

GLM Val Tool Overview

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Introduction

- GLM is an optical instrument
- Closest analog is LIS
- Have several ground-based, 24x7 networks; all are RF sensors
- Comparison between RF & optical characteristics of lightning?

Tool to Validate the GLM System

- Compare with any other available lightning data
- Model after RTMM
- Display multiple data sets
- Calculate, plot & track all statistics
- Show trending
- Flag problems

How to Validate GLM?

- “Game Changer”
- Optical sensor;
ground-based network are RF == different physics
- LIS on TRMM (maybe); LIS on ISS (maybe)
- Range/FOV:
WWLLN has the range, but uniformly low DE ~10%
- DE: NLDN/GLD360 has the range, but mainly sees ground flashes
- DE: LMA has the DE, but is range-limited

Statistics: FDE

- Flash detection efficiency
- Measure against what?
- WWLLN is global, but only about 10% DE
- NLDN sees about 80% of ground, 15% of cloud
- ENTLN? more later...
- LMA best DE, but range-limited
- LMA probably the best candidate for FDE

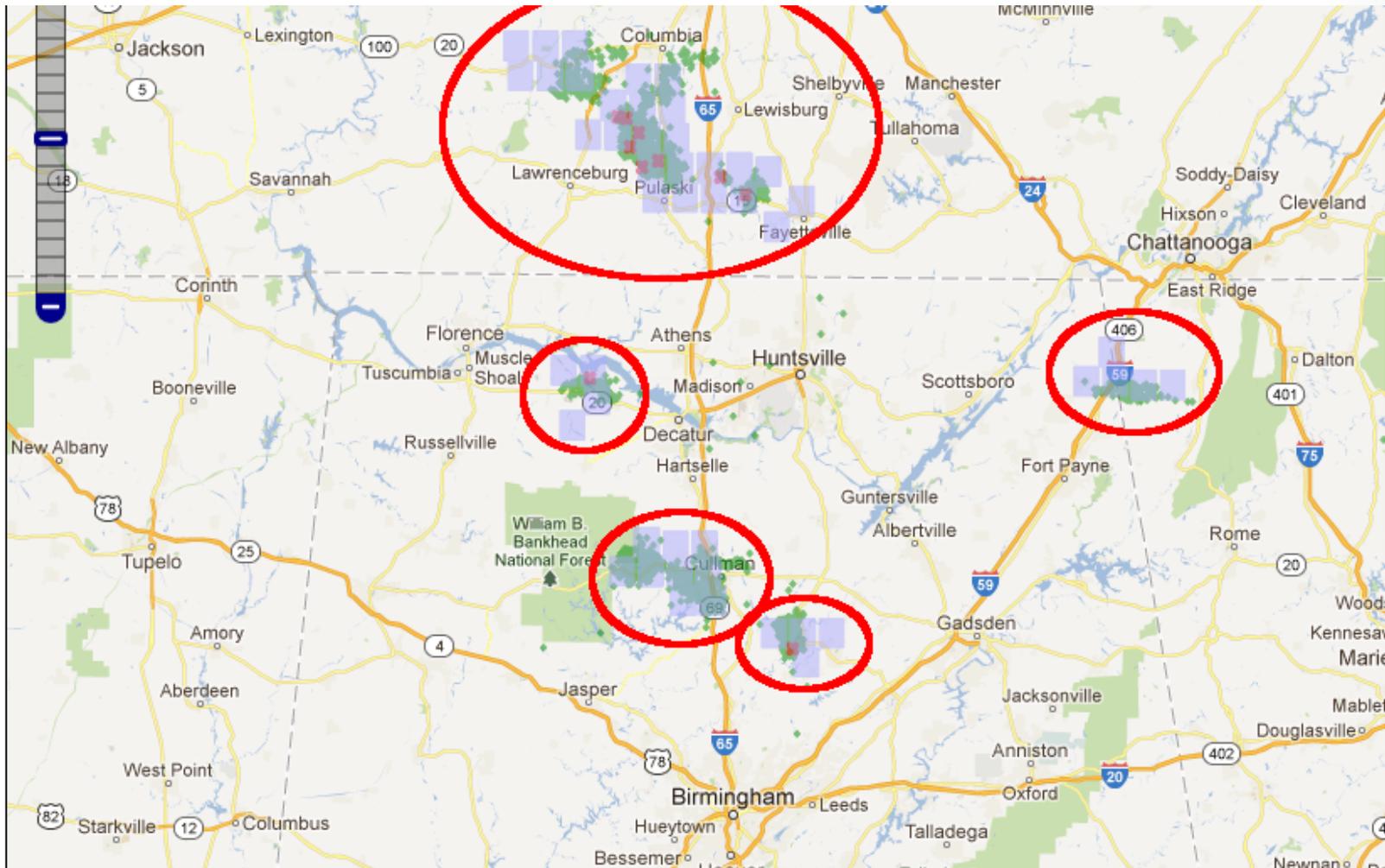
Statistics: FLA

- Flash location accuracy
- Same questions
- GLM pixels are (on average) 9km x 9km
- LMA has accuracy to a few hundred meters
- LMA looks at different physics -- won't agree on what a flash is, let alone where it is
- NLDN (GLD360?) probably the best candidate for FLA

Statistics: FTA

- Flash time accuracy
- GLM integrates 2ms frames
- LMA has timing accuracy to 100 ns, but again, different physics
- LMA may work, but NLDN probably the best candidate for FTA

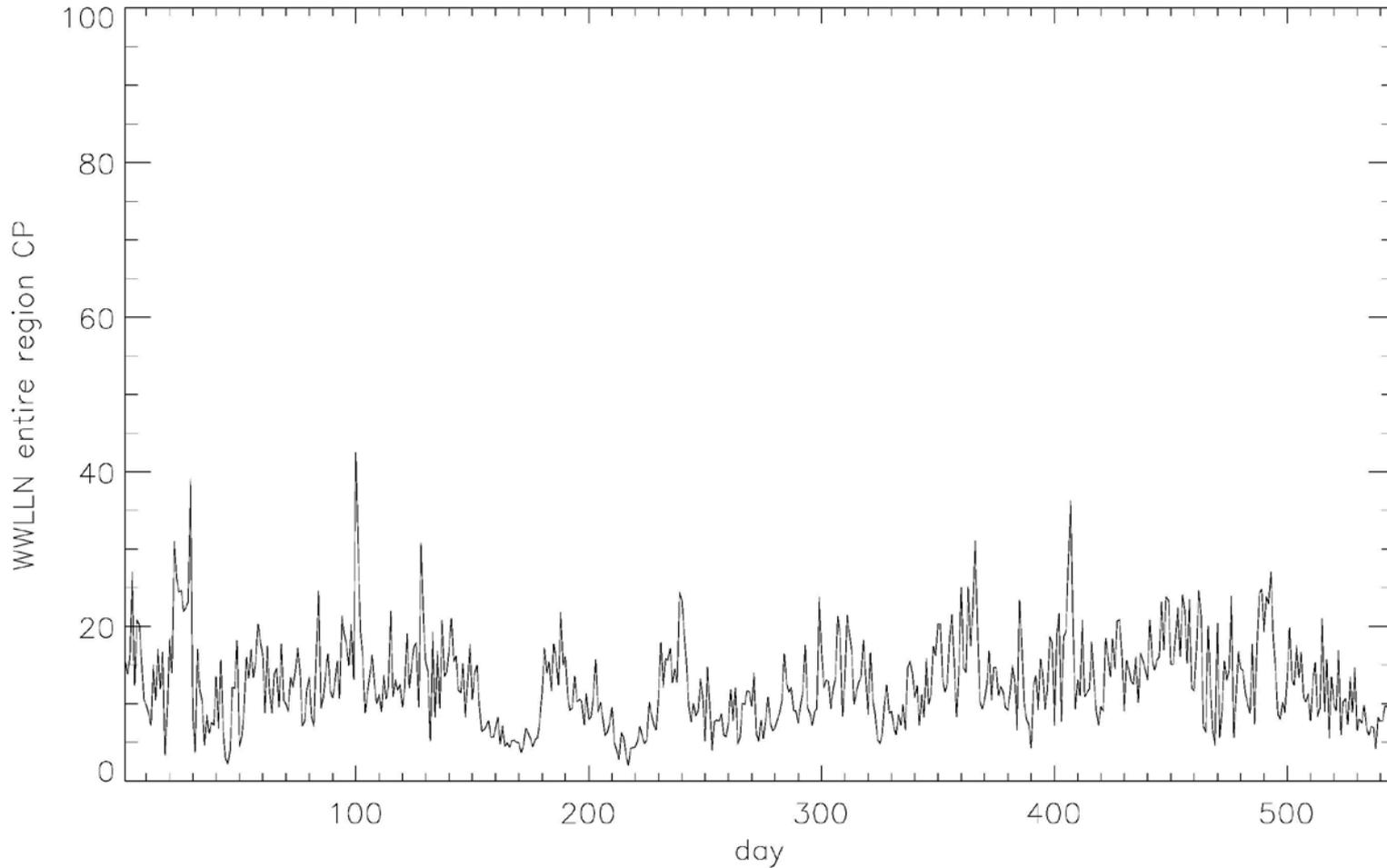
Val Tool Map



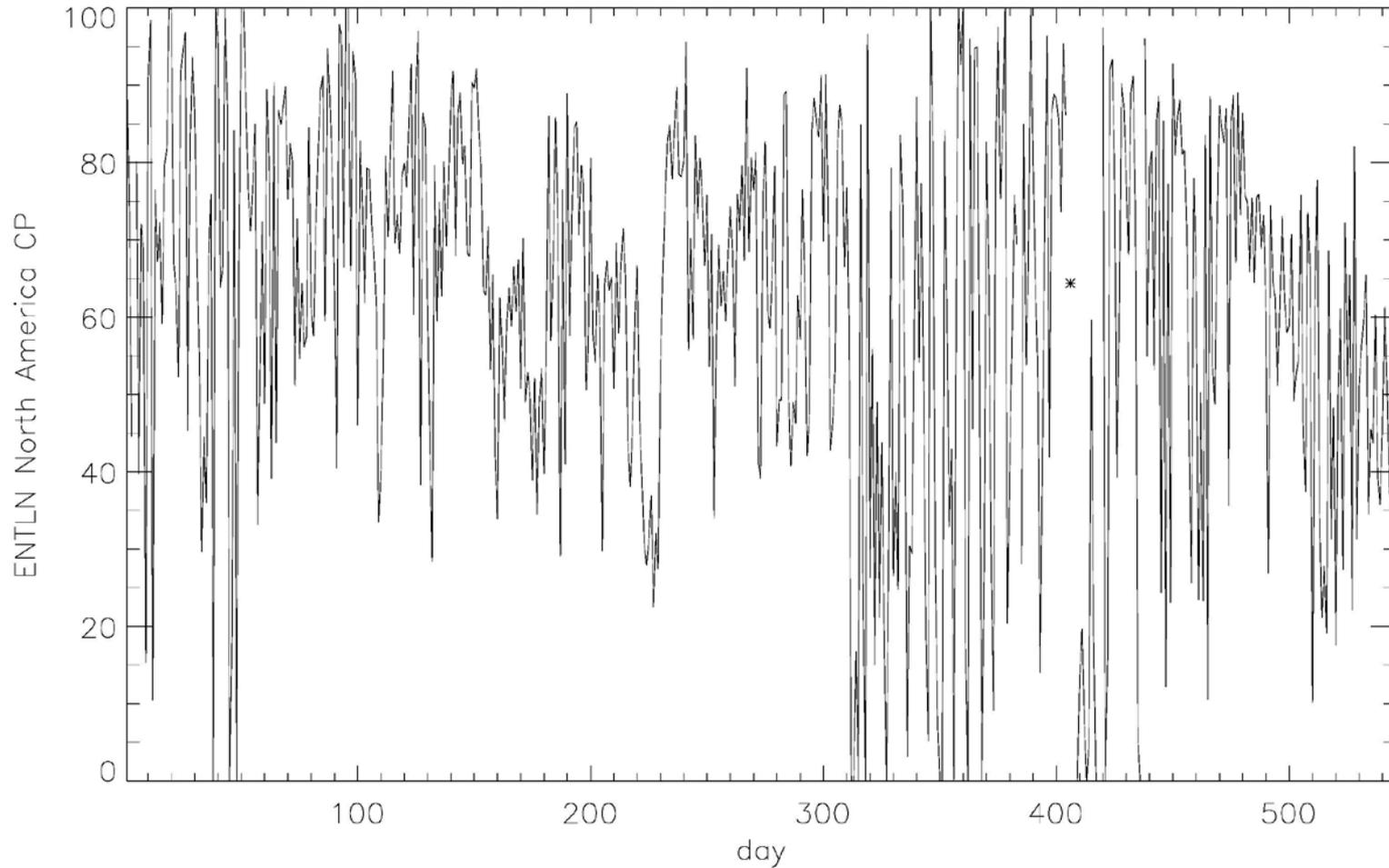
Comparison Study: WWLLN & ENTLN

- Needed to fully characterize other networks
- Compared with LIS, the best analog for GLM
- Groups to strokes
- Comparison methodology -- time/space window selection
- Groups to strokes -- ended up being flash comparisons

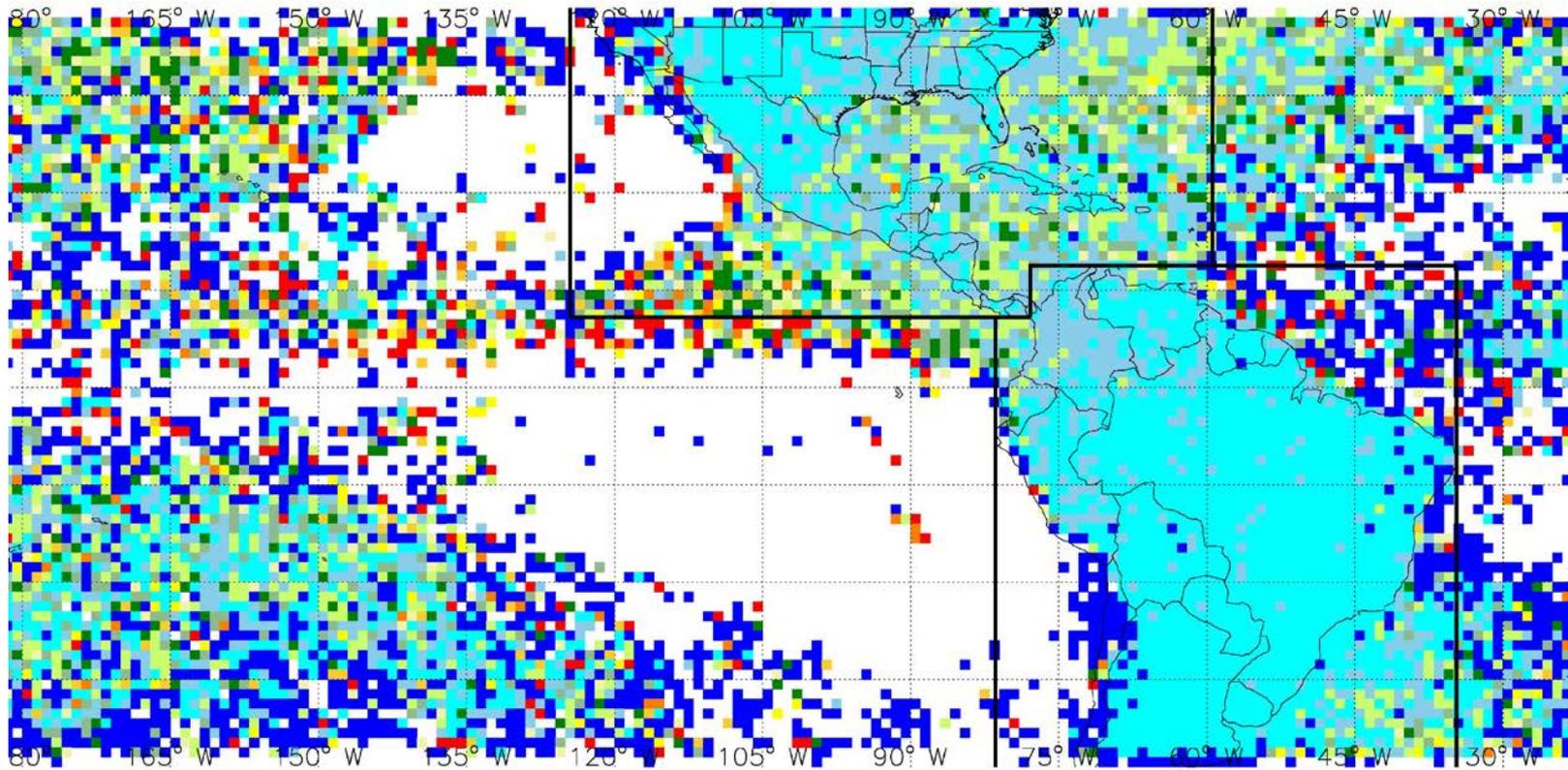
WWLLN Timeline Plot



ENTLN Timeline Plot



WWLLN Map



ENTLN Map

