

Using ISC Data to Build a Prior of Seismicity for NET-VISA

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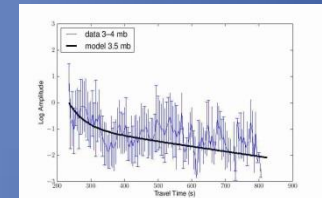
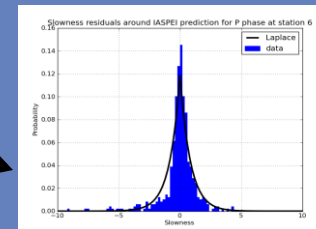
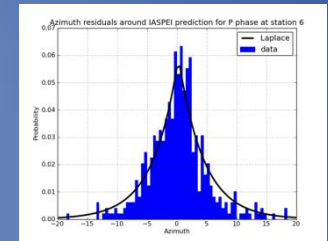
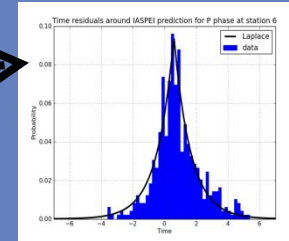
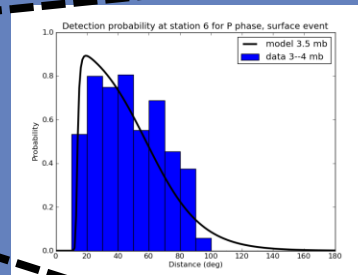
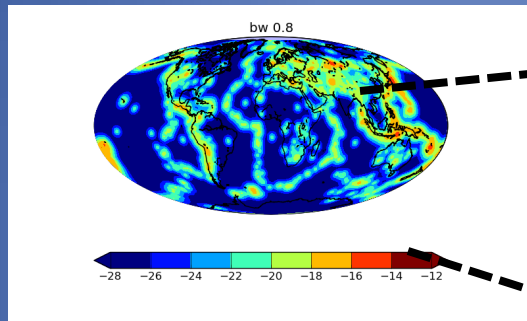


Overview

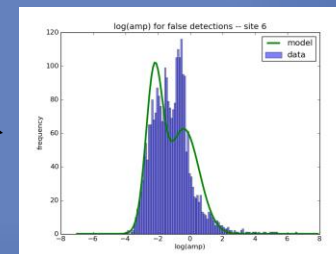
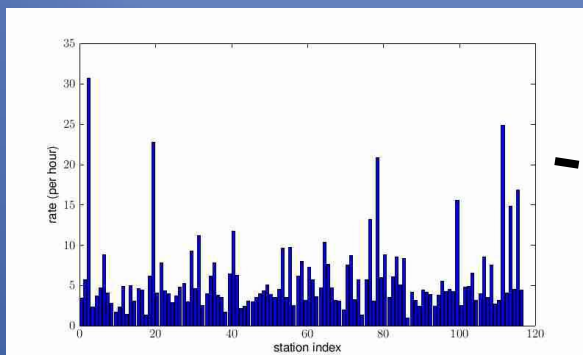
- Bayesian Approach
- Depth Model
- Learning a Depth Model from ISC Data
- Results
- Results on Explosions
- Deployment Progress

Bayesian Approach

Real



Noise

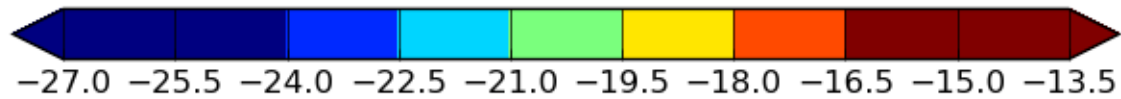
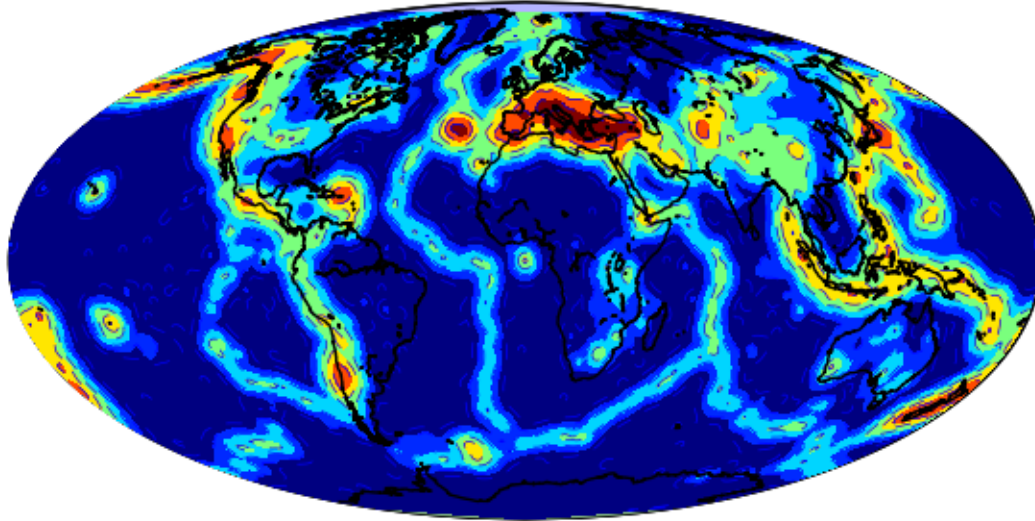


Prior

Likelihood

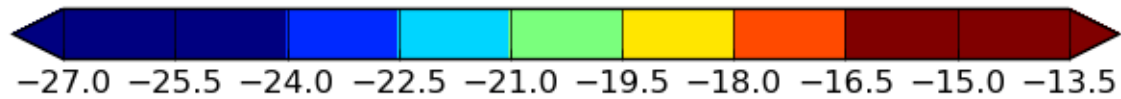
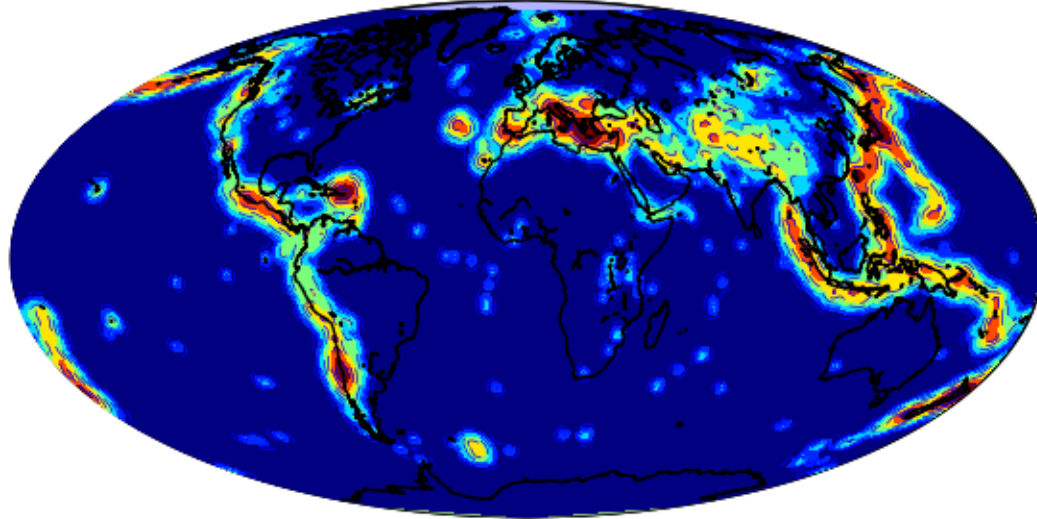
Depth 0 – 20 km

Location Density Depth 0 - 20



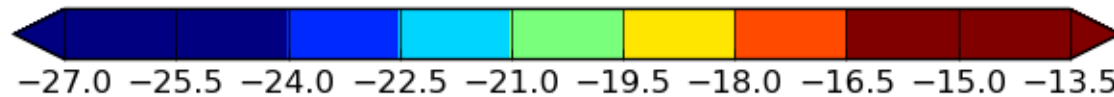
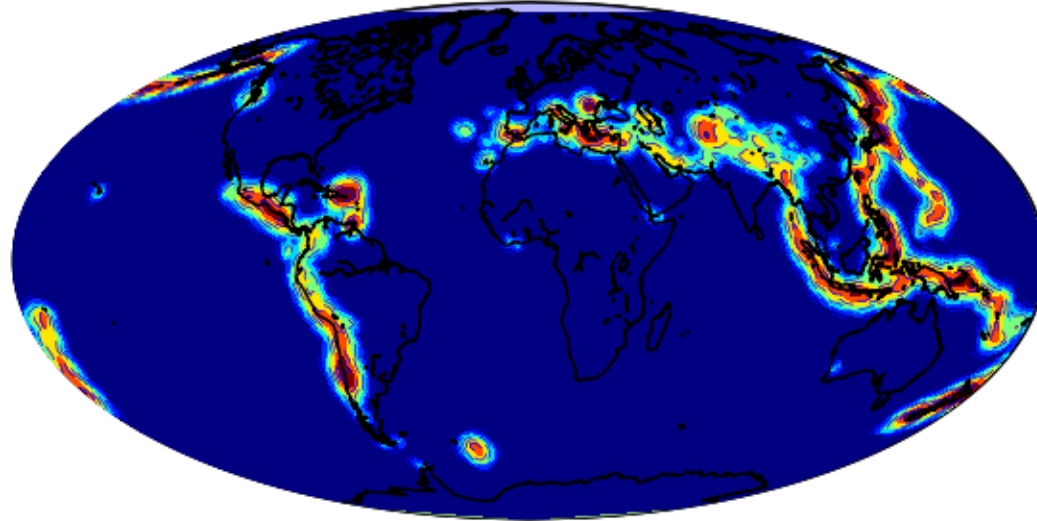
Depth 20 - 50

Location Density Depth 20 - 50



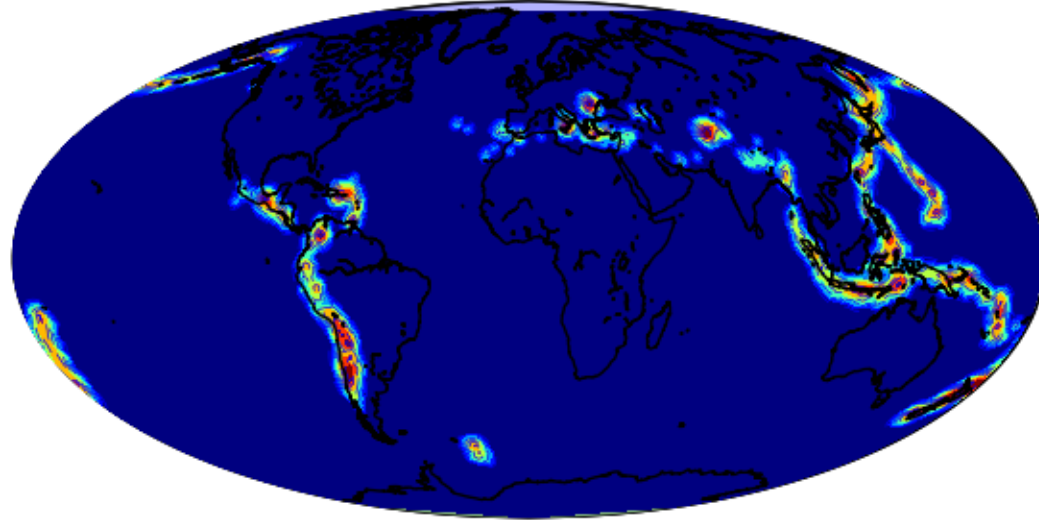
Depth 50 - 100

Location Density Depth 50 - 100



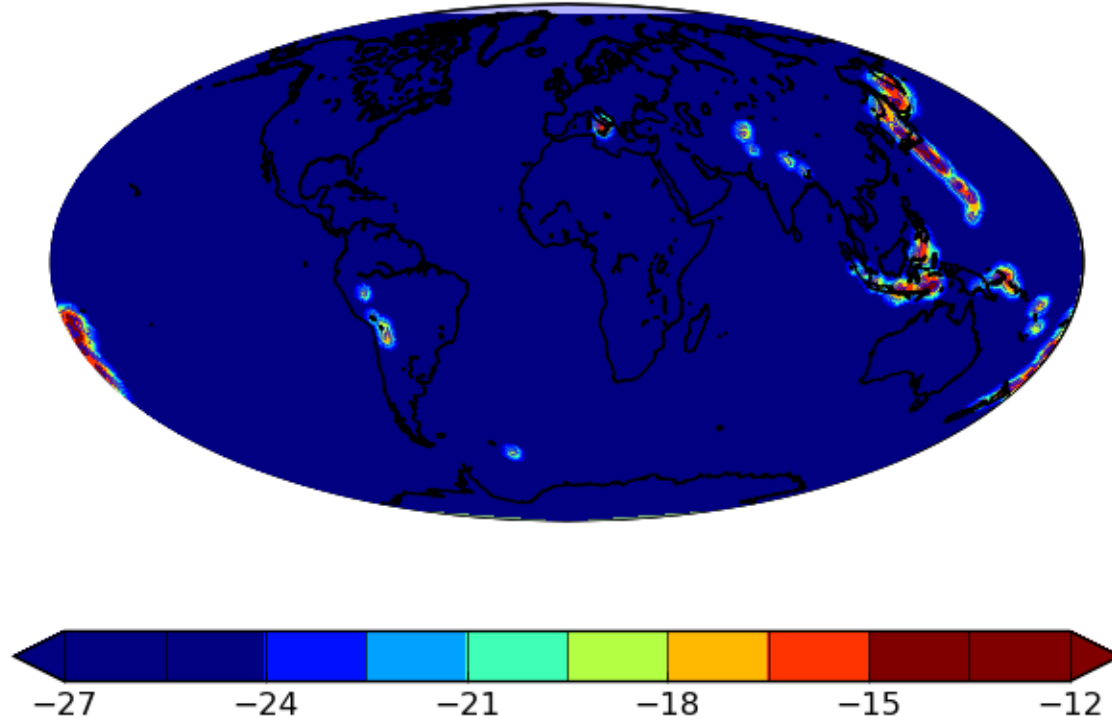
Depth 100 - 300

Location Density Depth 100 - 300



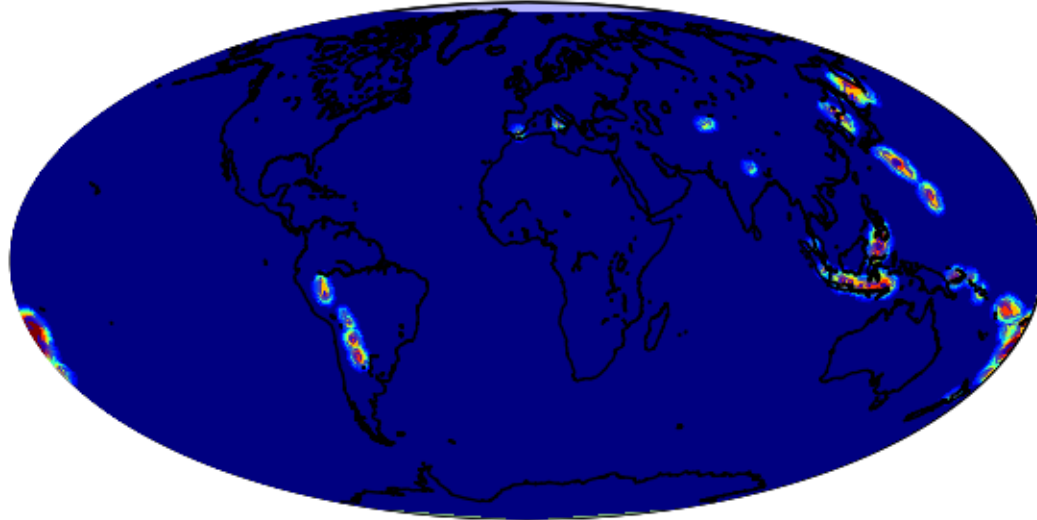
Depth 300 - 500

Location Density Depth 300 - 500

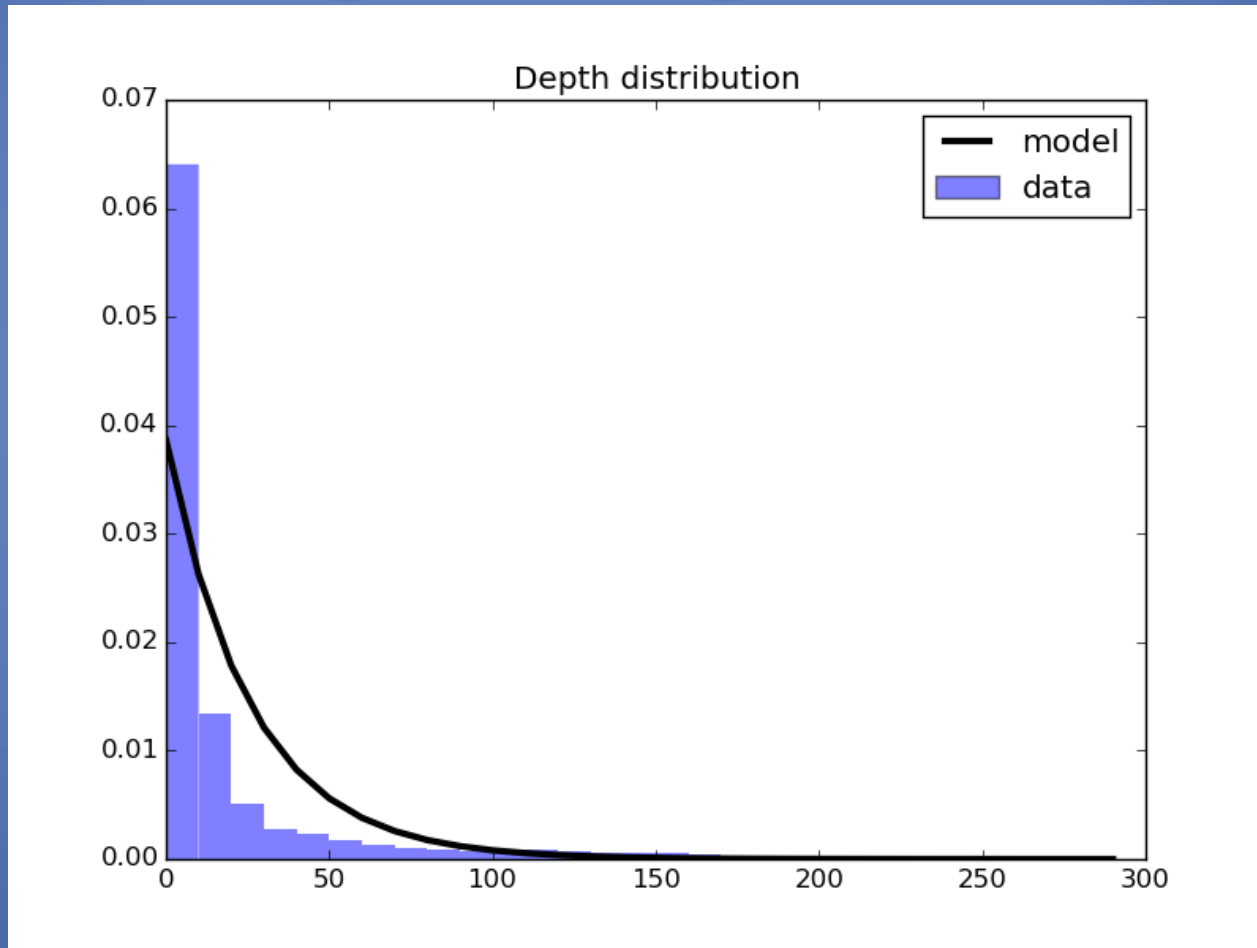


Depth 500 - 700

Location Density Depth 500 - 700

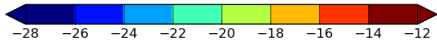
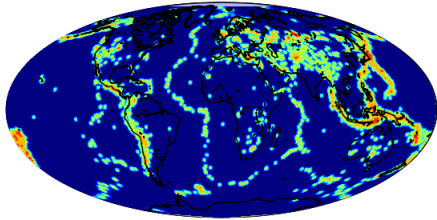


Probability of an event occurring at a given depth

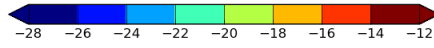
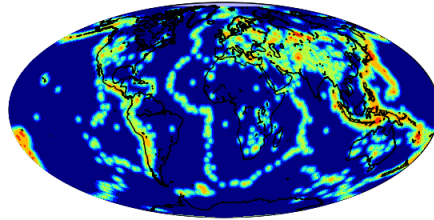


Kernel bandwidth selection using leave-one- out cross-validation

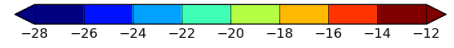
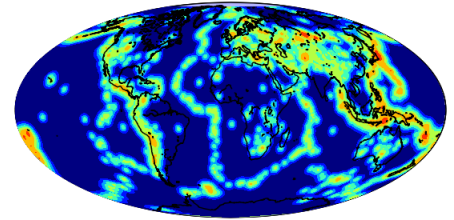
bw 0.2



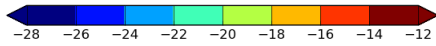
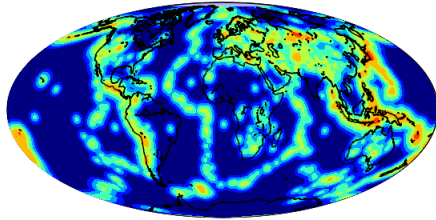
bw 0.4



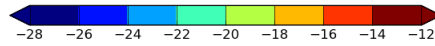
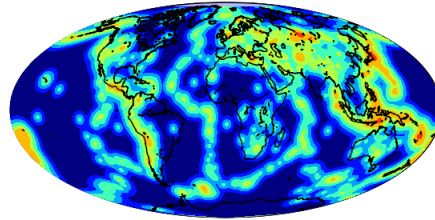
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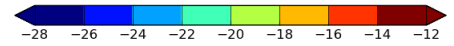
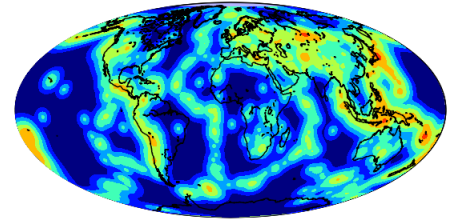
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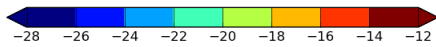
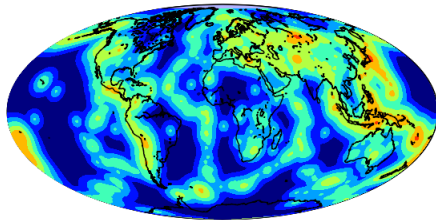
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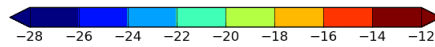
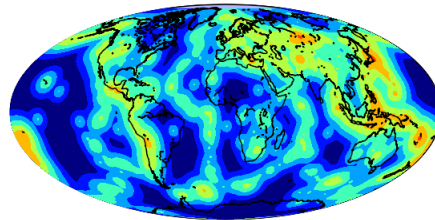
bw 1.2



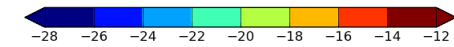
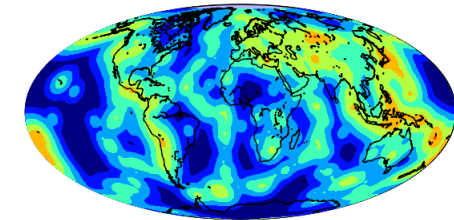
bw 1.4



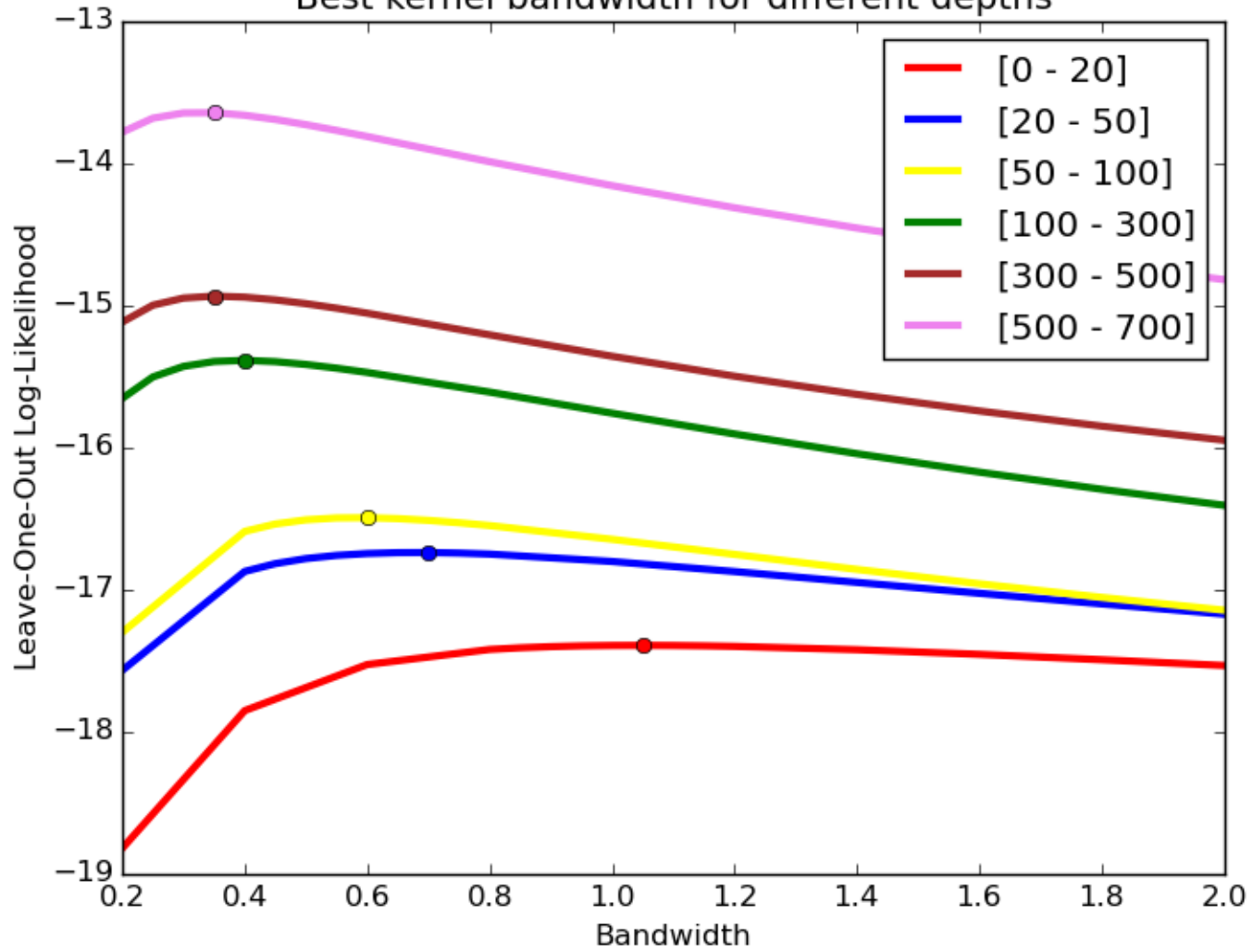
bw 1.6



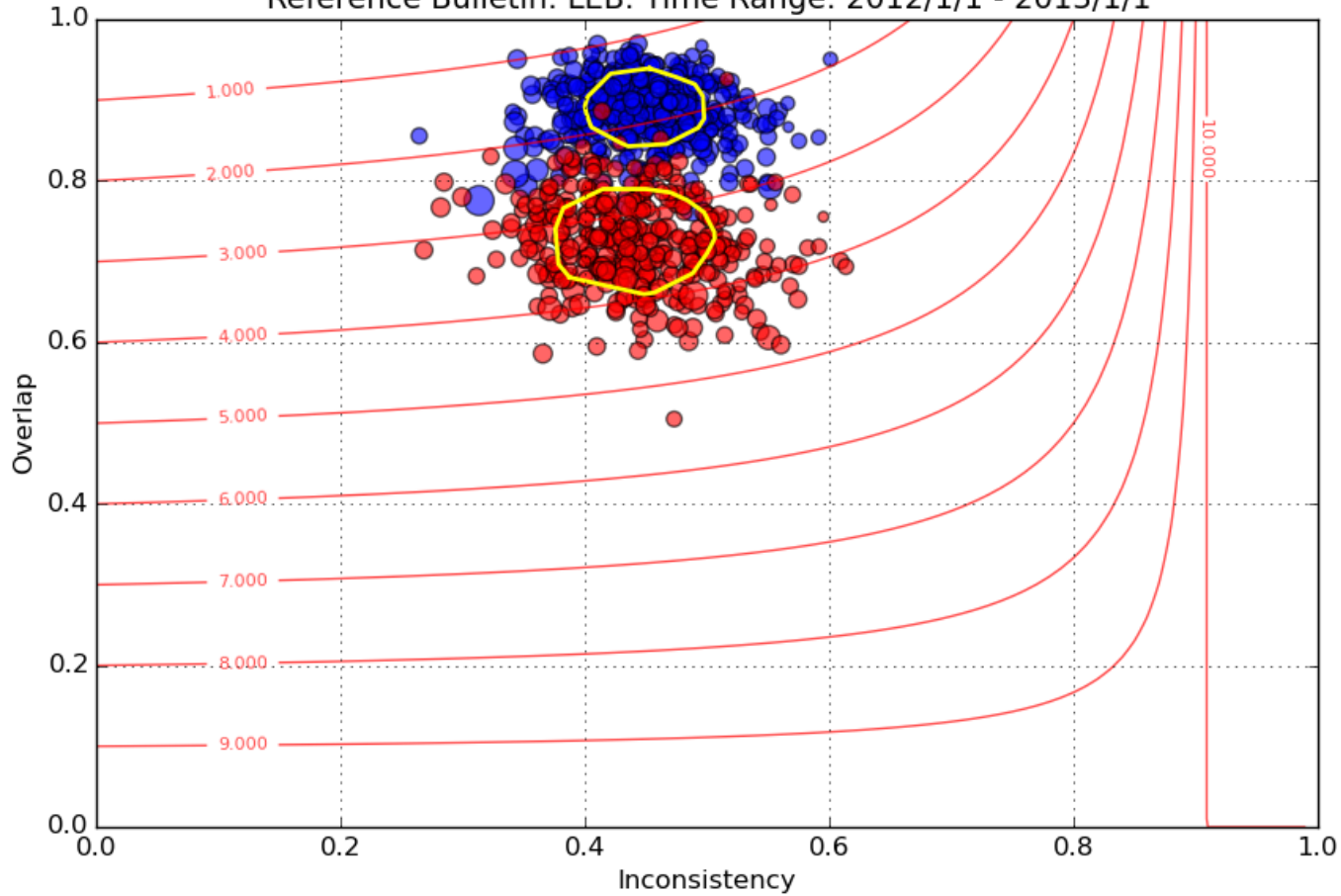
bw 1.8



Best kernel bandwidth for different depths

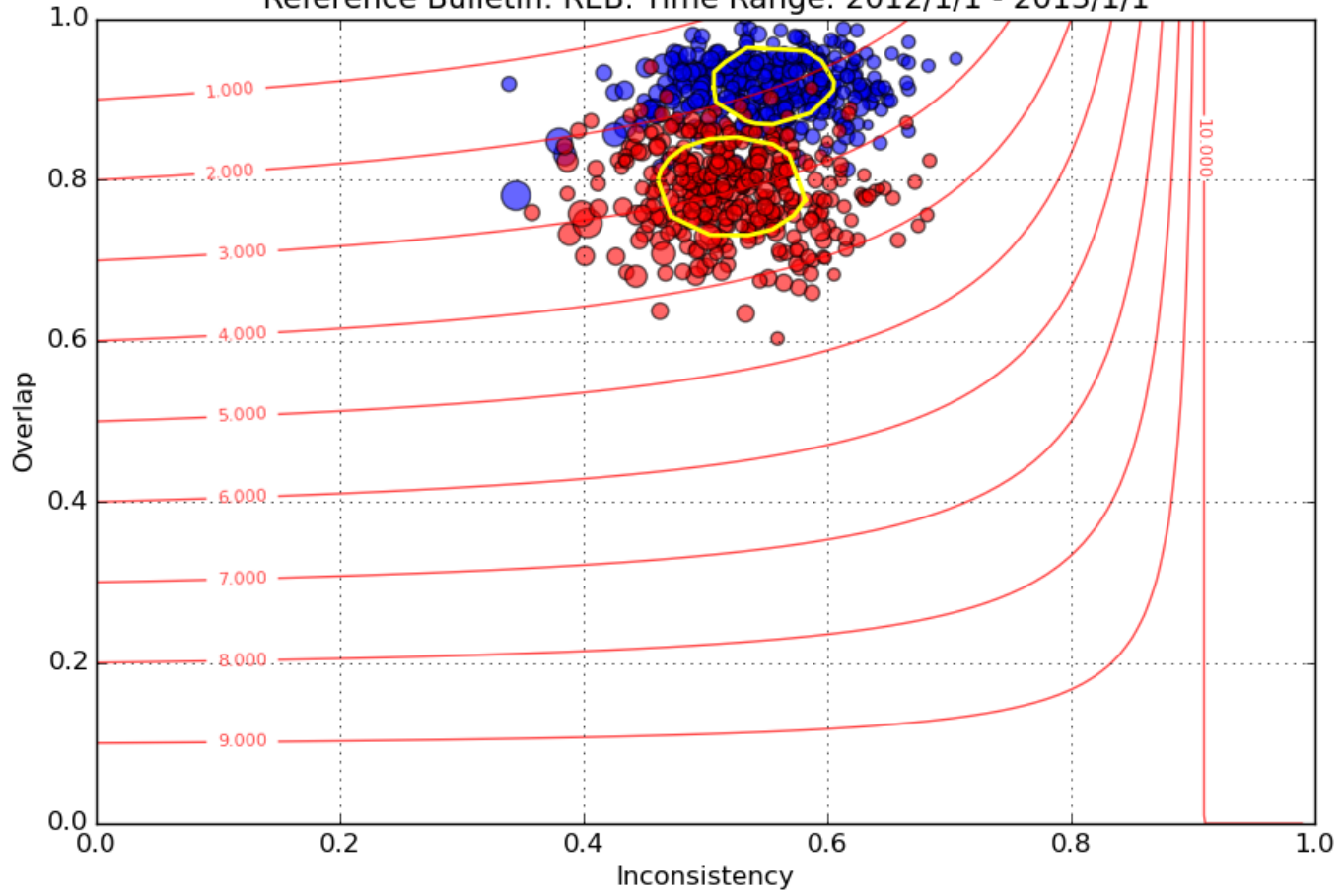


Reference Bulletin: LEB. Time Range: 2012/1/1 - 2013/1/1



●● v2.2.1 static EventLocationPrior
●● SEL3

Reference Bulletin: REB. Time Range: 2012/1/1 - 2013/1/1

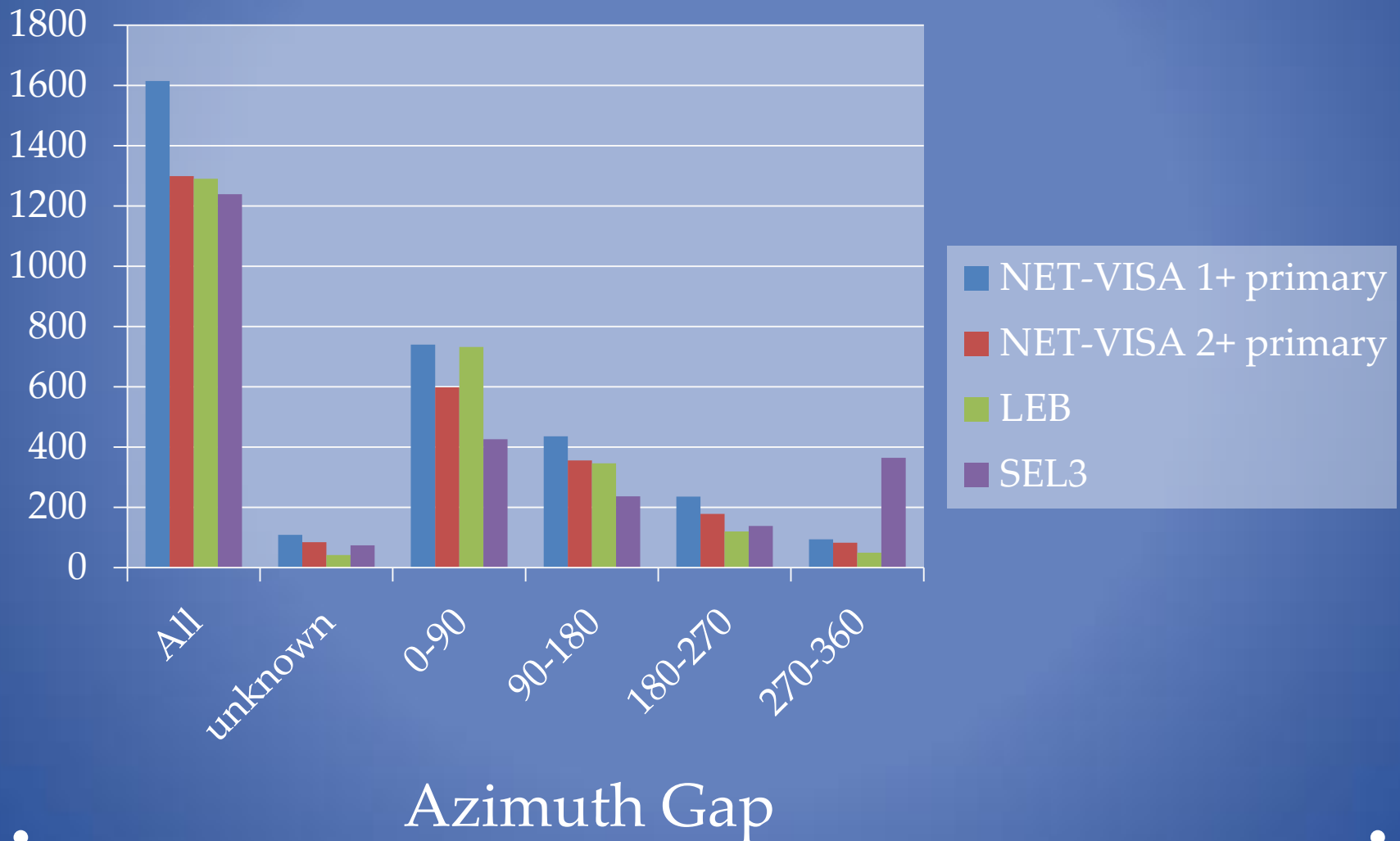


● v2.2.1 static EventLocationPrior
● SEL3

So what about
explosions?

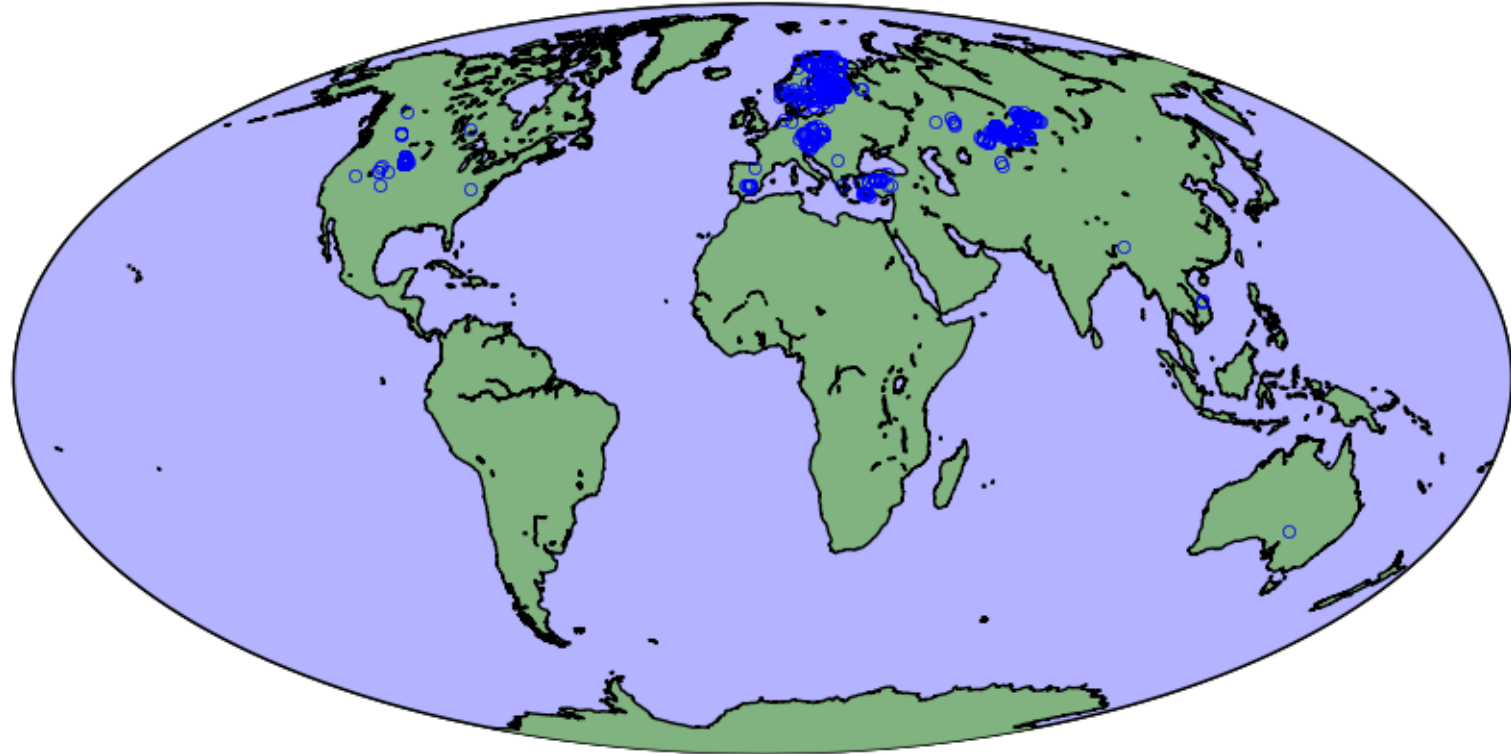


ISC Man-made events – 2012

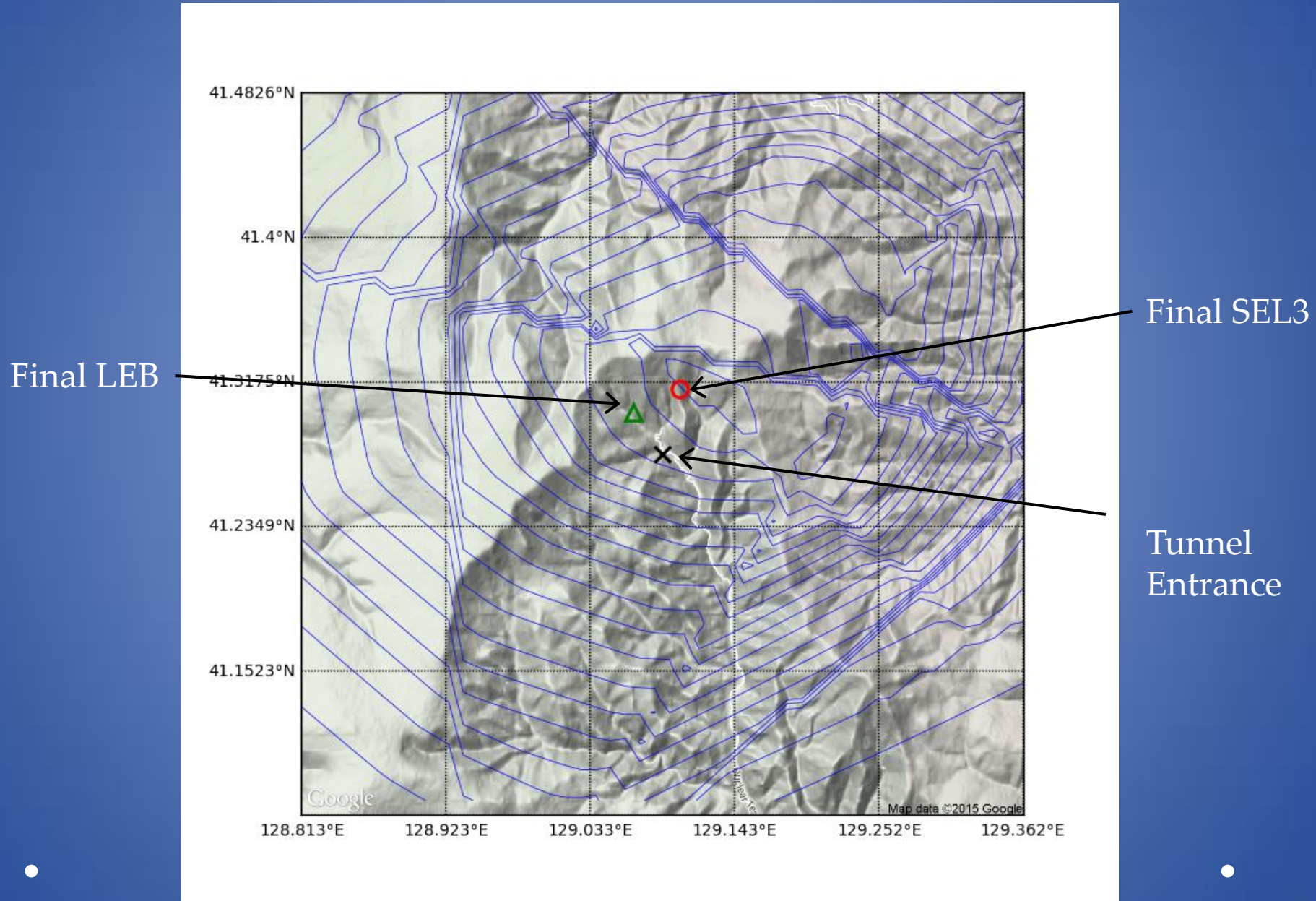


Detection of Man-made Events

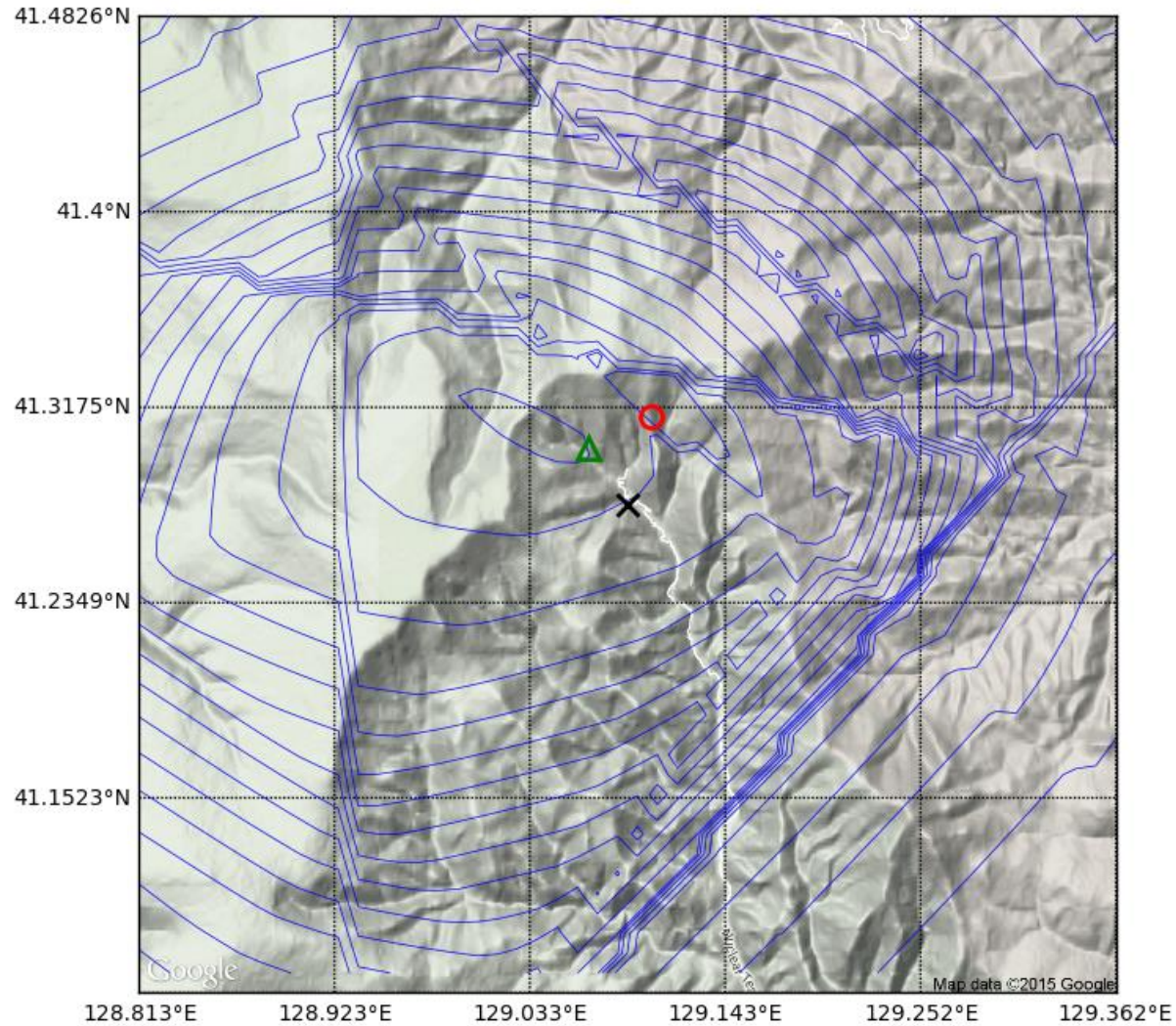
Manmade events in NET-VISA with 1 primary stations



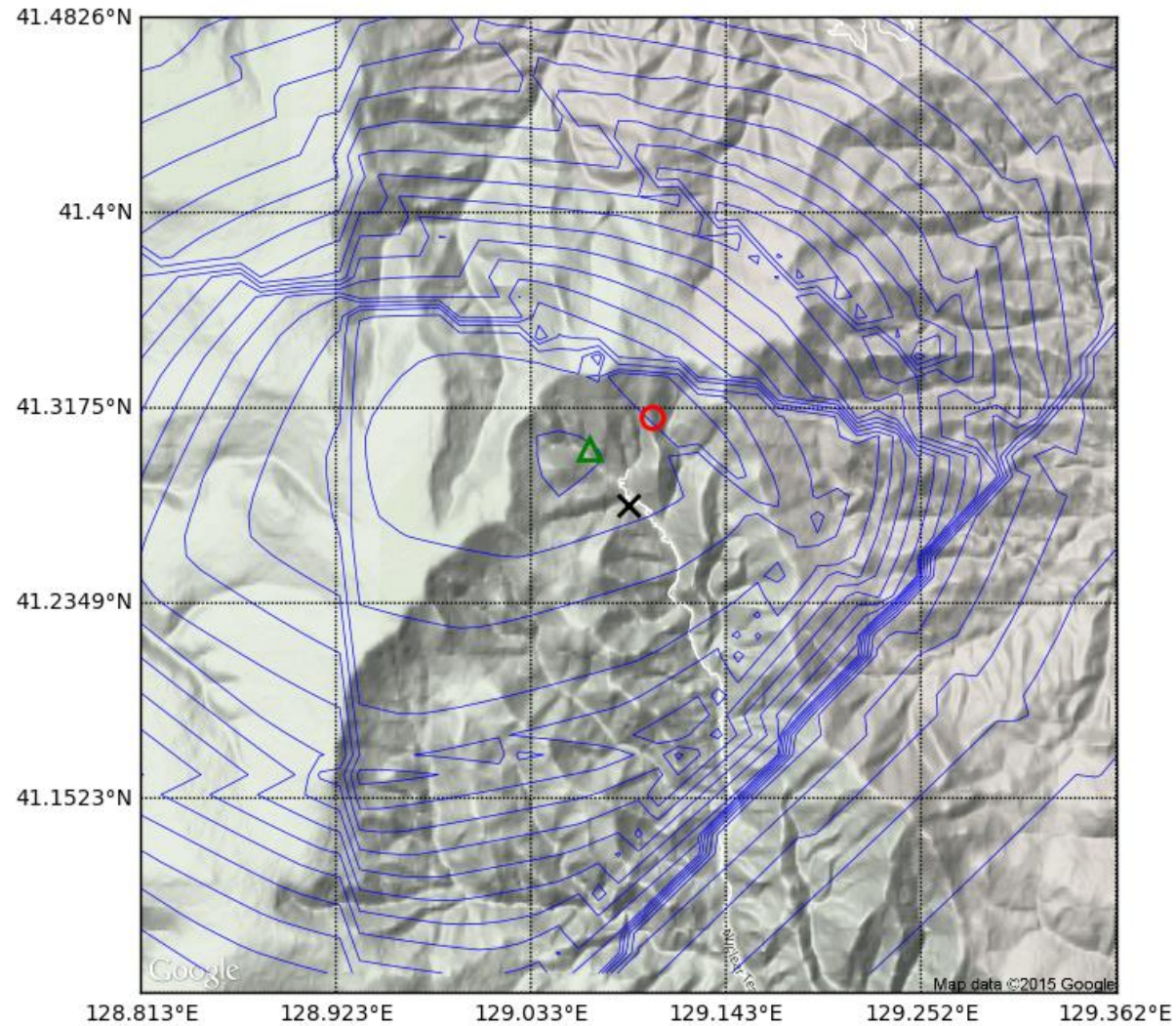
10 minutes after DPRK 3



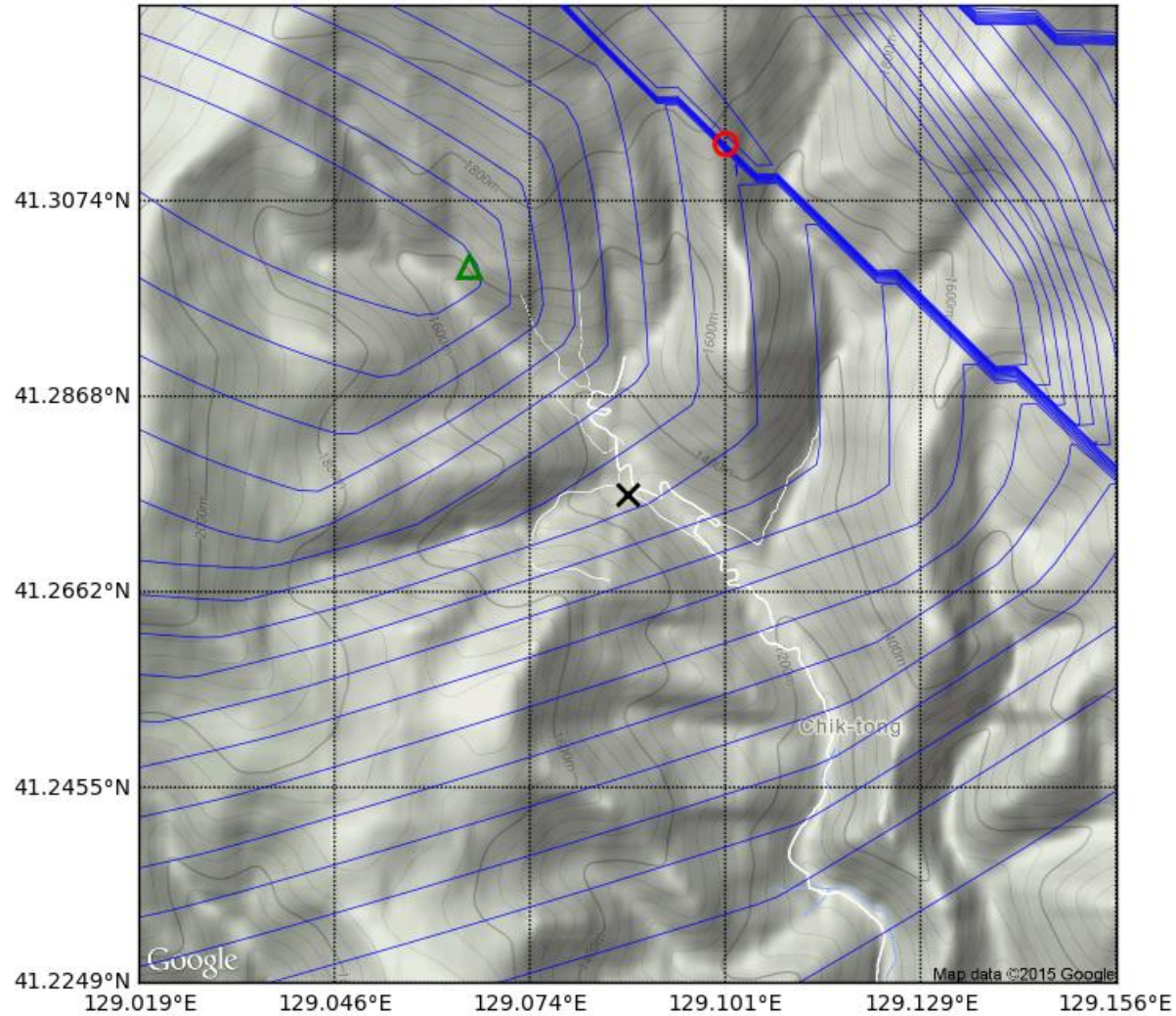
30 minutes after DPRK3



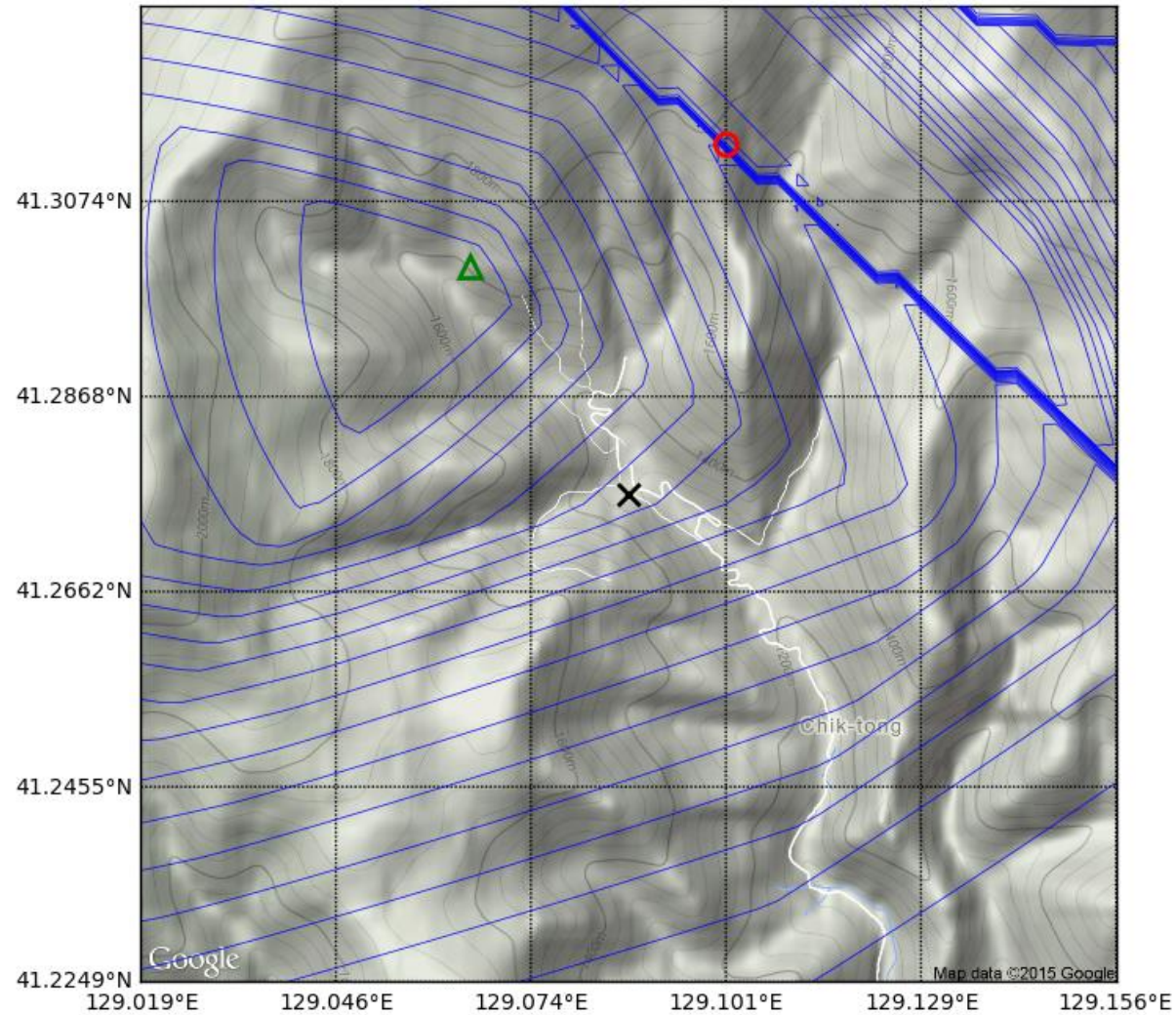
1 hour after DPRK3



30 minutes after DPRK3



1 hour after DPRK3



When is NET-VISA going to be deployed at IDC?

- Full Pipeline testing (presented at WEG 2015 by Ronan Le Bras)
- Website to show NET-VISA bulletin to the analysts (Noriyuki Kushida)
- **Planned**: Short-term tool to help analysts save time building events that are missing in GA