Vaisala Total Lightning Network Update

/ Nikki Hembury
/ Southern Thunder Conference 2011

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Vaisala Total Lightning Networks

1. **Dallas Fort Worth (DFW), TX**
   - 9 x LDAR II Sensors
   - Installed and operational from 2001-2010

2. **Tucson, AZ**
   - 4 x LS8000 sensors
   - Installed and operational from 2007-2010

3. **Paris, France**
   - 4 x LS8000 sensors
   - Installed and operational from 2009-current
   - Connecting to RMI Belgium SAFIR network for expanded coverage

4. **National Lightning Detection Network®, NLDN®**
   - 12 x TLS200 sensors (as initial deployment)
   - Installed and operational from Q4 2011

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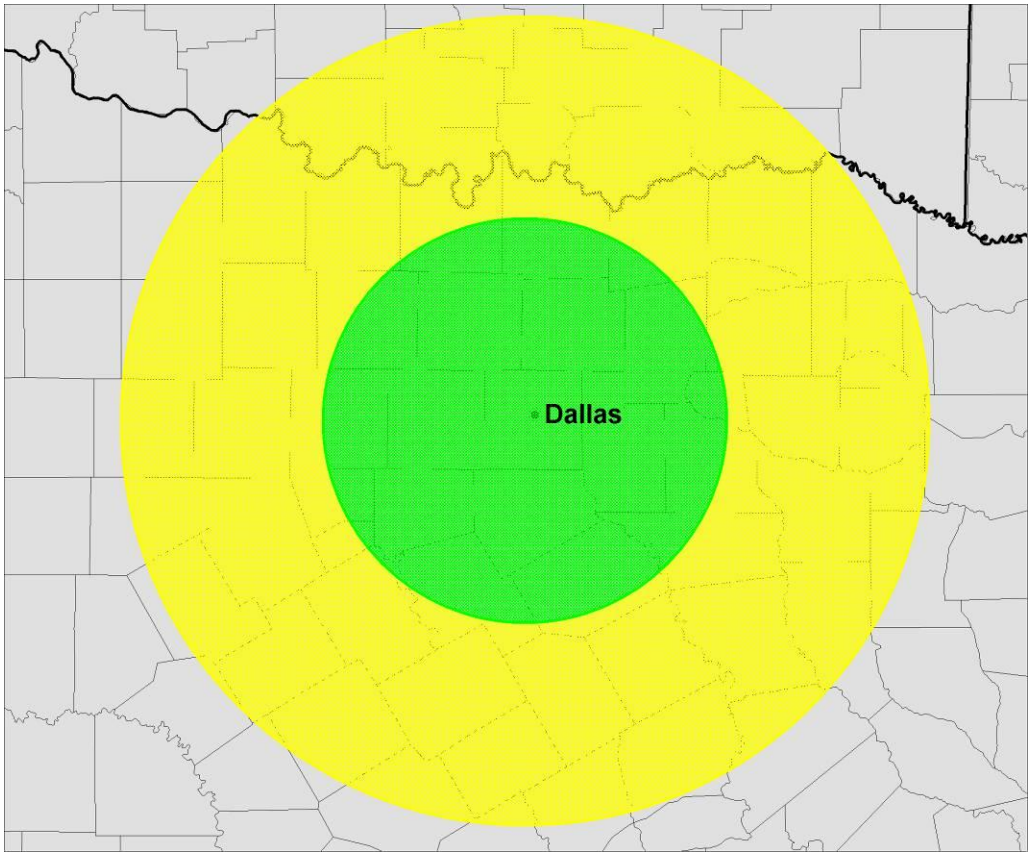
VHF total (cloud plus CG) lightning mapping networks

Vaisala's Dallas-Fort Worth (DFW) Demonstration Network



- **High Performance (Green) Region:**
  - **100 km Radius**
- **Cloud to Ground:**
  - **DE >90%**
  - **LA 500 meters**
- **Cloud to Cloud:**
  - **DE >90%**
  - **LA <1 km**
- **Lower Performance (Yellow) Region:**
  - **200 km Radius**

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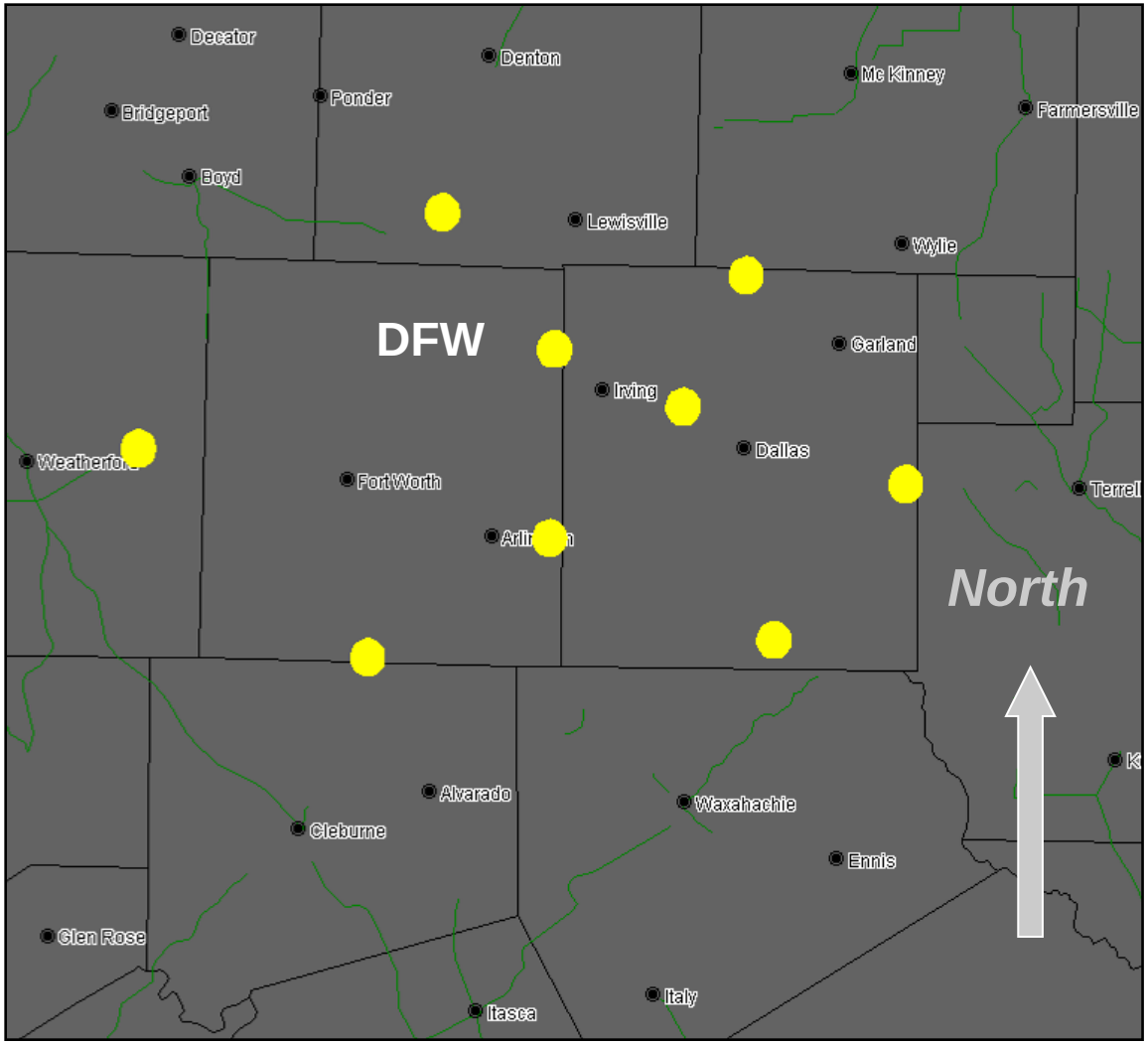

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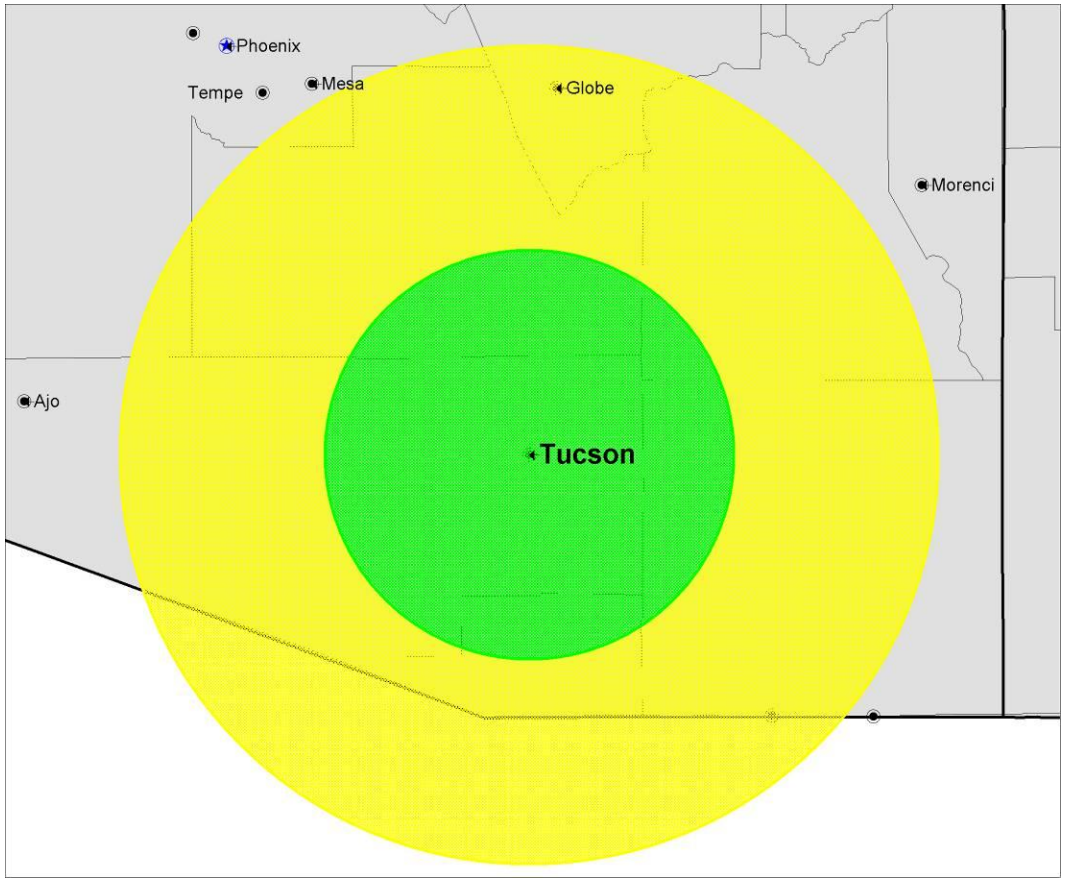
VHF total (cloud plus CG) lightning mapping networks

Vaisala's Tucson Demonstration Network



- **High Performance (Green) Region:**
  - **75 km Radius**
- **Cloud to Ground:**
  - **DE >90%**
  - **LA 250 meters**
- **Cloud to Cloud:**
  - **DE >90%**
  - **LA 1-2 km**
- **Lower Performance (Yellow) Region:**
  - **150 km Radius**

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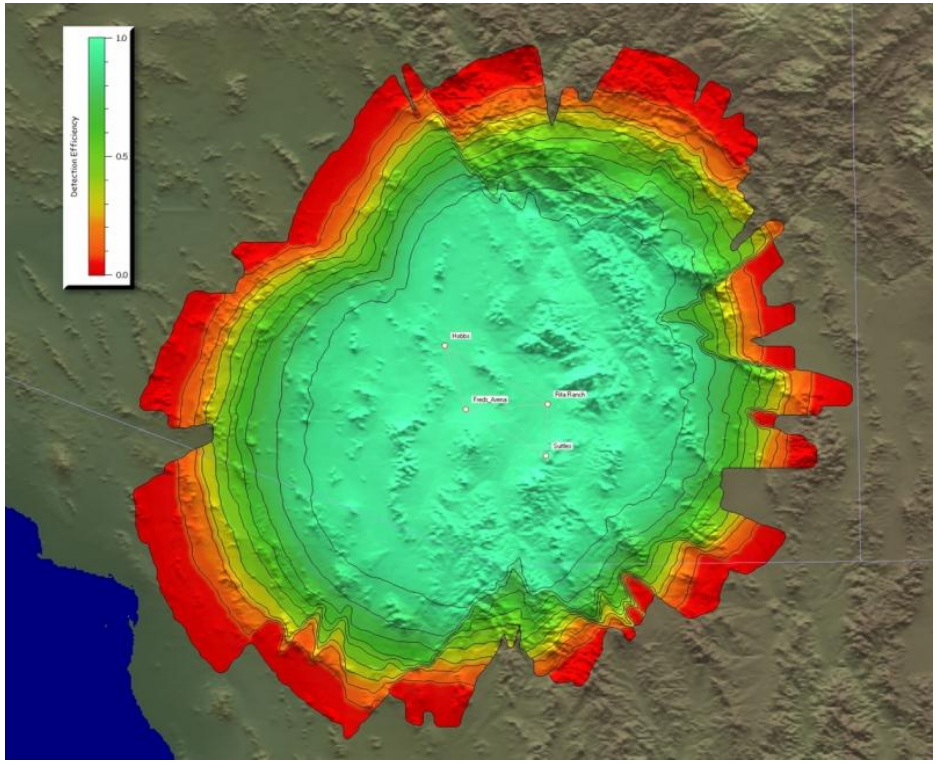
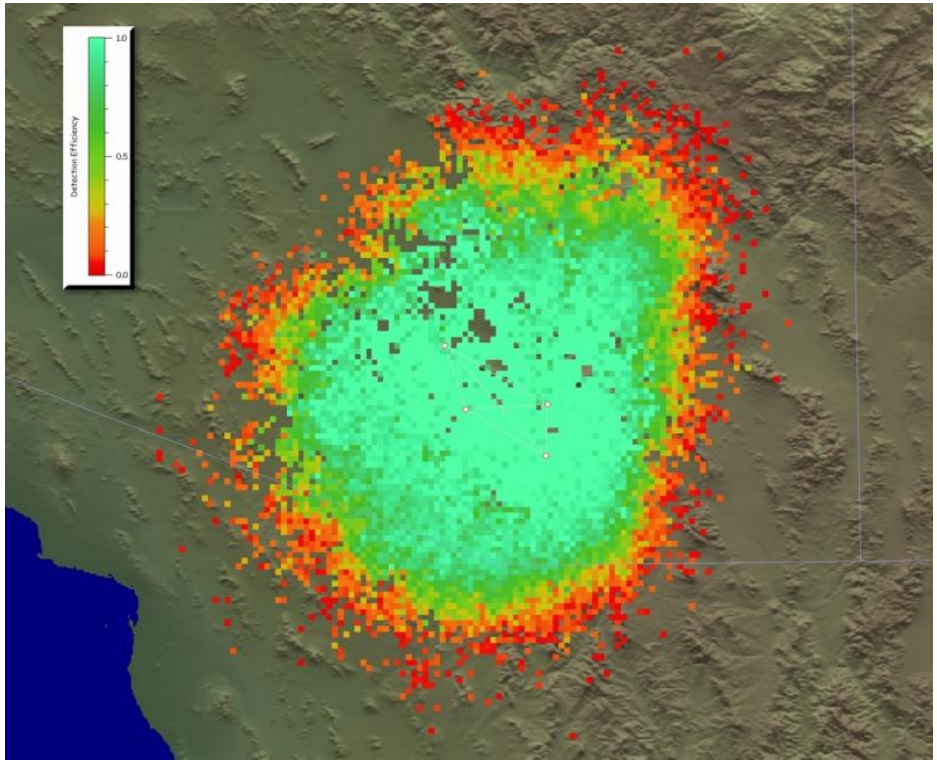
Vaisala's Tucson Demonstration Network

Total lightning detection efficiency at 6 km altitude



Validated detection efficiency relative to NLDN CG lightning data



Criteria – VHF source within 30 km and 300 ms of first return stroke from CG lightning flash

Lojou et al. (2008)

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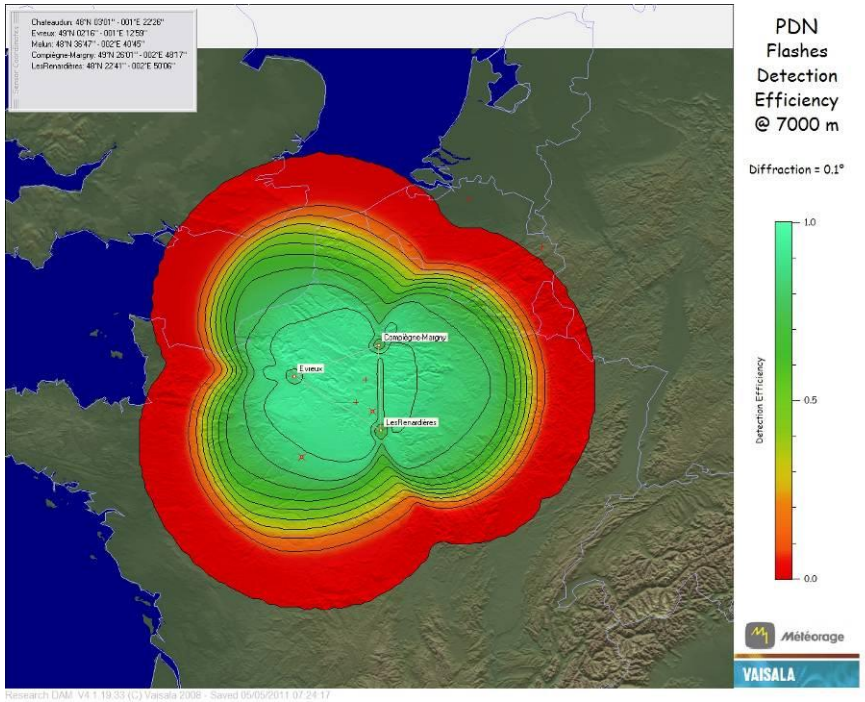
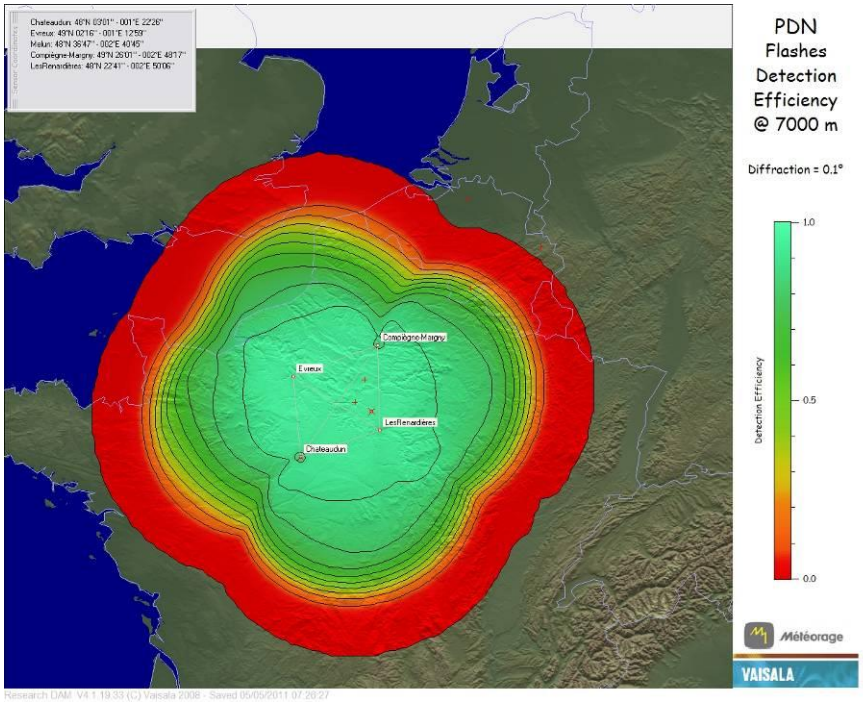
VHF total (cloud plus CG) lightning mapping networks

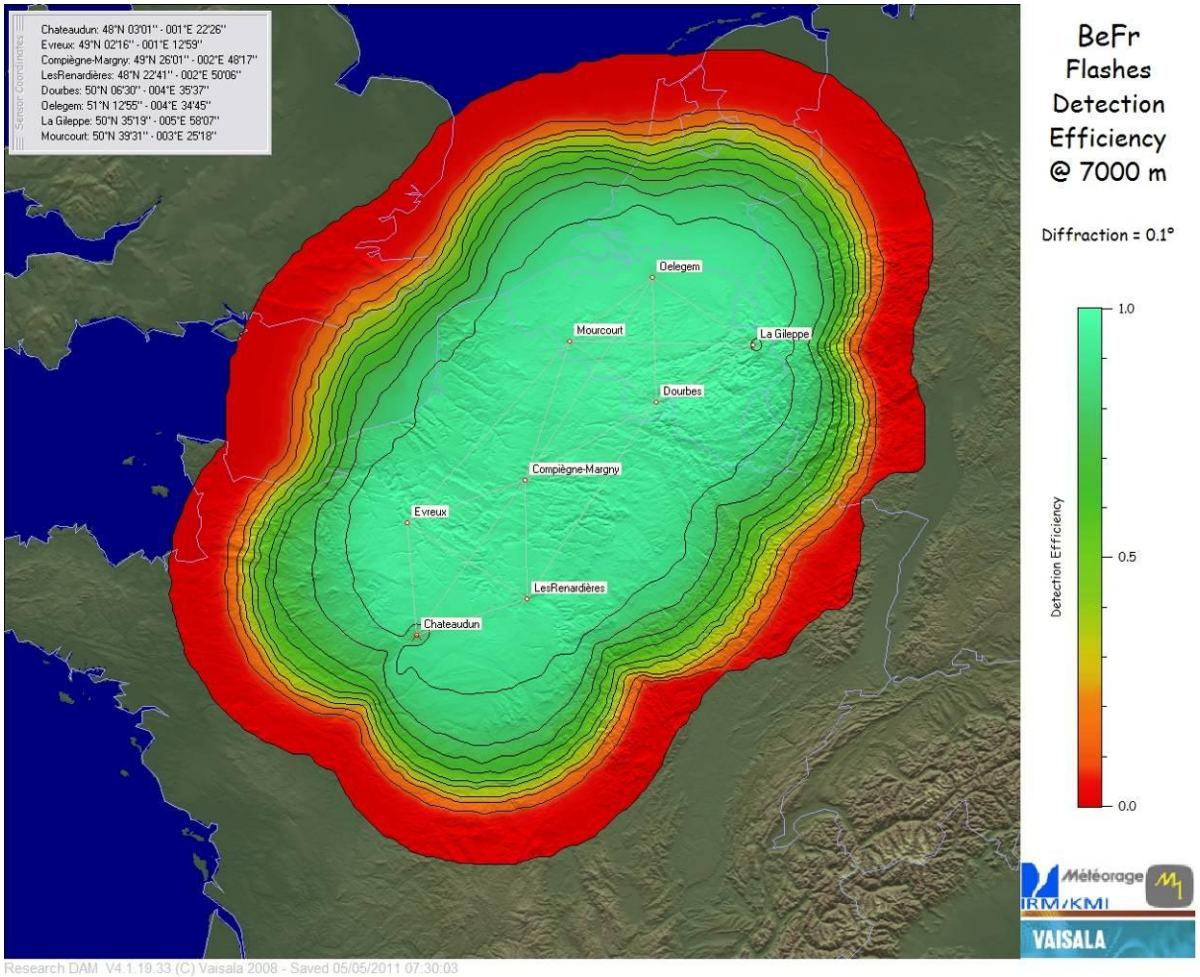
Vaisala's Paris (France) Demonstration Network





VHF total (cloud plus CG) lightning mapping networks

Vaisala's Paris (France) Demonstration Network



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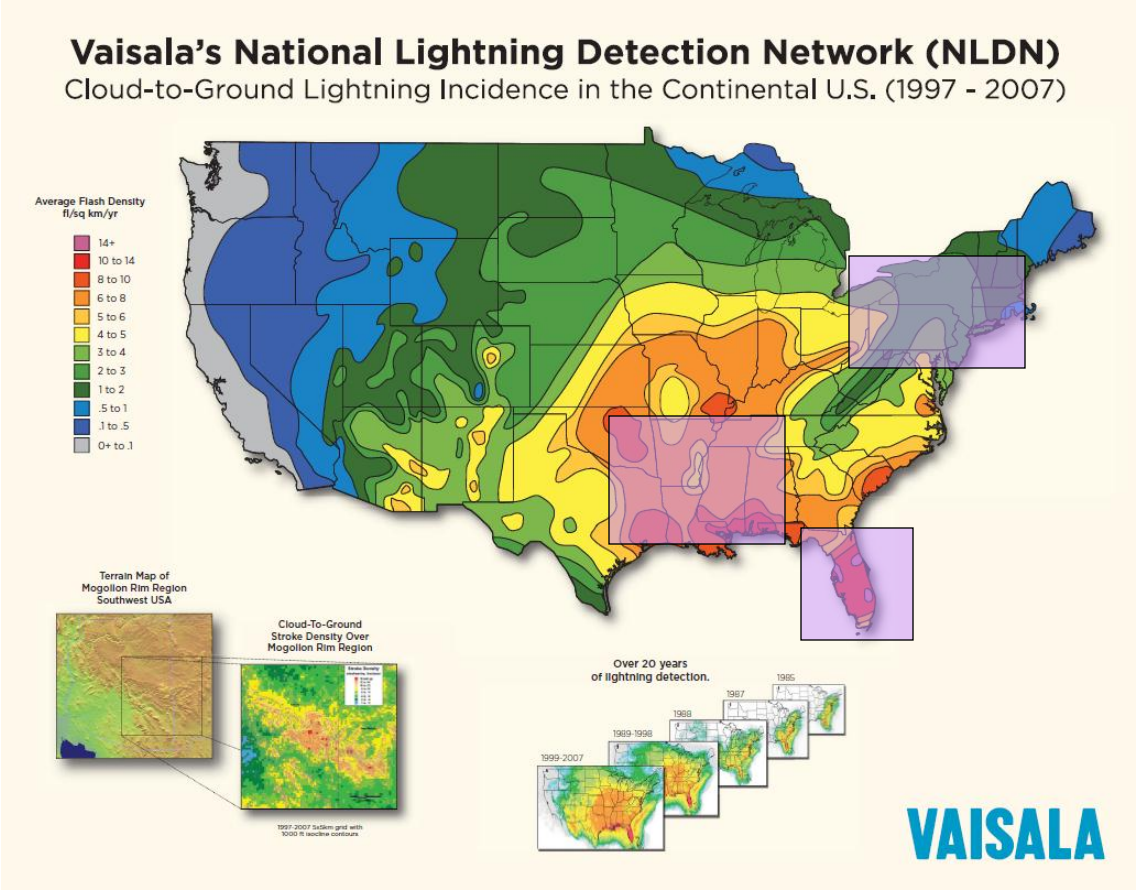
NLDN® Total Lightning expansion



- NLDN® expansion to TLS200 product
- The best detection capability
- Properly grouping cloud pulses without exaggerating DE claims
- Validation through third party studies and ground truth/high speed video campaigns

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2012 ILDC/ILMC

- 22nd International Lightning Detection Conference
- 5th International Lightning Meteorology Conference
- April 2-5, 2012
- Renaissance Boulder Flatiron Hotel, Broomfield, Colorado
- Theme: The value of lightning information for safety and asset protection

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