



A refined, objective approach for characterizing ICI event conditions and application to Appendix D data collection

***** Progress Update**

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Technique overview

- **Systematically & objectively analyze Boeing events database, analyze Flight Campaign environments**
- We've identified 3 types of analyses to include in the core logic. They are automated/objective procedures for
 1. **Extracting and compiling fundamental environmental parameter statistics**
 2. **Tracking evolution of large scale (mesoscale in this case) convective features**
 3. **Tracking embedded local storm features both spatially and temporally relative to ICI events (e.g. convective overshoots)**

Fundamental Parameters

Routines will automatically extract the following fundamental parameters:

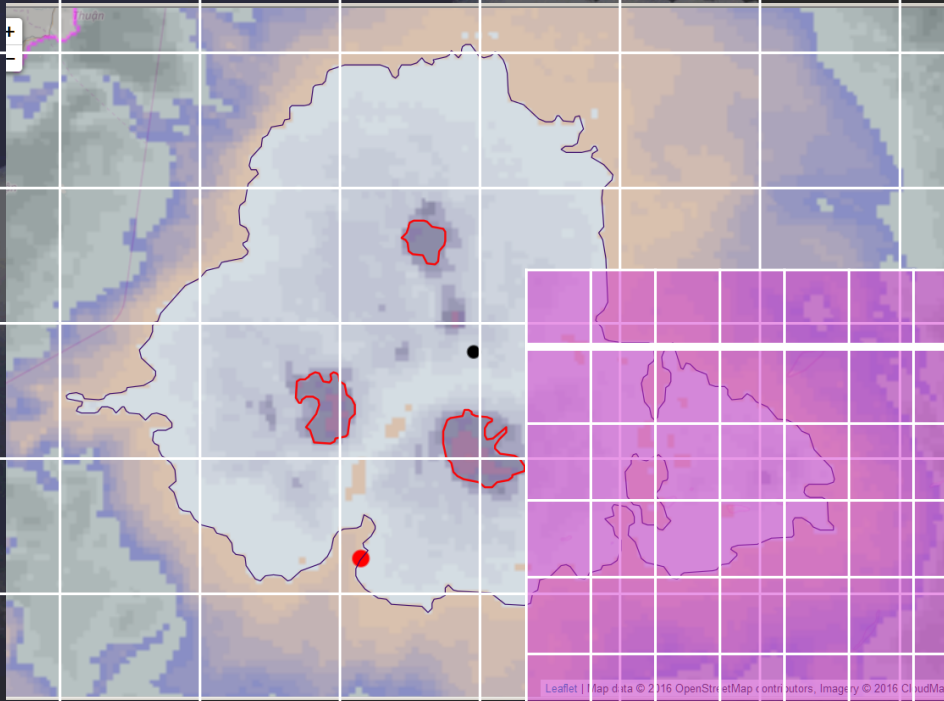
- Precipitable water (PW)
- CAPE
- Equilibrium Level Temperature (T_{EL})
- Cold point tropopause (CPT)
- Minimum cloud top temperature (CTT_{min})
- Storm relative anvil level wind shear
- Low level inflow winds
- Enhanced distance of aircraft track across $T \leq T_{EL}$
- Area-equivalent diameters of enhanced cloud (D_{eq}).

To be completed by end of 2016

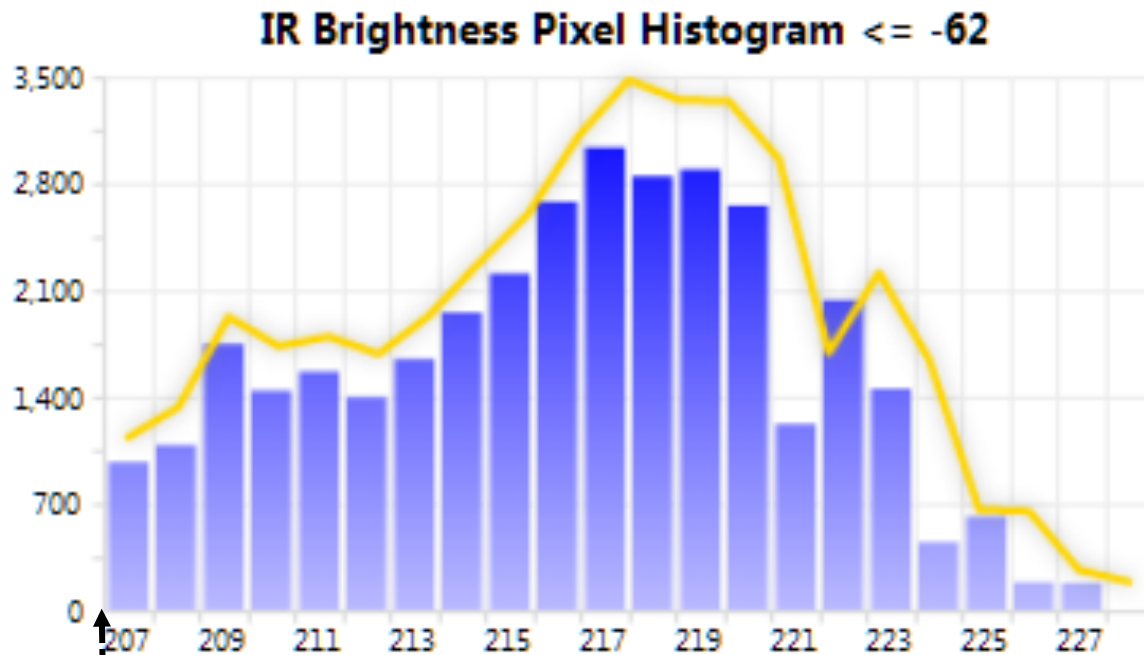
- **(Currently 184 events in database)**
- **Download all available IR data (2 hr window) for each event**
 - Remap to rect
 - Apply time offsets
 - Apply parallax offsets
- **MCS polygon, OT/ELO polygons (overshooting tops, EL overshoots)**
- **Calculate fundamental parameters (GFS)**
 - Find MCS inflow quadrant from storm motion & LL wind vectors grid
 - Produce Inflow soundings grid (to arrive at representative inflow sounding)
 - ? adjust inflow sounding with IR detected ELT ?
- **Spatial calculations OT/ELO distance from event location**

Finding a Representative Sounding

- Use GFS trop T (80%) as first guess for MCS polygon
- Centroid
- LL winds
- Sounding grid (purple)

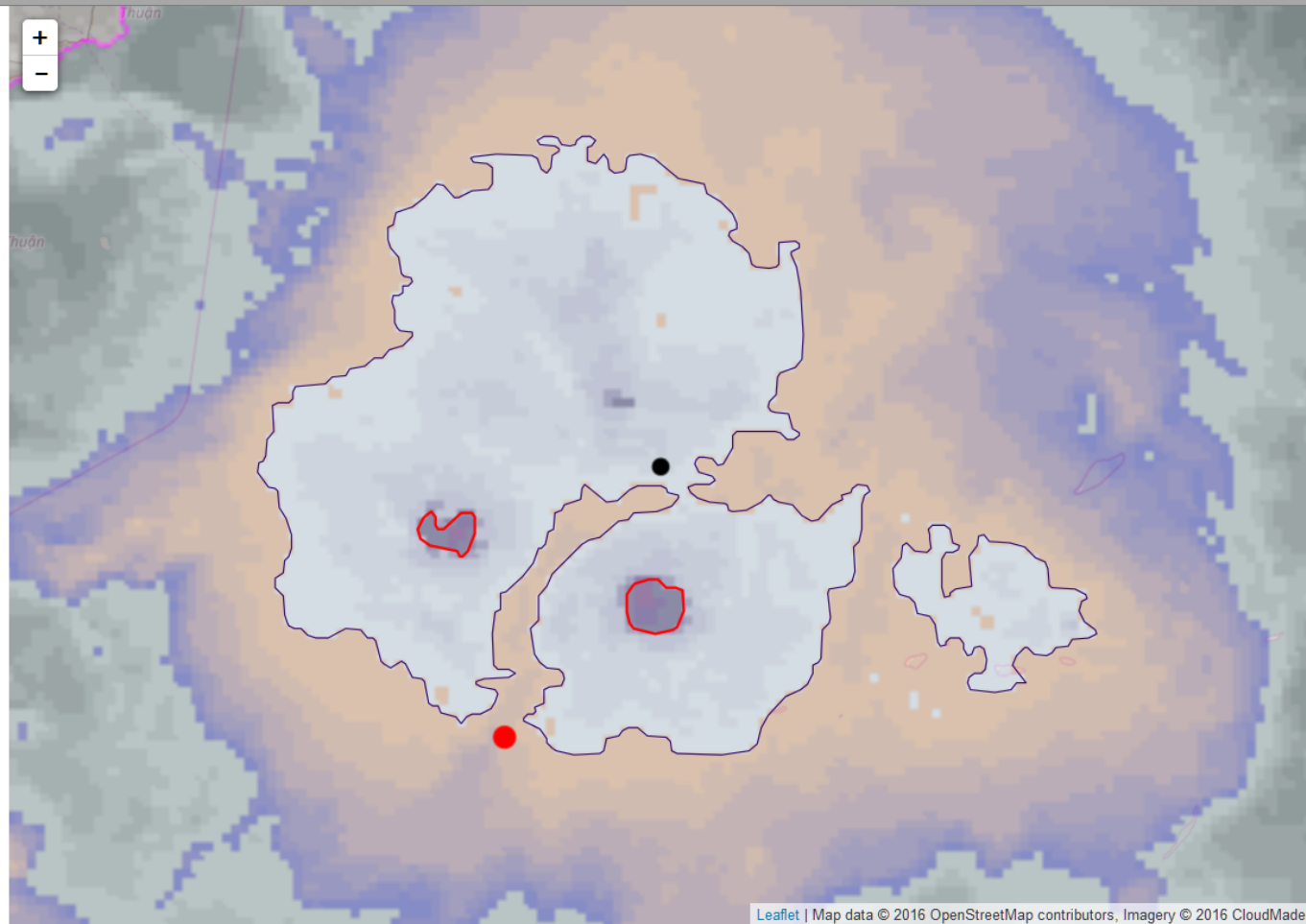


IR detected ELT

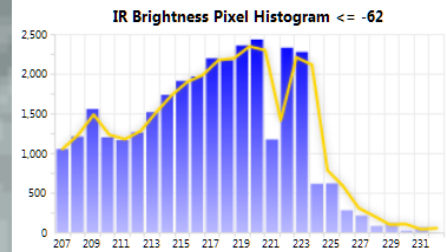


80% of GFS tropopause temperature

IR detected ELT



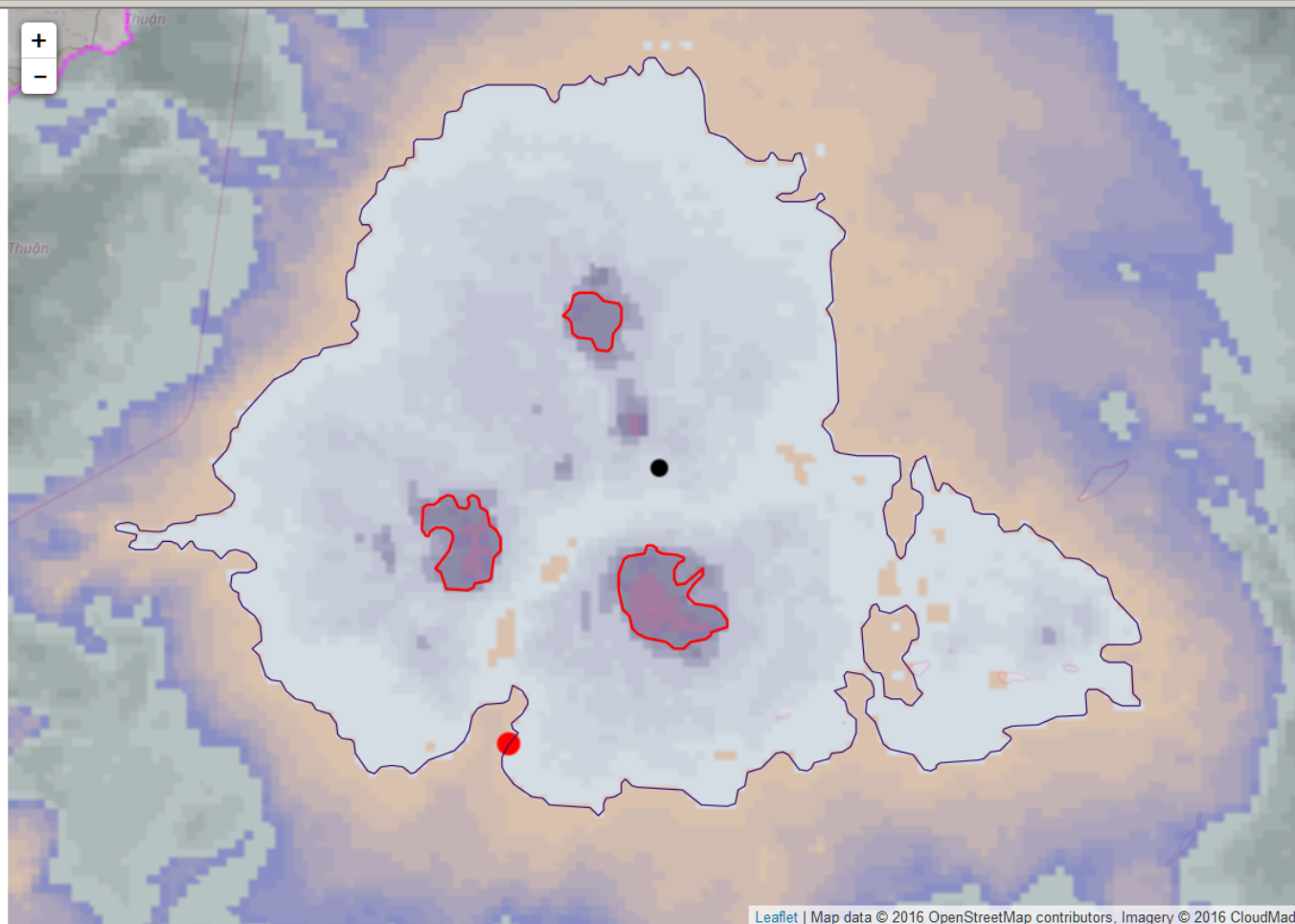
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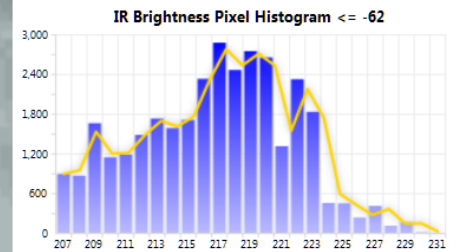
*Global maximum defines the enhanced region brightness & far right local maximum defines the EL overshoots.

EnhReg Brit: 219
ELO Brit: 229
TropT GFS: -77
ELT IR_est: -74

IR detected ELT



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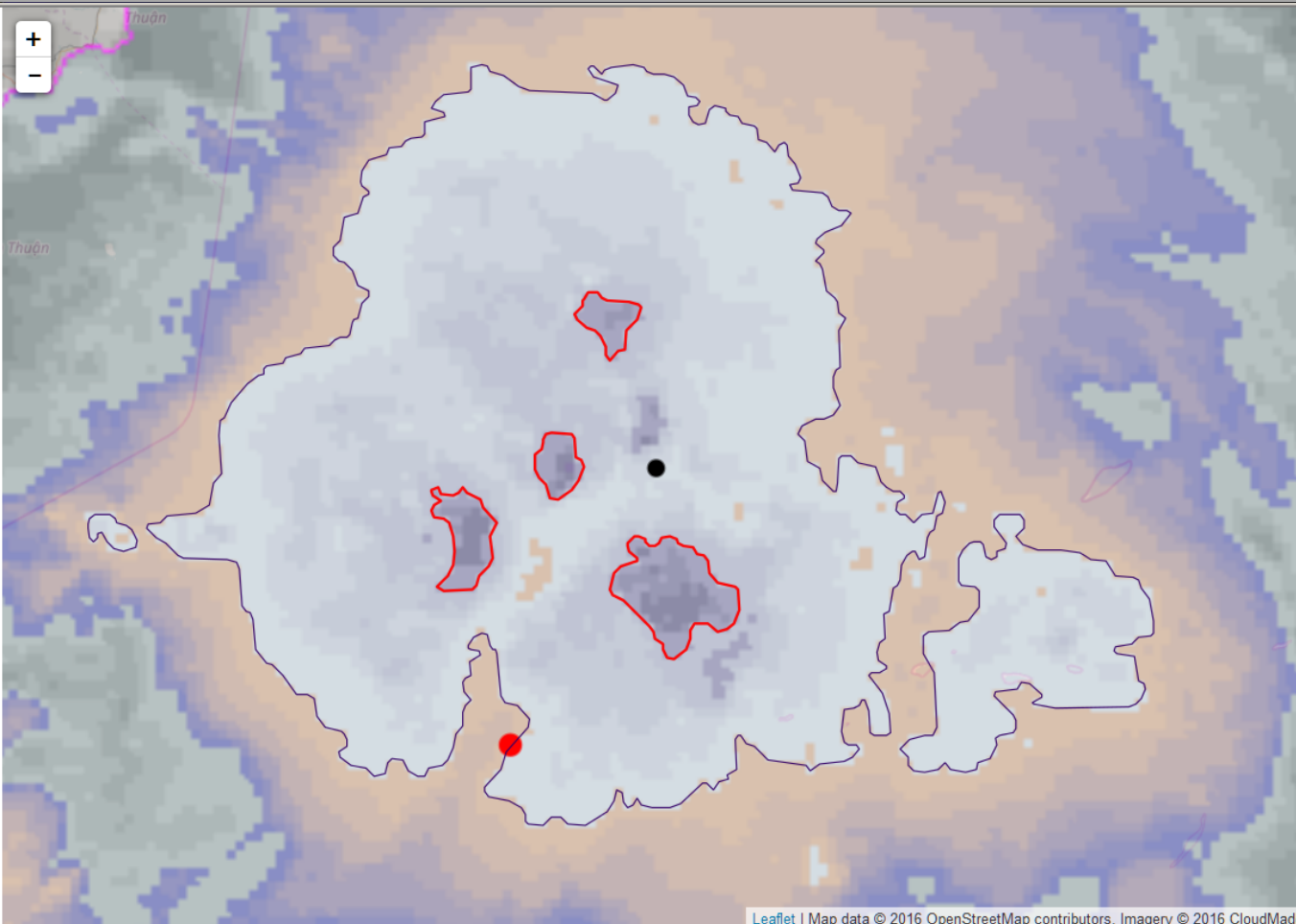


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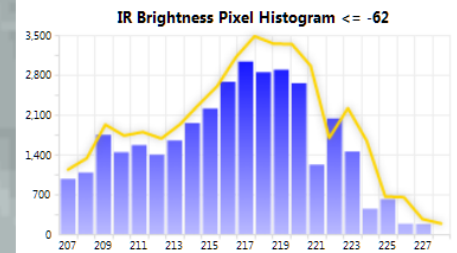
EnhReg Brit: 216
ELO Brit: 227
TropT GFS: -77
ELT IR_est: -71

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IR detected ELT



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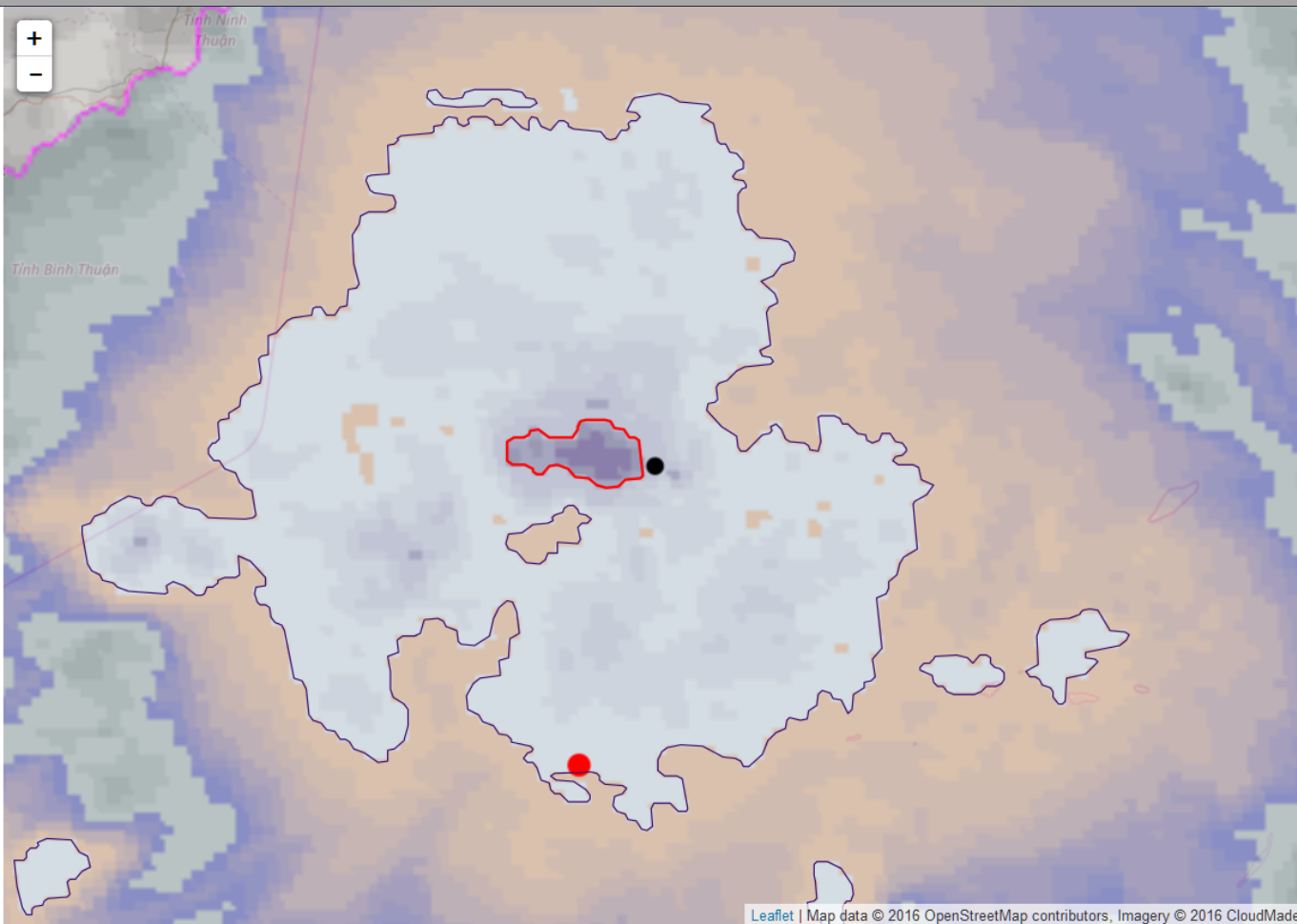
EnhReg Brit: 216

ELO Brit: 225

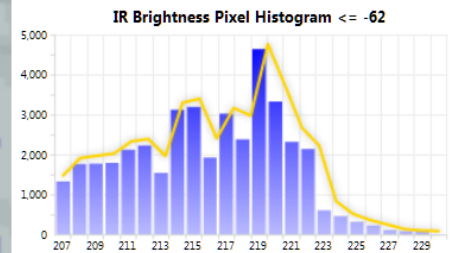
TropT GFS: -77

ELT IR_est: -71

IR detected ELT



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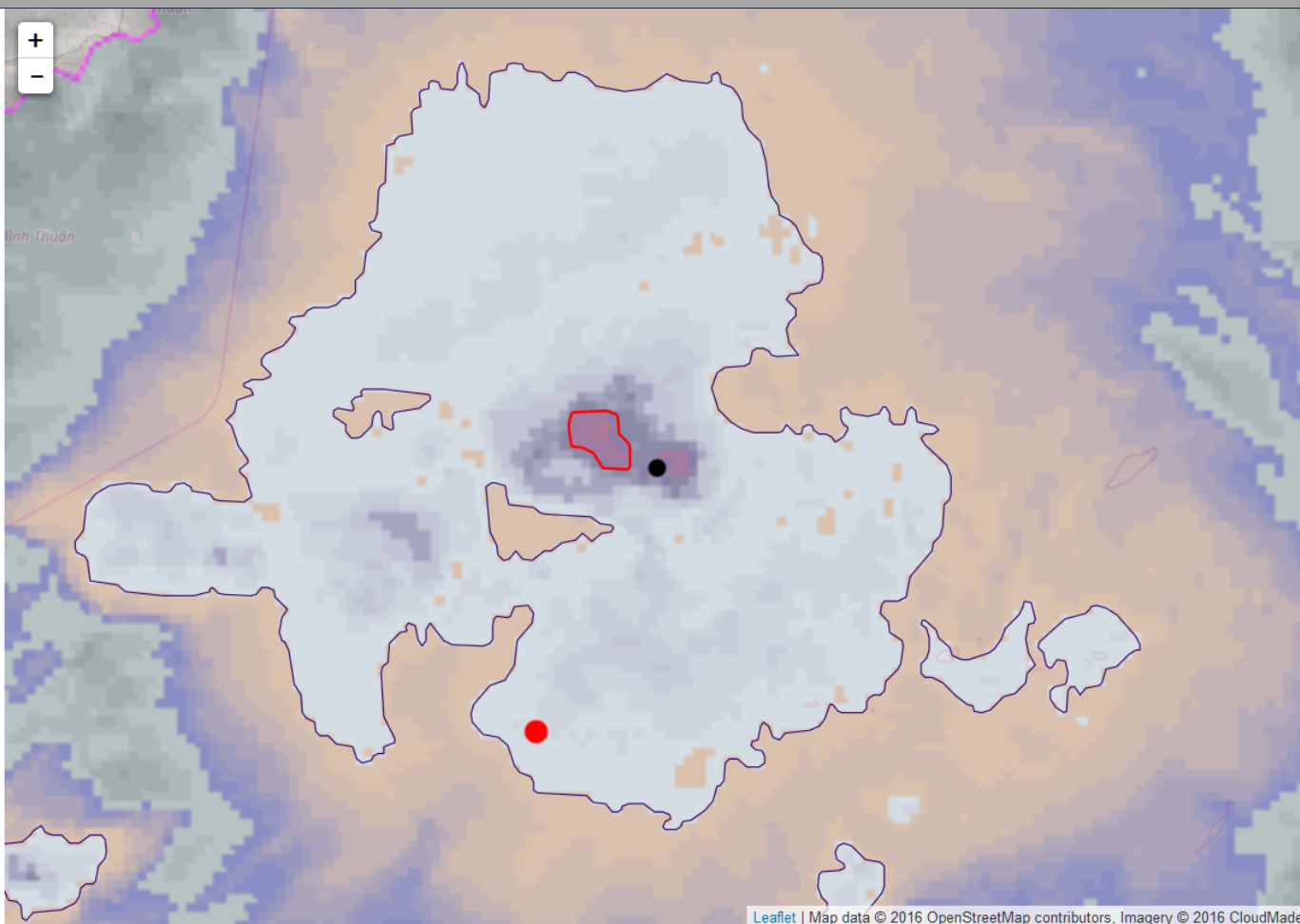


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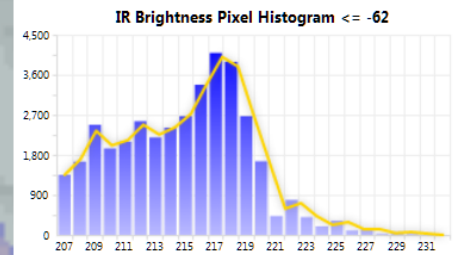
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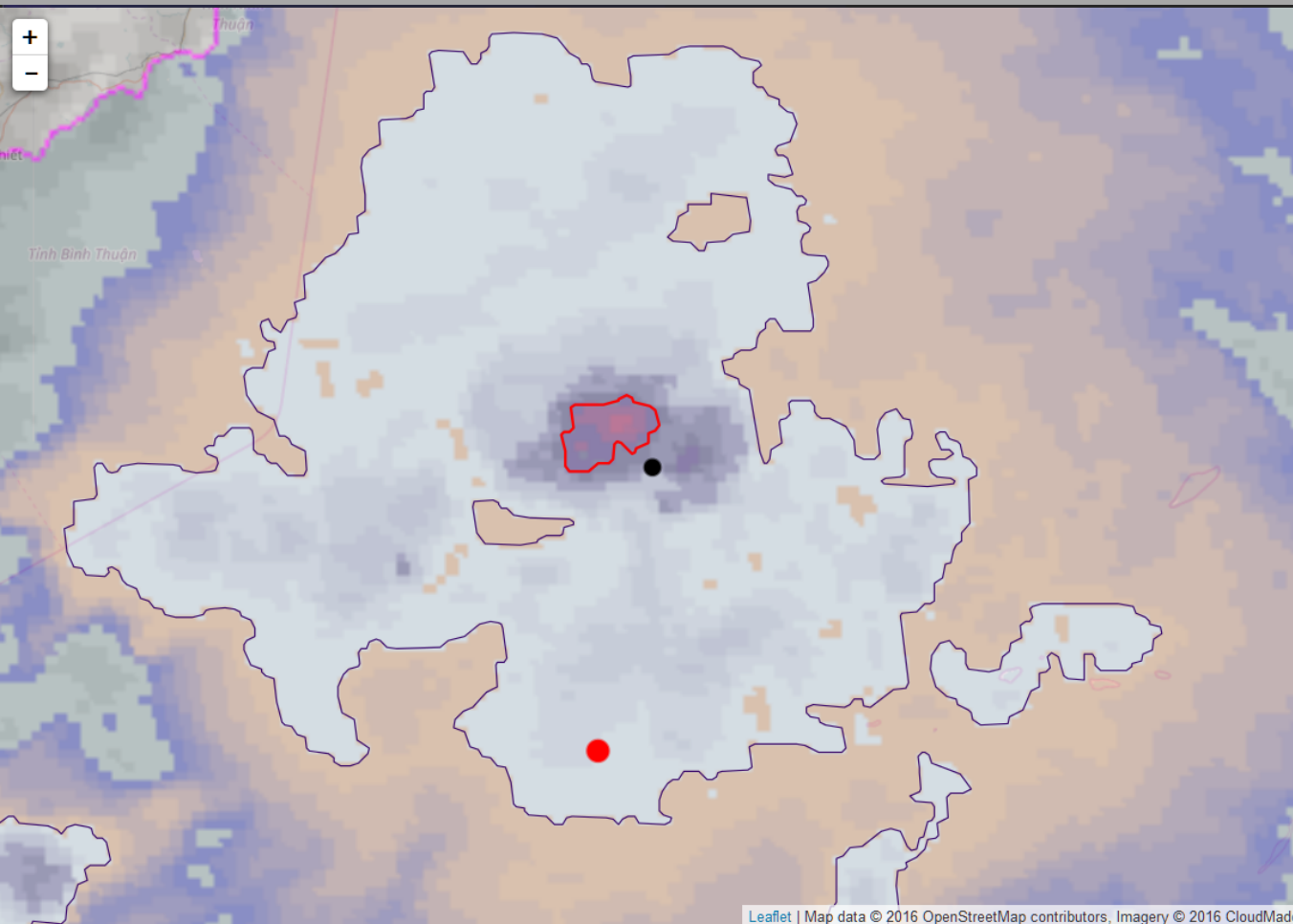
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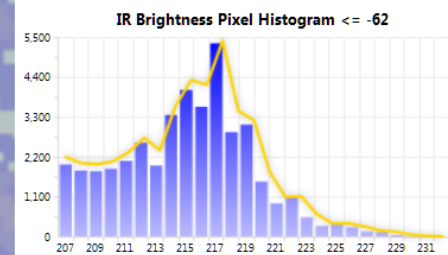
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