



Integrating Wind Profiling Radars and Radiosonde Observations with Model Point Data to Develop a Decision Support Tool to Assess Upper-level Winds For Space Launch

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Outline

- Problem
- Data
 - Observations
 - Model Point Data
- Graphical User Interface (GUI)
 - Model Initialization
 - Model Forecasts
 - Profilers
 - Rawinsonde
- Conclusions



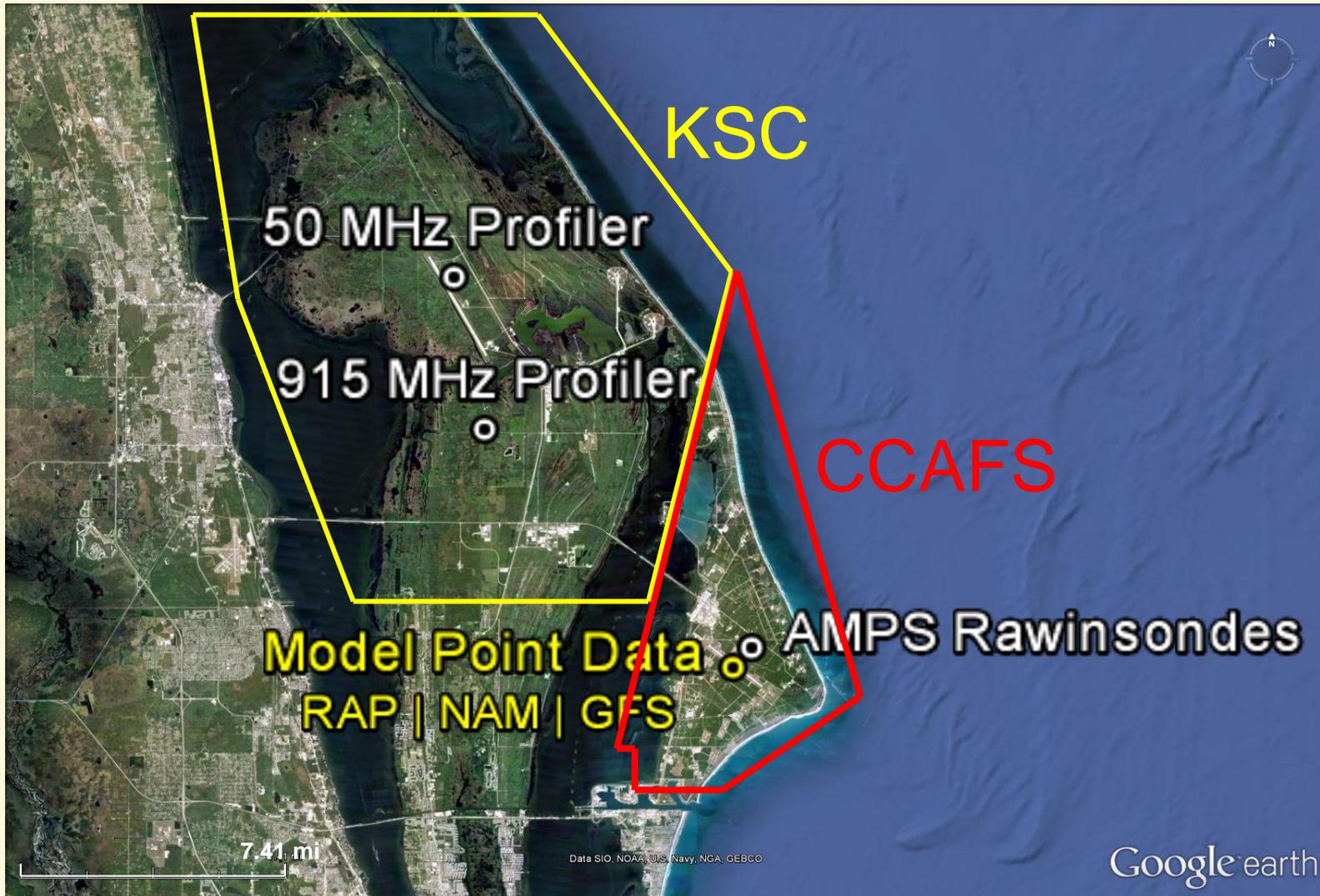
Problem

- Launch Directors
 - Want to know upper-level wind forecasts during launch countdown
 - Steering, aerodynamic loads and trajectory
- Launch Weather Officers
 - Should be able to provide the forecasts
 - Limited capability
- Solution
 - Develop GUI
 - Overlay vertical profiles of observations and model data

Keep these folks informed



Observations & Model Data



- Launch Weather Officers requested Excel GUI
 - Windows PC workstation located in Range Weather Operations
- All code written in Visual Basic for Applications



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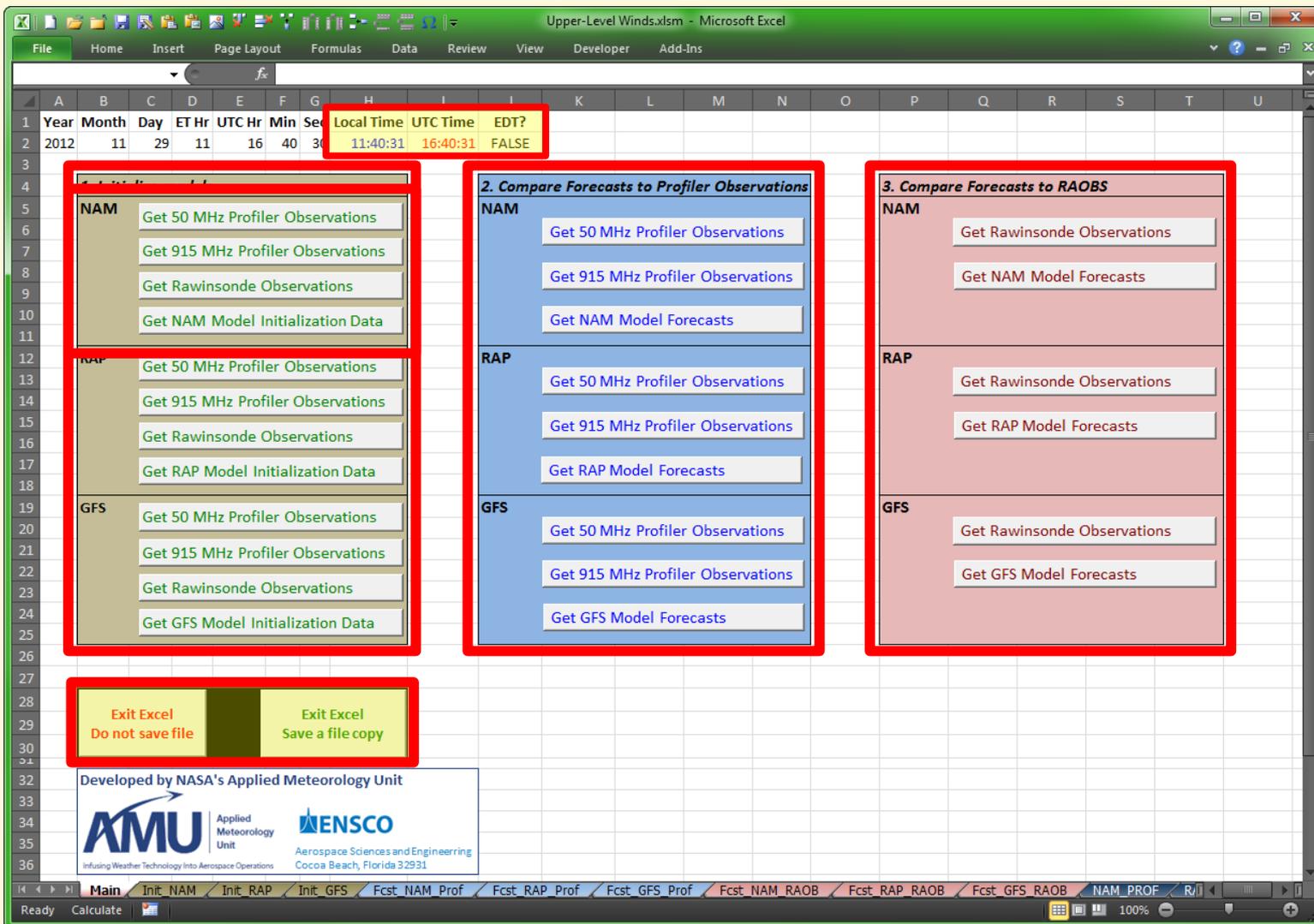
Dim charName$
Dim pMax As Long

Sheets("RAOB_GFS").Select

' Create header labels
Range("B1") = "Sensor:"
Range("B2") = "Location:"
Range("B3") = "Date:"
Range("B4") = "Time:"
Range("C5") = "Height (ft)"
Range("D5") = "Direction"
Range("E5") = "Speed (kts)"

' Get header information from raw data
charName$ = Mid(Worksheets("RAOB_GFS").Range("A9"), 12, 6) ' Gets the instrument RAOB (AMP/LR)
charTme$ = Mid(Worksheets("RAOB_GFS").Range("A11"), 1, 5) ' Gets the UTC time of the RAOB Observation
charDate$ = Mid(Worksheets("RAOB_GFS").Range("A11"), 8, 9) ' Gets the year of the RAOB Observation
  
```

GUI



Upper-Level Winds.xlsm - Microsoft Excel

Year	Month	Day	ET Hr	UTC Hr	Min Set	Local Time	UTC Time	EDT?	
2012	11	29	11	16	40	3	11:40:31	16:40:31	FALSE

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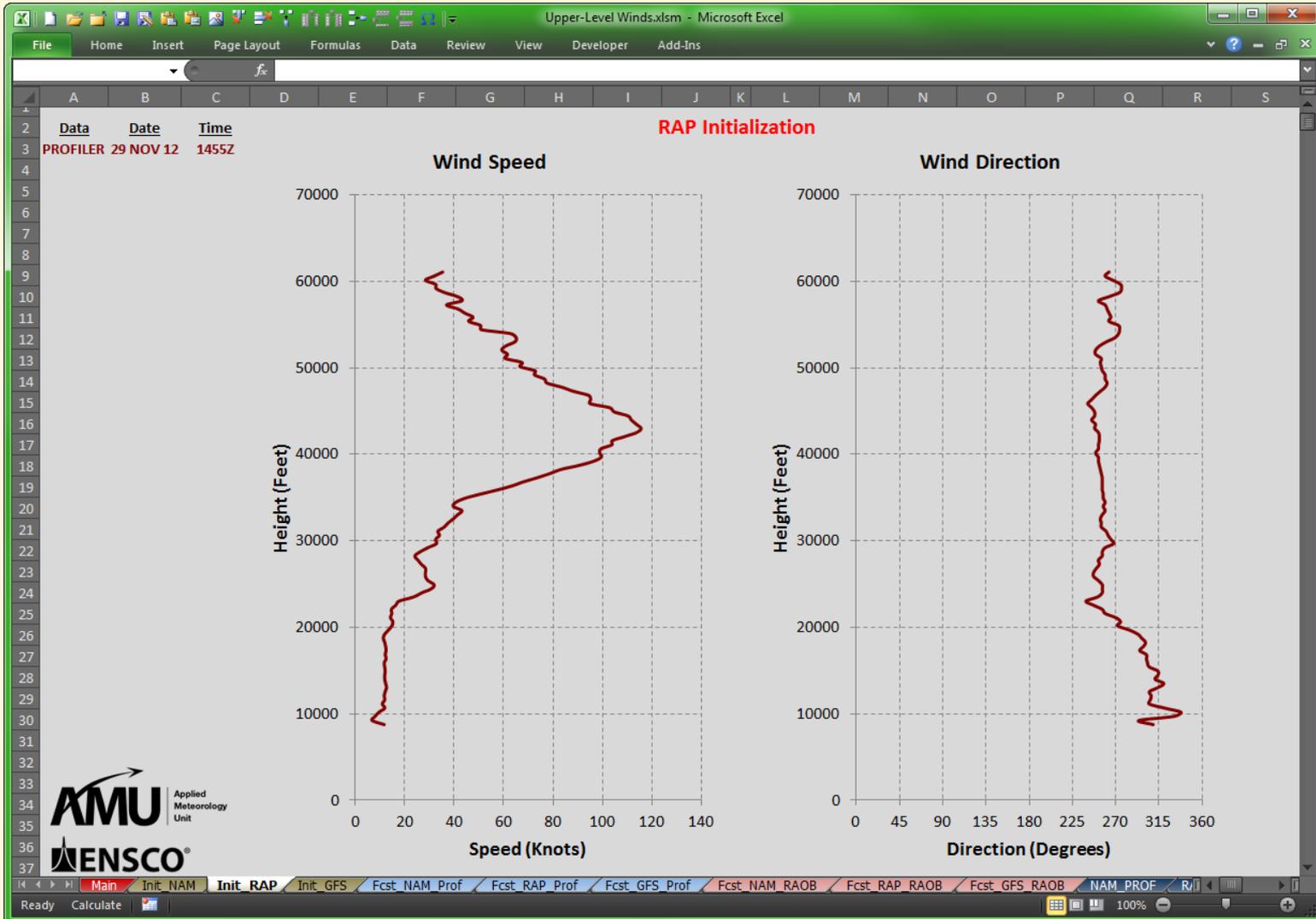
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Model Initialization



Model Initialization

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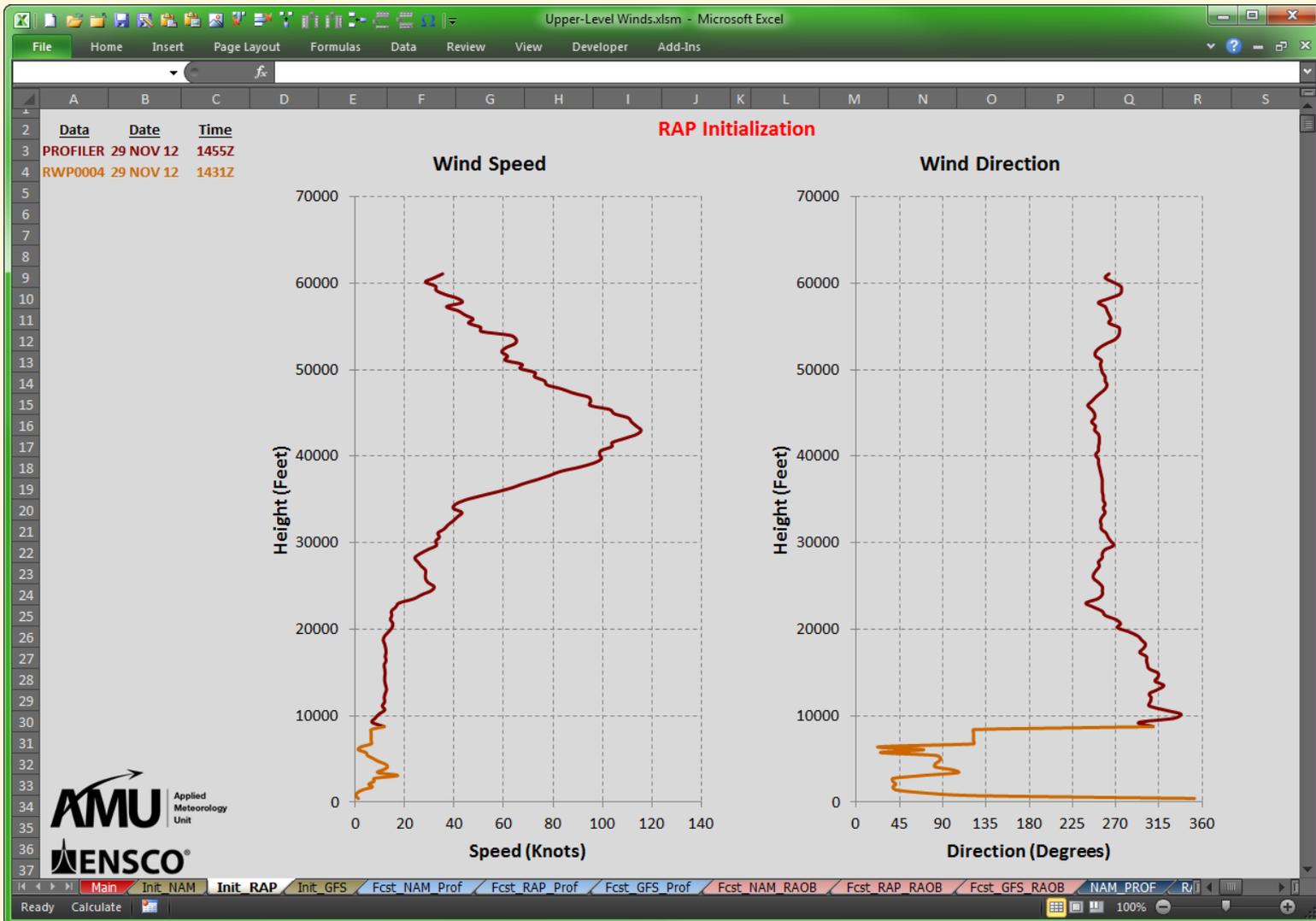
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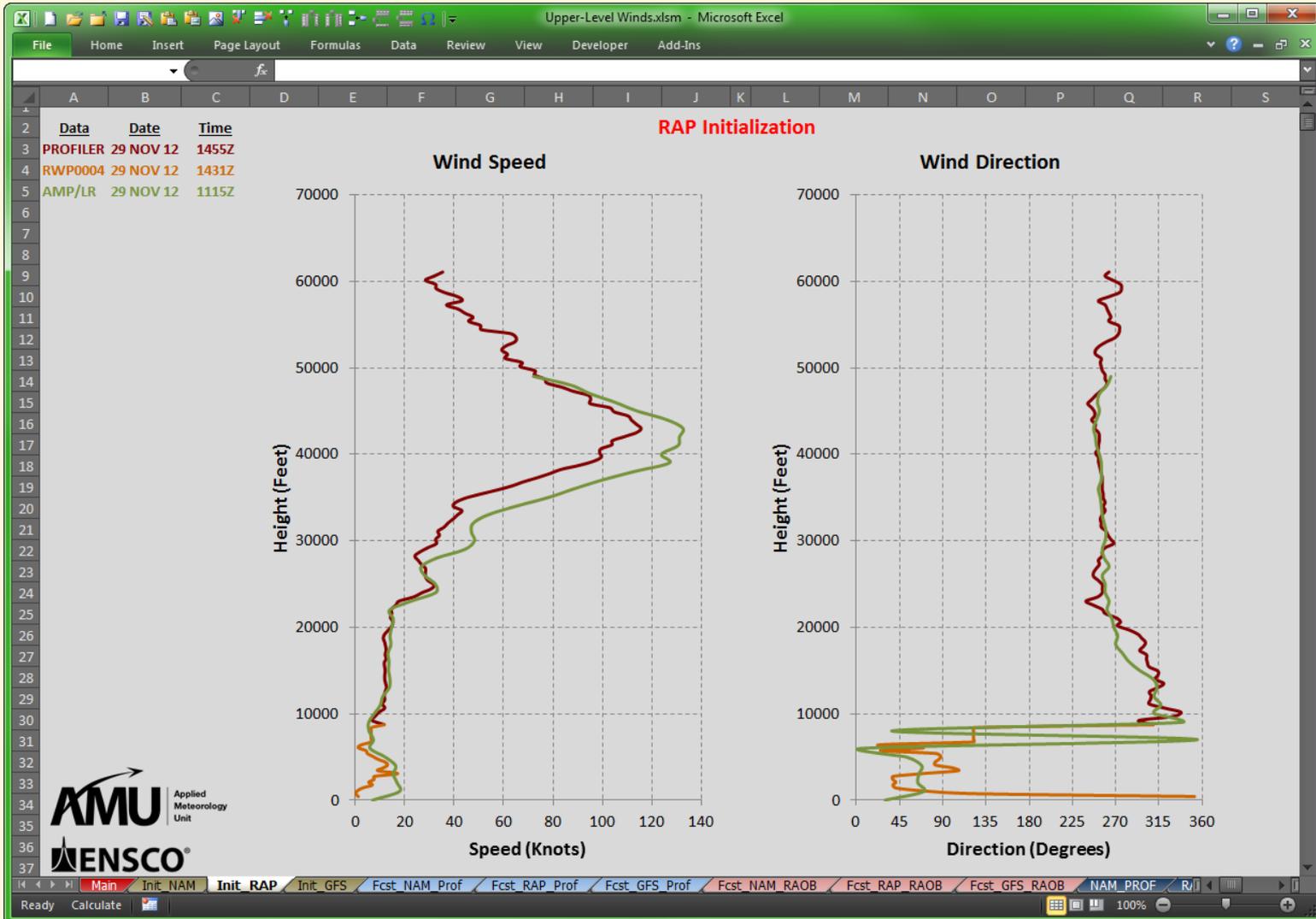
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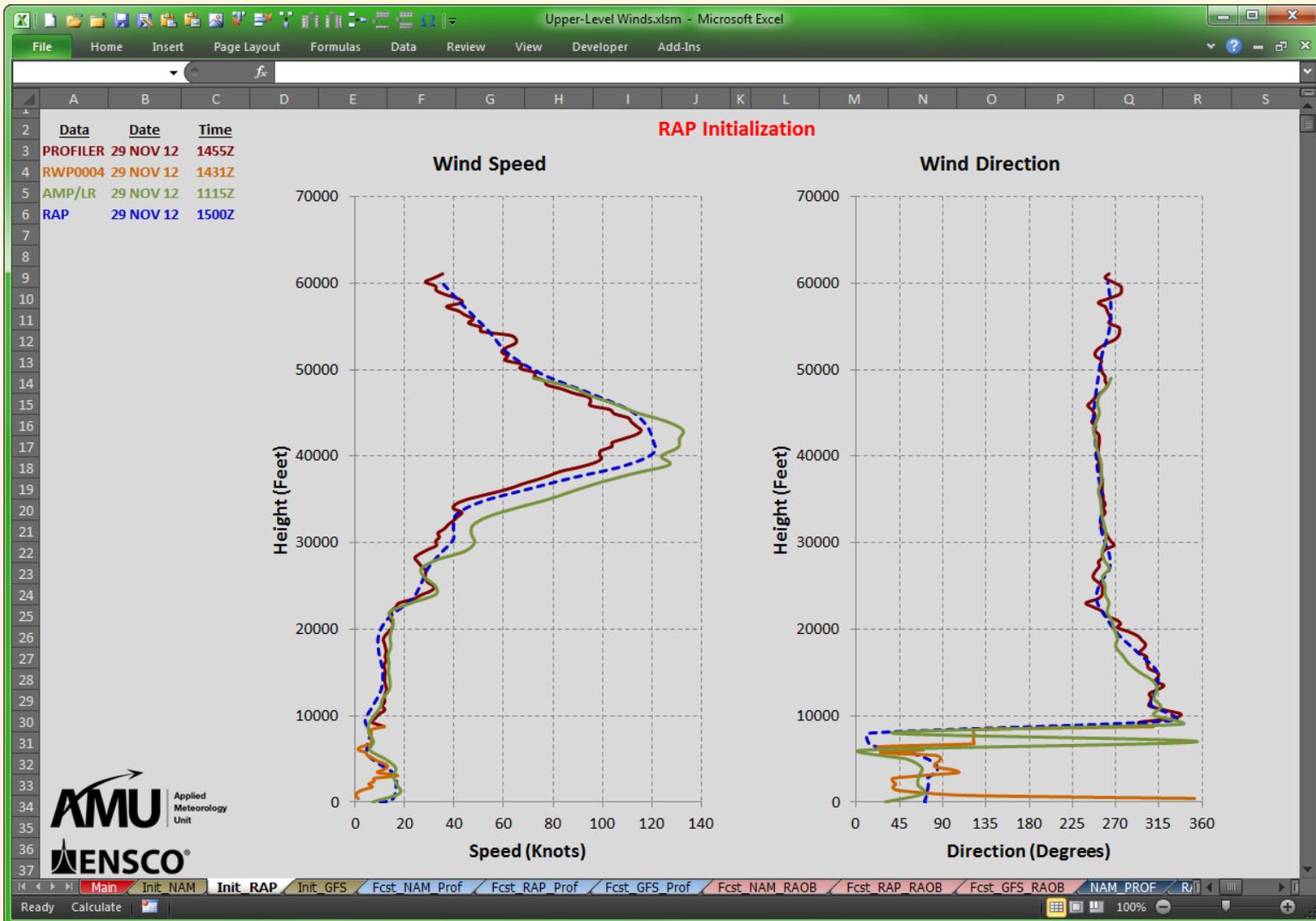
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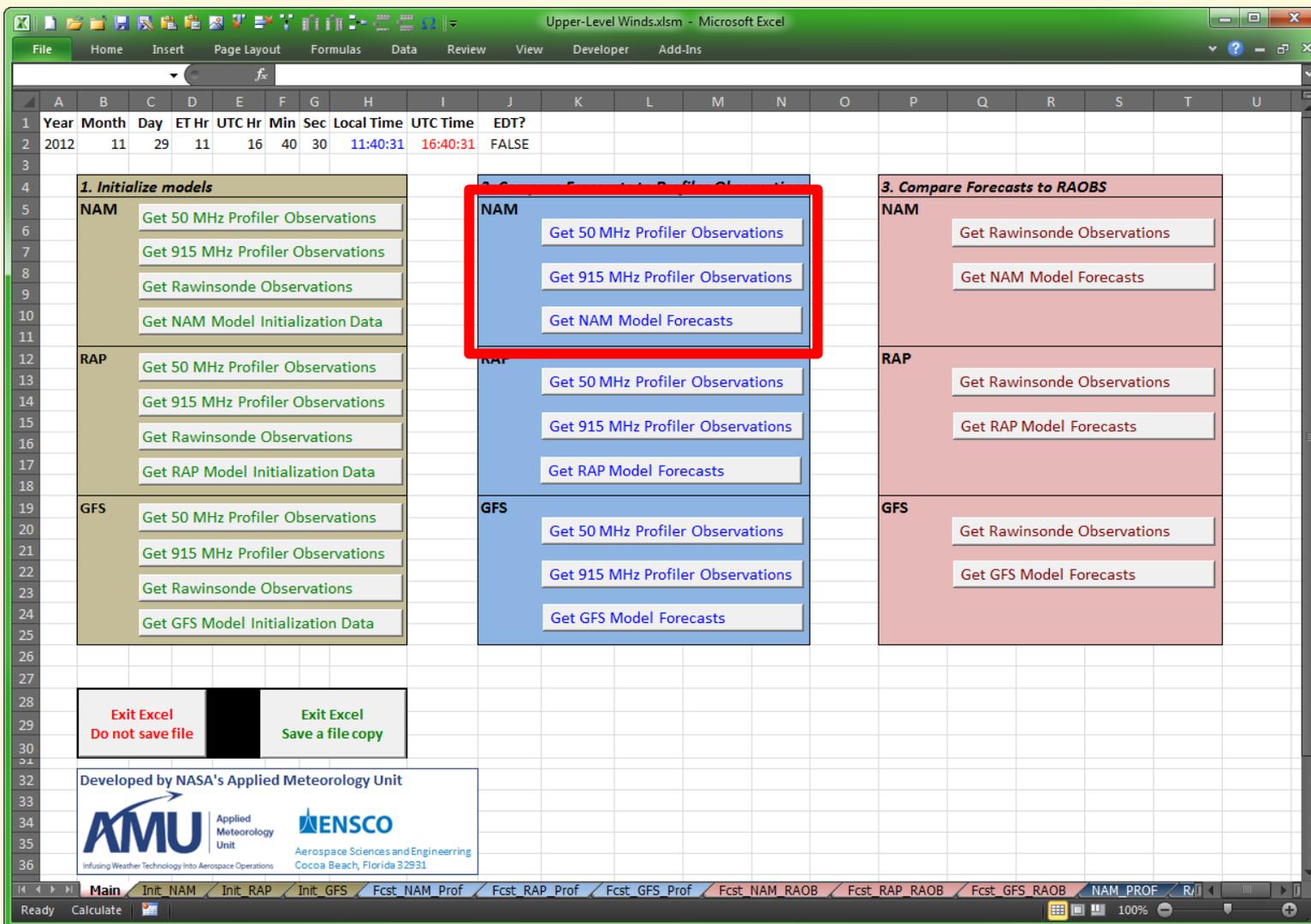

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Model Initialization



Model Forecasts – Profiler



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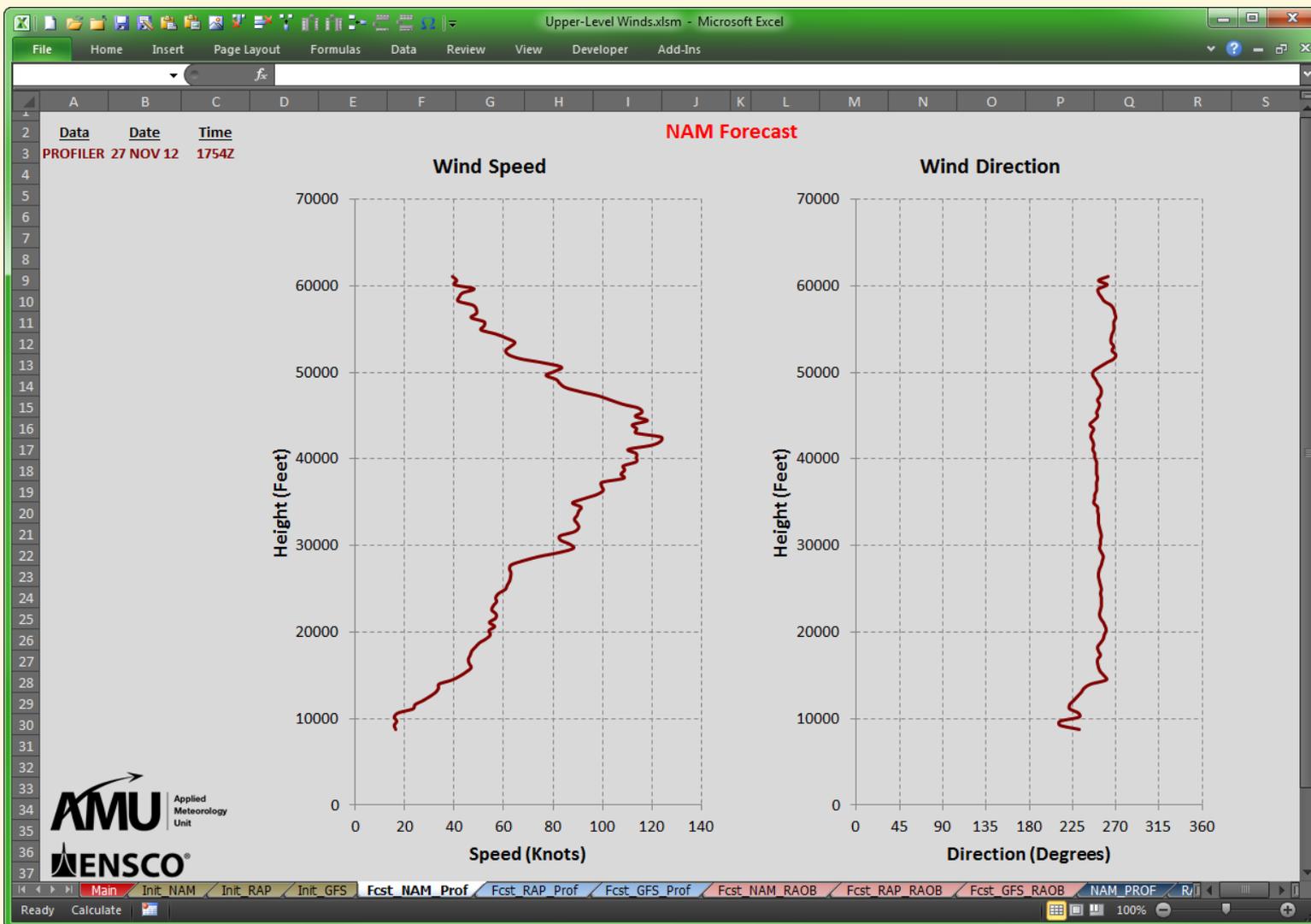
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Model Forecasts – Profiler



Model Forecasts – Profiler

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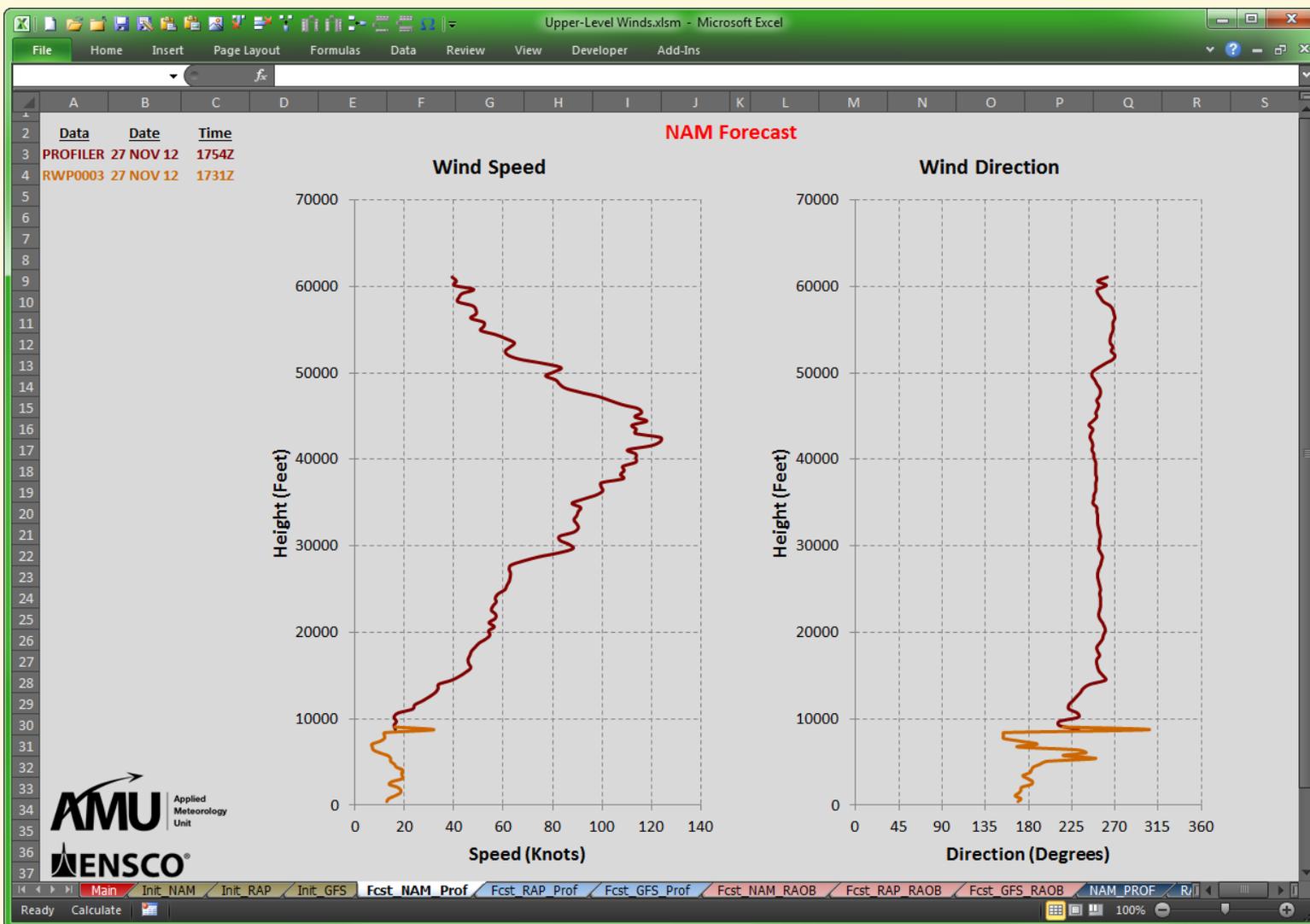
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Model Forecasts – Profiler



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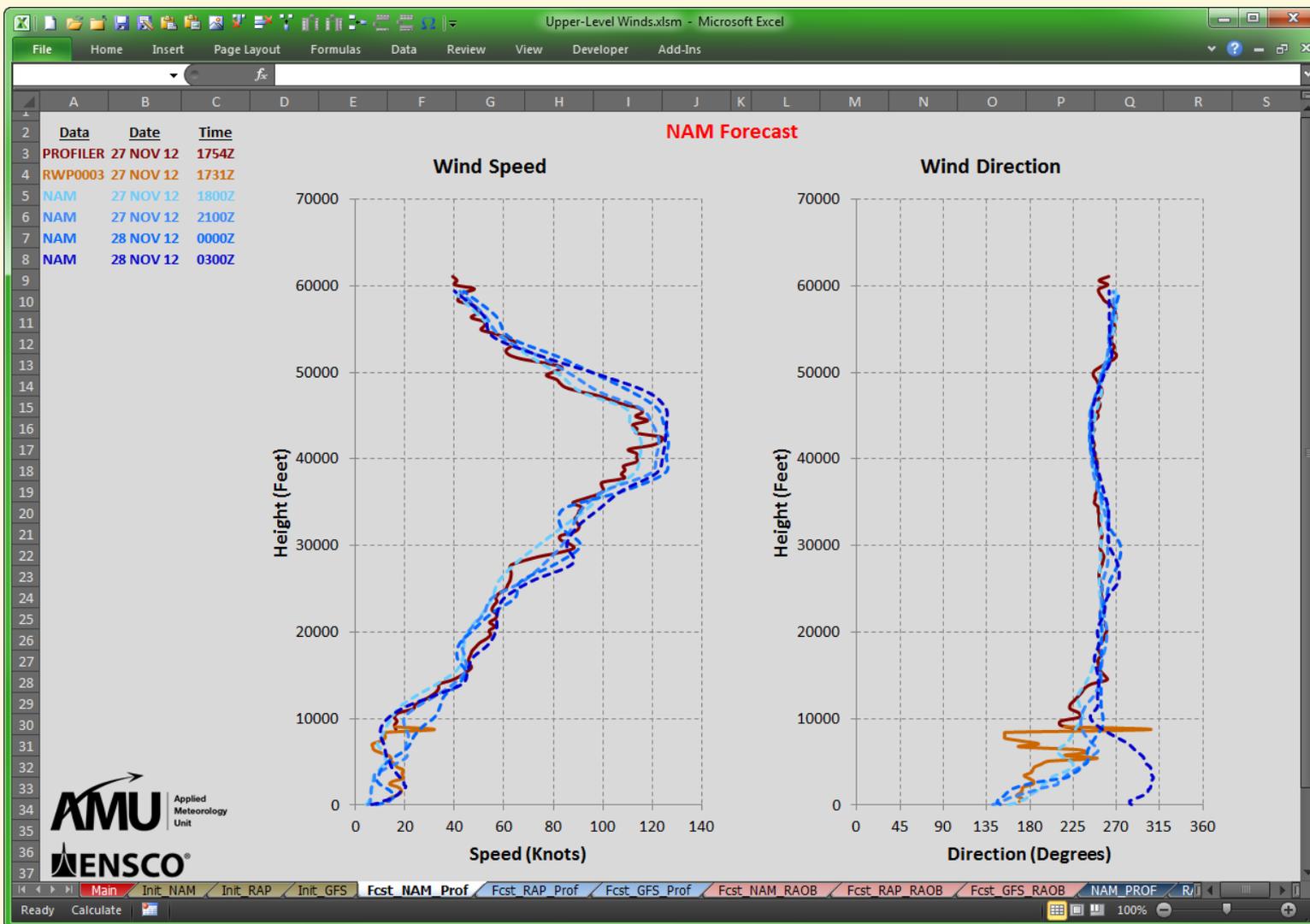
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Model Forecasts – Profiler



Model Forecasts – Rawinsonde

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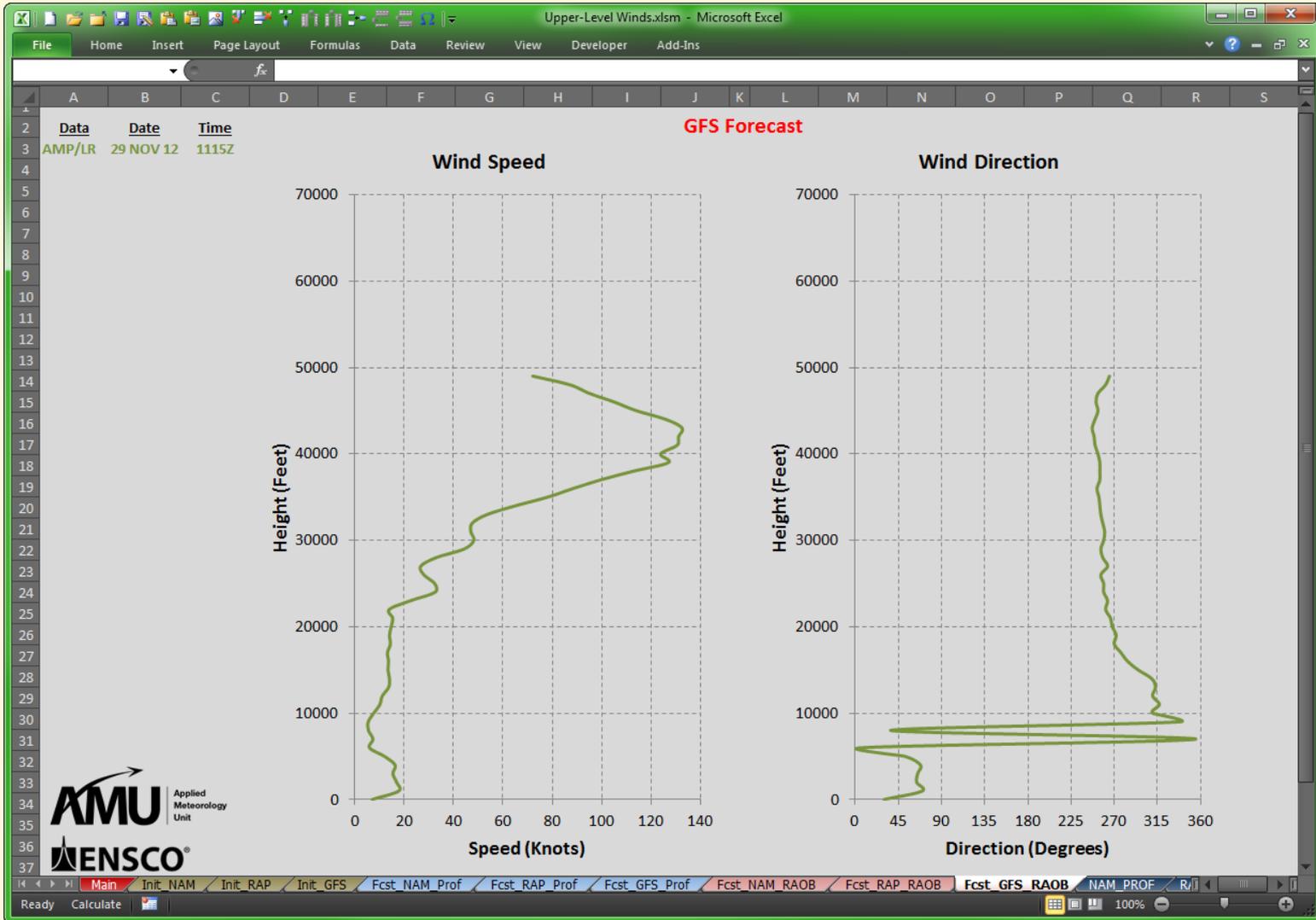



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Model Forecasts – Rawinsonde



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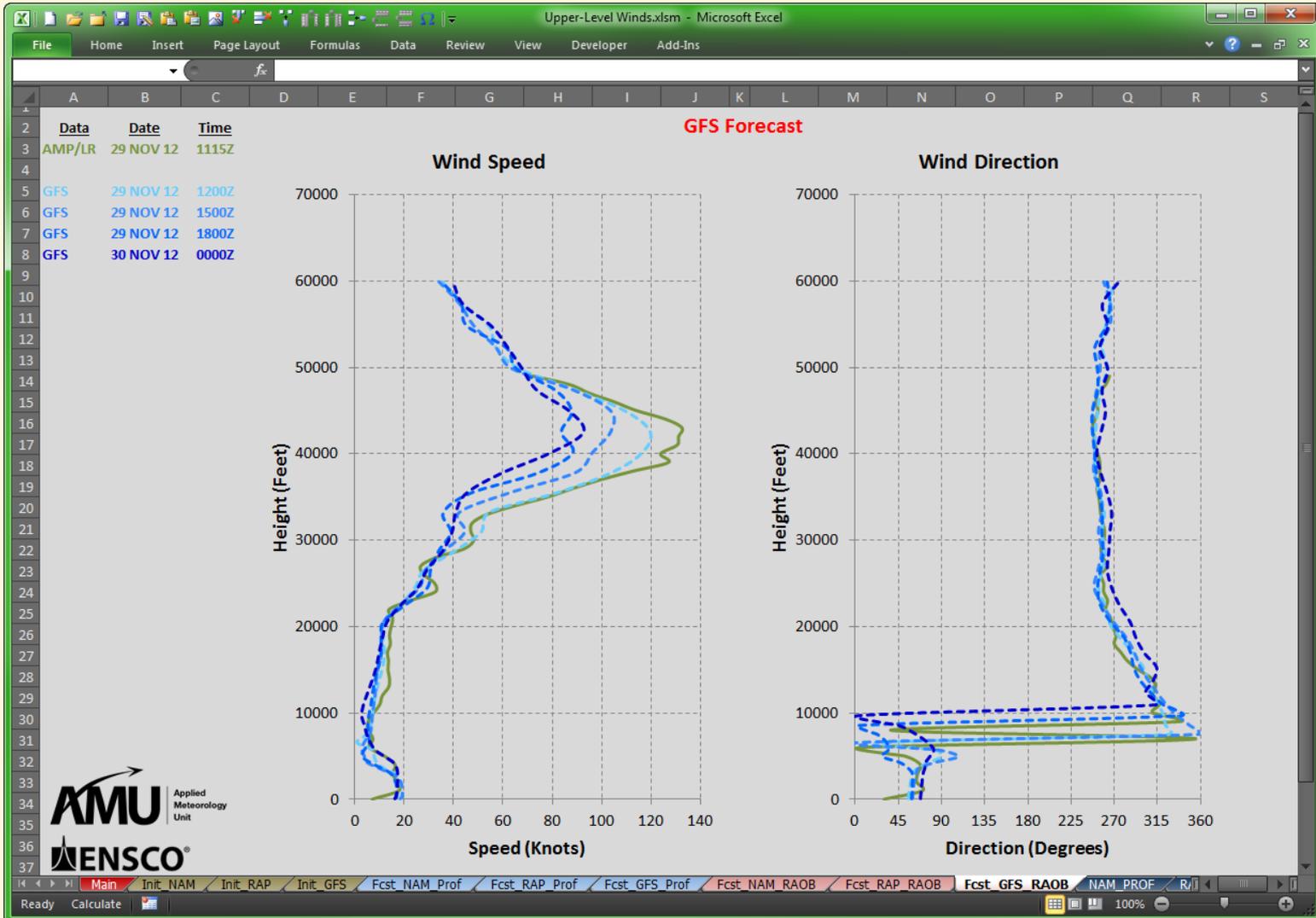

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Ready Calculate 100%



Model Forecasts – Rawinsonde



Conclusions

- Launch directors need to know upper-level wind forecasts
- Developed an Excel-based GUI to display upper-level winds
 - Rawinsonde at CCAFS
 - Wind profilers at KSC
 - Model point data at CCAFS



