=LM10 , 8=LM10 , 9=LM30 , 10=LM5

Flight Timing   **TakeOff 13/ 12:00:00 (UTC) On Pattern ->14:03:17 (UTC) Dur 2.05 (hr) Land->17:28:25 (UTC) Dur 5.47 (hr)**

... Hide map

Modified Positions to be saved with Range/Bearing information in PATs
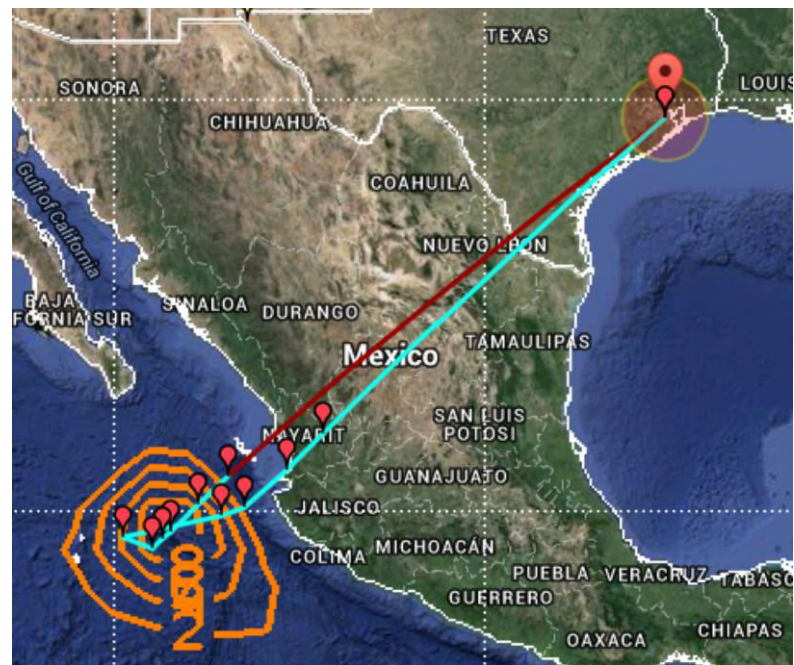
East Pac "Current Storm" example
Method for saving created track as PATs Flight Pattern
Flight Range and Bearing info at Way-Point 1 in KML

PATs KML has Range/Bearing info

Cut and paste

Add to PATs pats/atlz/pickpattern.js file
Refresh PATs Browser and view track

Creates pattern 30 in PATs

```
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
//////User adds pattern/////// ZCPAT== (pattern Num in PATS) //,
  if (ZCPAT == 30 ) {
//
// Enter Flight Path Storm Bearing - Range info here
// From PATs/KMl start with //Storm Current Center Lat-Lon...
//
// Storm Current Center Lat-Lon 19.52 , -108.4
ZCNUM[ZCPAT] = 10;
ZCBRG[1] = 45.00000;
ZCRNG[1] = 222.4000;
ZCBRG[2] = 45.00000;
ZCRNG[2] = 111.2000;
ZCBRG[3] = 90.00000;
ZCRNG[3] = 0.00001;
ZCBRG[4] = 230.8689;
ZCRNG[4] = 29.71169;
ZCBRG[5] = 229.7424;
ZCRNG[5] = 68.69665;
ZCBRG[6] = 263.6598;
ZCRNG[6] = 134.4749;
ZCBRG[7] = 70.95471;
ZCRNG[7] = 147.5714;
ZCBRG[8] = 71.48265;
ZCRNG[8] = 214.6050;
ZCBRG[9] = 61.44457;
ZCRNG[9] = 368.5867;
ZCBRG[10] = 56.46898;
ZCRNG[10] = 501.7344;

  };    //end
```

Flight Path Storm Bearing - Range info for pickpattern.js file if needed:
```
// Storm Current Center Lat-Lon 19.52 , -108.4
ZCNUM[ZCPAT] = 10;
ZCBRG[1] = 45.00000;
ZCRNG[1] = 222.4000;
ZCBRG[2] = 45.00000;
ZCRNG[2] = 111.2000;
ZCBRG[3] = 90.00000;
ZCRNG[3] = 0.00001;
ZCBRG[4] = 230.8689;
ZCRNG[4] = 29.71169;
ZCBRG[5] = 229.7424;
ZCRNG[5] = 68.69665;
ZCBRG[6] = 263.6598;
ZCRNG[6] = 134.4749;
ZCBRG[7] = 70.95471;
ZCRNG[7] = 147.5714;
ZCBRG[8] = 71.48265;
ZCRNG[8] = 214.6050;
ZCBRG[9] = 61.44457;
ZCRNG[9] = 368.5867;
ZCBRG[10] = 56.46898;
ZCRNG[10] = 501.7344;
```

Storm current center needs to be set to 19.52n, -108.4w in PATs. Also, rotations, and scale to 0

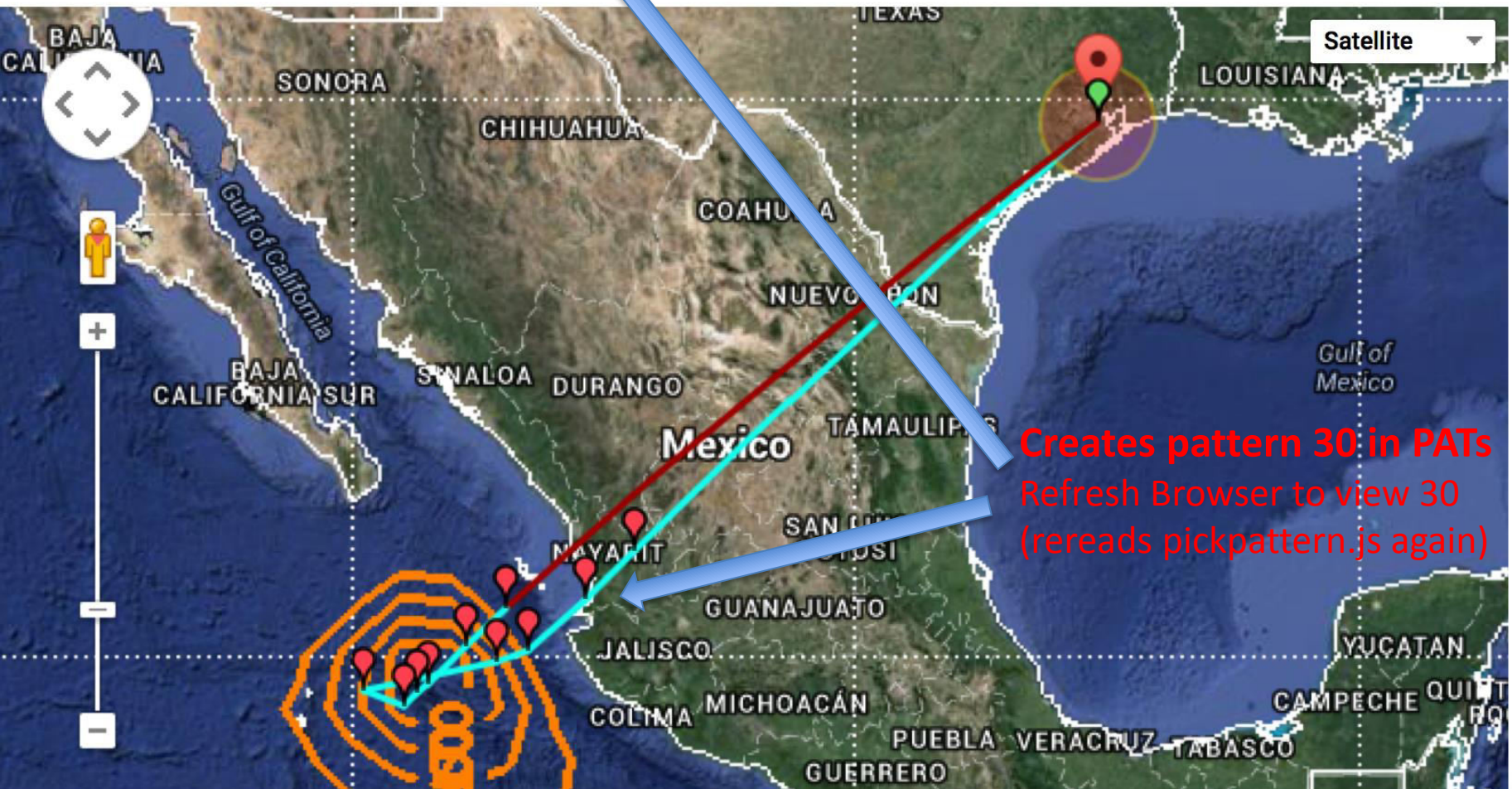Pattern Type:>   Num 30   Rotation 0   Scale 1.0   TReverse N

Pattern Types::> 0=off, 1=Lawn Mower25(LM), 2=LM30, 3=SqrSpiral25 , 4=Alpha17 , 5=Bfly26 , 6=LM14 , 7=LM10 , 8=LM10 , 9=LM10 , 10=LM5

Flight Timing **TakeOff 13/ 12:00:00 (UTC) On Pattern ->14:03:17 (UTC) Dur 2.05 (hr) Land->17:07:37 (UTC) Dur 5.13 (hr)**

... Hide map

Creates pattern 30 in PATs
Refresh Browser to view 30
(rereads pickpattern.js again)

EOL Field Catalog
with uploaded Bill KML from PATs

NASA MTS
with Bill uploaded KML from PATs

PATs 5.1 Additions

- Fixed waypoint corridor options

- Map Current/Fcst Center Markers

- Map Viewable Range Bearing Options

Storm Relative flight plan with optional fixed Corridor points

Normal Storm Relative Flight

Pattern Num 4 Rotation 150.0 Scale .6 TReverse N Corridor-Outnum 0 Innum 0

- Option will allow fixed flight through Mexico if required
- Remaining Way-Points still storm relative
- Can add some time to flight
- Usage:

Pattern Num 4 Rotation 150.0 Scale .6 TReverse N Corridor-Outnum 1 Innum 1

Outnum = number of WP's outbound to fix (default=0)
Innum = number of WP's inbound to fix   (default=0)

Green Lines = Possible Corridors (kml-7 overlay)

Corridor Flight (1 point fixed)
Other WPs Storm Relative

Pattern Num 4 Rotation 150.0 Scale .6 TReverse N Corridor-Outnum 1 Innum 1
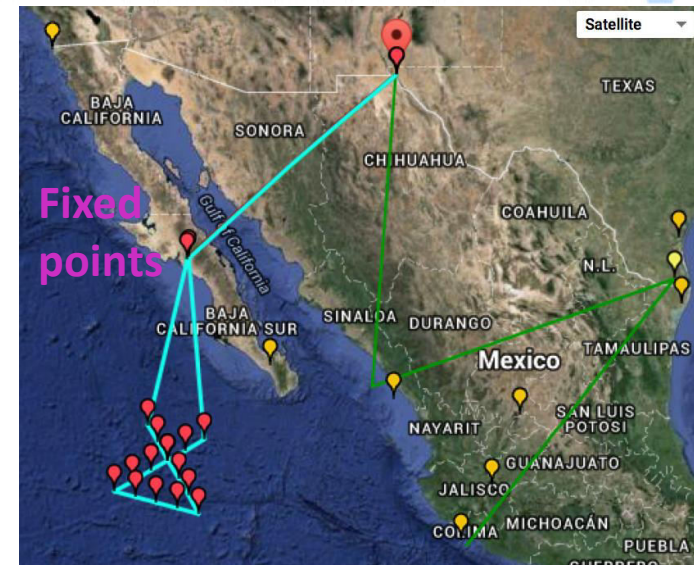
Fixed points

Storm moving
330deg at 10kt
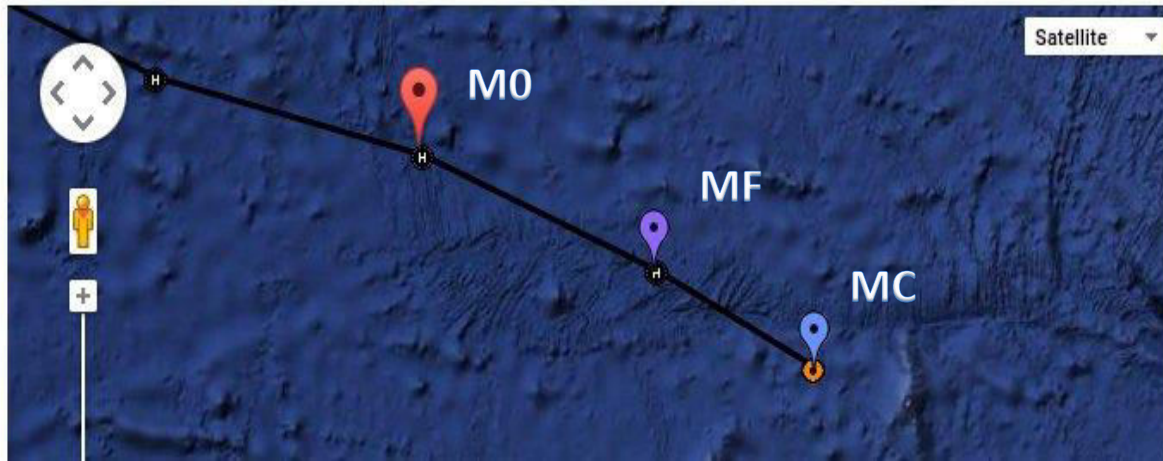
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Range Bearing Markers

Markers   Range-Bearing: MC-MF -> 80.89nm , 41.9deg , MF-M0 -> 484.2nm , 298deg , MC-M0 -> 471.4nm , 308deg

... Hide map

Markers   Range-Bearing: MC-MF -> 65.82nm , 299deg , MF-M0 -> 92.87nm , 295deg , MC-M0 -> 158.6nm , 297deg

... Hide map

Initial Markers:

- **MC Blue = Storm Current Center**
- **MF Purple = Forecast Center**
- **M0 Red = Take Off Point**

- **Range-Bearing for:**
- **MC to MF**
- **MF to M0**
- **MC to M0**

- Markers are draggable and provide instant range-bearing information.

- Easy Speed and Direction calculation for storm or measurement on a feature

- Note: Dragging MC & MF does not change "Storm Current Center" or "Forecast Center" locations used in PATs