

CISN Real-Time and Post-Processing Magnitudes

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How are CISN preferred mags created?

Goal: Every earthquake should have a magnitude

- Real-time systems -- 1 to 10 minutes
- Duty Seismologist -- 15 minutes
- Routine Post-Processing -- days
- Long-term catalog improvements -- years

CISN Magnitudes

- Occasionally go back and correct magnitudes
- A few years back calibrated ML (Uhrhammer et al, 2011) – implemented going forward & back in time ???
- Working on calibrating amps from short-period instruments for very small quakes

NCSN Magnitudes

This is for both Real-Time and post-processing

- **Md** up to 3.0 – available in ~90sec
- **ML** up to 3.5, -- ~ 4 minutes
- then **Mw** -- ~ 7 minutes

NCSN Magnitudes

origin time 17:31:37

Alarm Action	State	Cnt	elapsed time	comment
CUBE2EIDS	COMPLETED	1	6/3/12 17:31:54 0:00:17	quicklook
BeltPager	COMPLETED	1	6/3/12 17:34:58 0:03:21	ML
NCSSMail	COMPLETED	1	6/3/12 17:34:58 0:03:21	
CUBE2EIDS	COMPLETED	2	6/3/12 17:35:00 0:03:23	
ShakeMap	COMPLETED	1	6/3/12 17:35:00 0:03:23	ShakeMap
ShakeMap	COMPLETED	2	6/3/12 17:36:19 0:04:42	ShakeMap
BeltPager	COMPLETED	2	6/3/12 17:38:08 0:06:31	
CUBE2EIDS	COMPLETED	3	6/3/12 17:38:08 0:06:31	
NCSSMail	COMPLETED	2	6/3/12 17:38:08 0:06:31	
ShakeMap	COMPLETED	3	6/3/12 17:38:10 0:06:33	
TMTSDone	COMPLETED	1	6/3/12 17:38:10 0:06:33	MT

Alarm Action	State	Cnt	Time (from: dcucb)
BeltPager	COMPLETED	1	6/3/12 17:40:48 0:09:11
CUBE2EIDS	COMPLETED	1	6/3/12 17:40:48 0:09:11
NCSSMail	COMPLETED	1	6/3/12 17:40:48 0:09:11
ShakeMap	COMPLETED	1	6/3/12 17:40:49 0:09:12
MTlocalmail	COMPLETED	1	6/3/12 17:55:33 0:23:56 MT review
MTmail	COMPLETED	1	6/3/12 17:55:33 0:23:56
MTweb	COMPLETED	1	6/3/12 17:55:33 0:23:56
BeltPager	COMPLETED	2	6/3/12 17:55:39 0:24:02
CUBE2EIDS	COMPLETED	2	6/3/12 17:55:39 0:24:02
NCSSMail	COMPLETED	2	6/3/12 17:55:39 0:24:02
ShakeMap	COMPLETED	2	6/3/12 17:55:39 0:24:02

SCSN Magnitudes

- **Automated Magnitudes available:**
 - $M_L < 6.0$ – 80 sec or 140 sec
 - $M_e \geq 6.0$ – temporary mag.; 140 sec
 - $M_w \geq 5.0$ -- ~10 minutes
 - $M_w > 6.0$ -- agree with NEIC; ~20 minutes
- **Duty seismologist review ~15 min.**
- **Post-Processing**
 - M_h - for very small quakes < 1.5

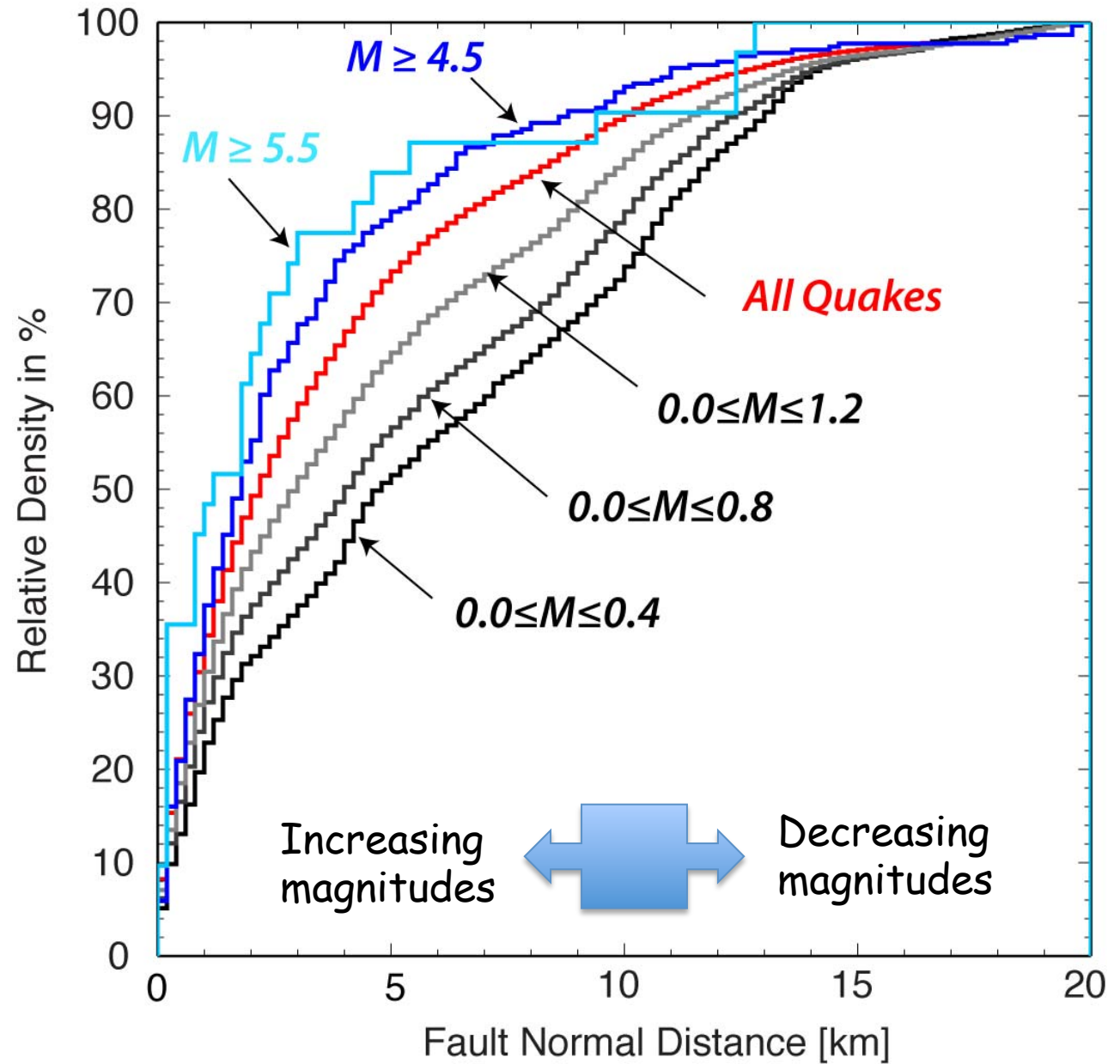
Proposed new SCSN Mw for $M \geq 2.0$

- Spectral method by B. Edwards & A. Rietbrock
- Use Hauksson & Shearer 3D Q-Model to determine t^*
- Multitaper fitting method to long period end of S-wave spectra
- Invert for geometrical spreading and station corrections
- 12 years of waveform data are available
- Available in ~ 3 minutes but depends on size

ANSS ComCat Information

- CUBE format obsolete
- Using QuakeML format
- All solutions for an event visible
- Catalog versioning is being discussed
- ANSS catalog at UC Berkeley to be discontinued
- Real-time data transport today: EIDS
- Real-time data transport tomorrow: PDL
 - (product distribution layer)
- “Best Product” for each earthquake parameter

**Big quakes
are closer
to big
faults**



Hypocenter Distance from SCEC/CFM4

