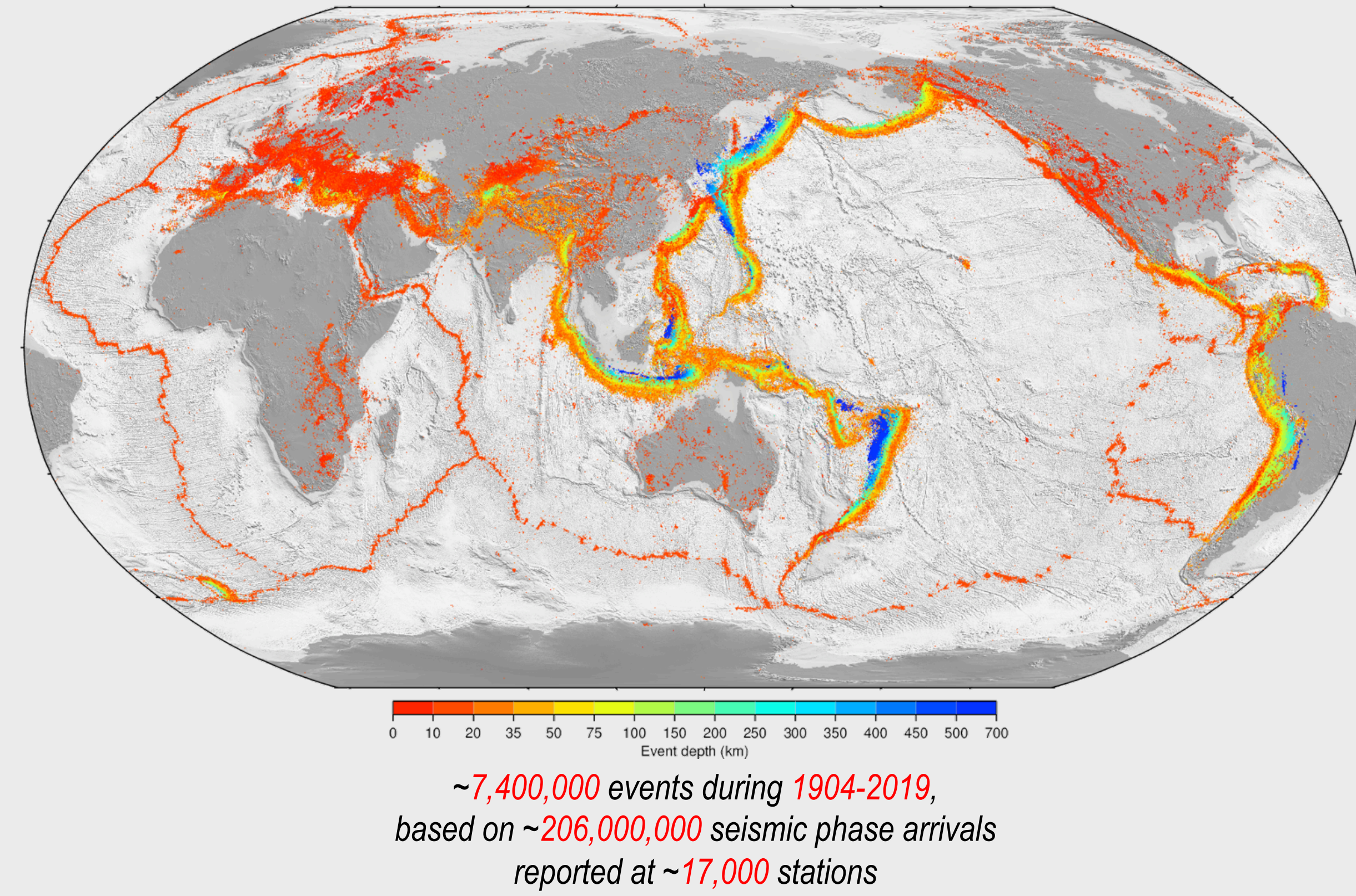


The main task of the ISC

The main task of ISC is to produce the most complete and accurate long-term bulletin of the worldwide seismicity based on reports from other agencies.



Benefiting from its international, non-profit and non-governmental status, the ISC regularly receives reviewed bulletin data from ~150 agencies in ~100 countries



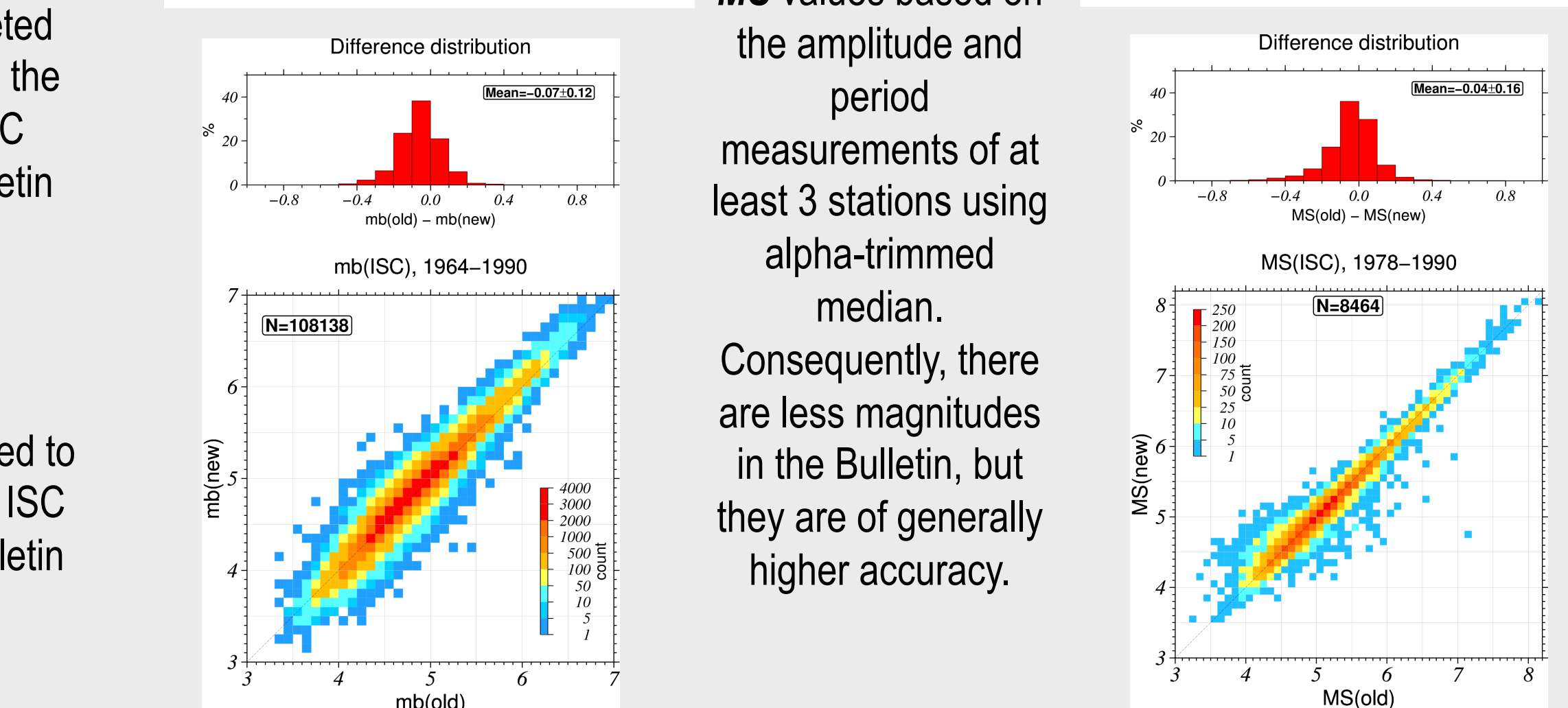
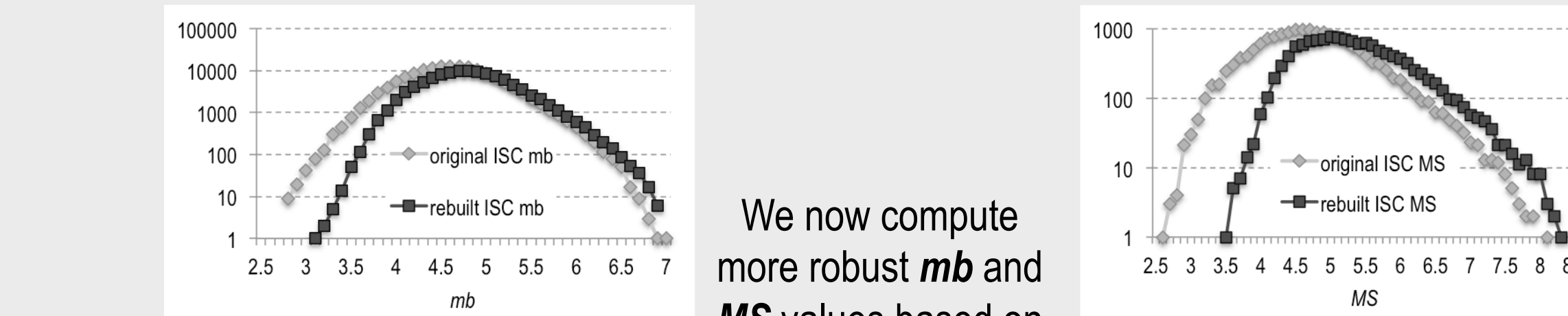
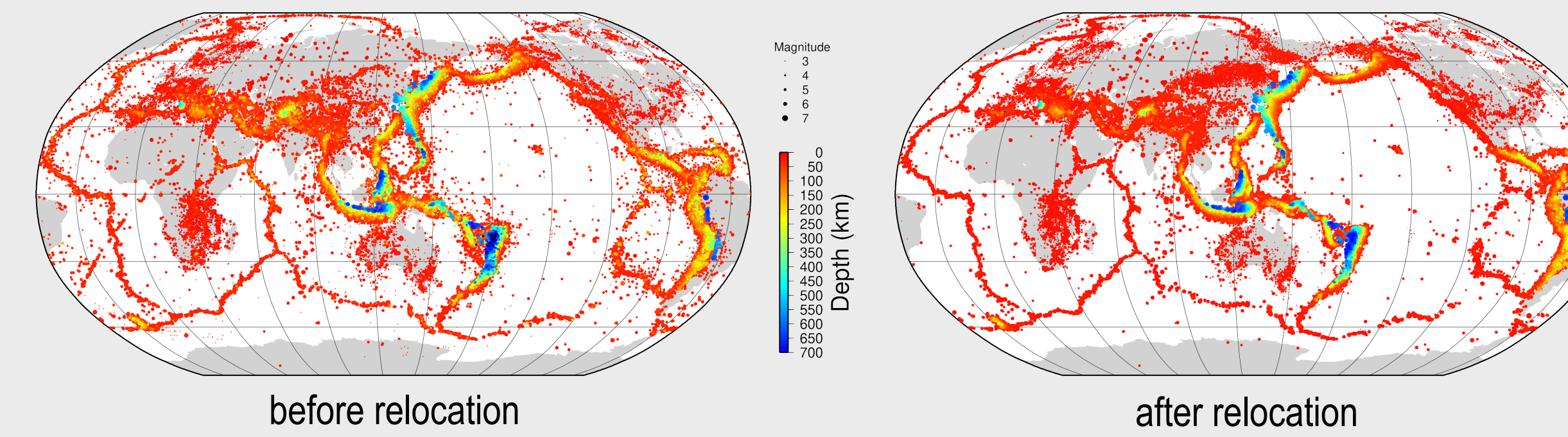
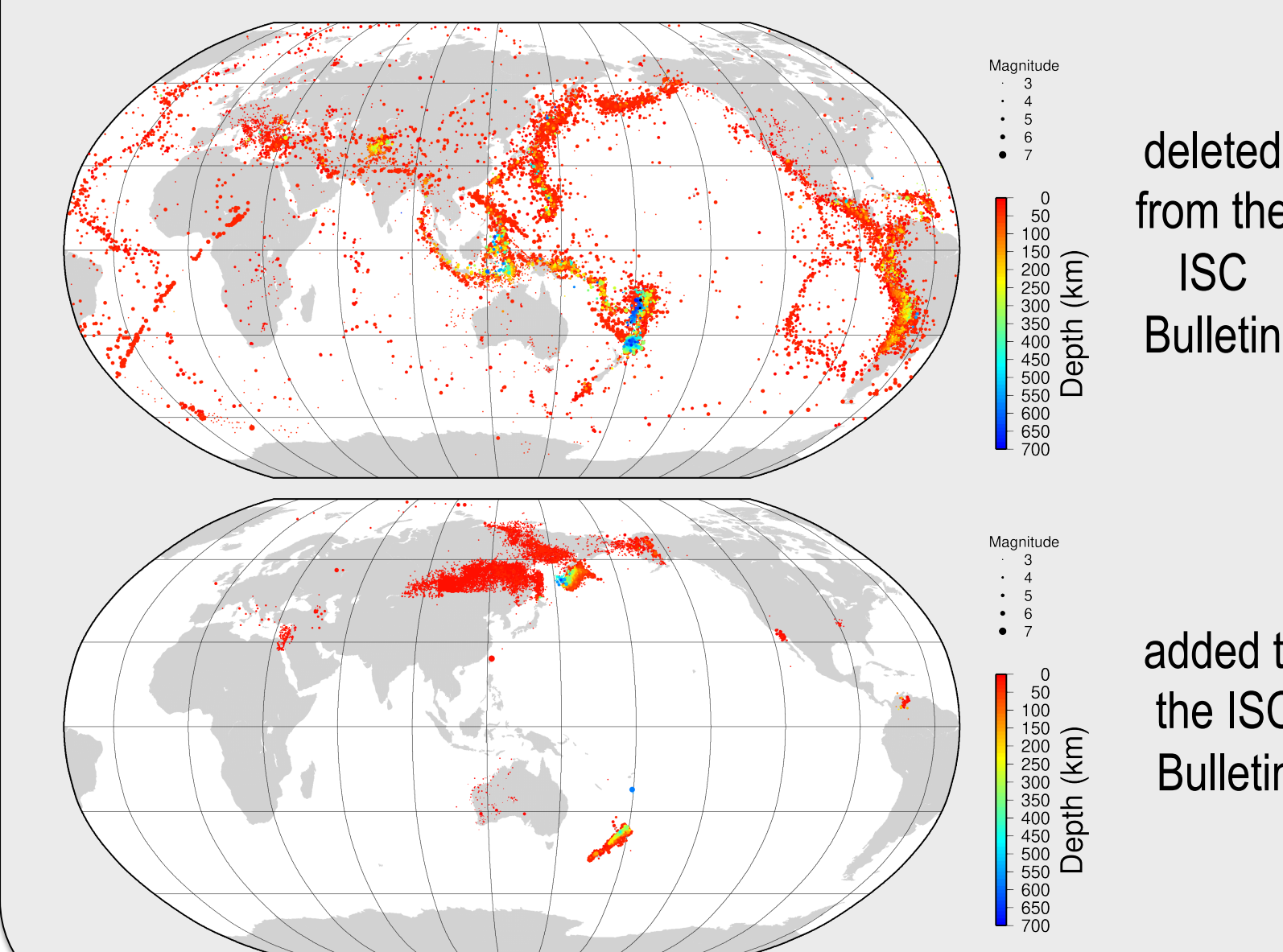
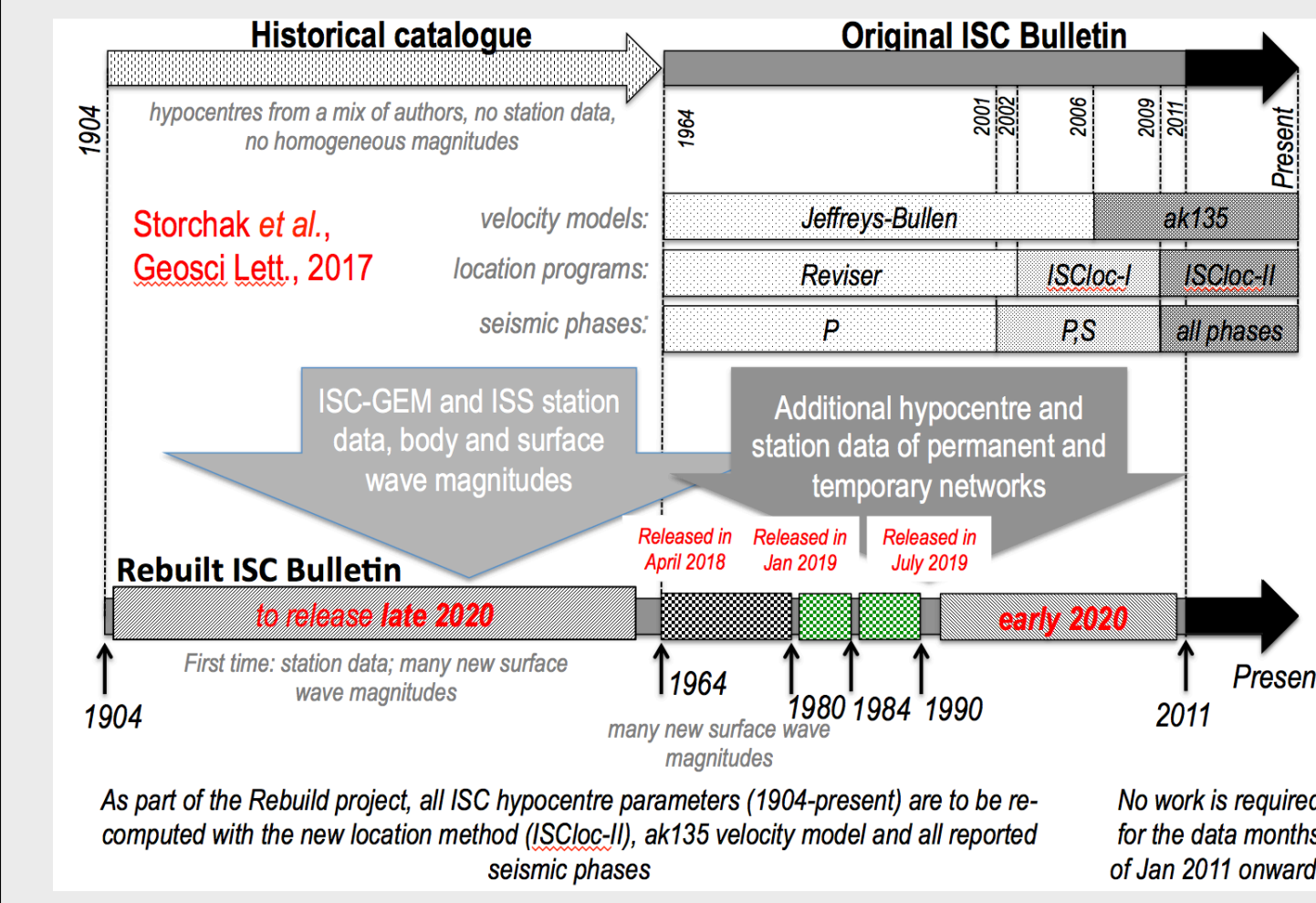
As a non-governmental organization, the ISC relies on financial support of 68 Member-Institutions in 50 countries and 10 Grantors / Sponsors:



The routine operations at the International Seismological Centre (ISC) continue since 1964. This poster briefly describes additional new components of the ISC Bulletin and associated ISC datasets released to scientific community during the first half of 2019. Several oral presentations by the ISC staff will give further details.

The ISC Bulletin for 1964-1990 period has been rebuilt

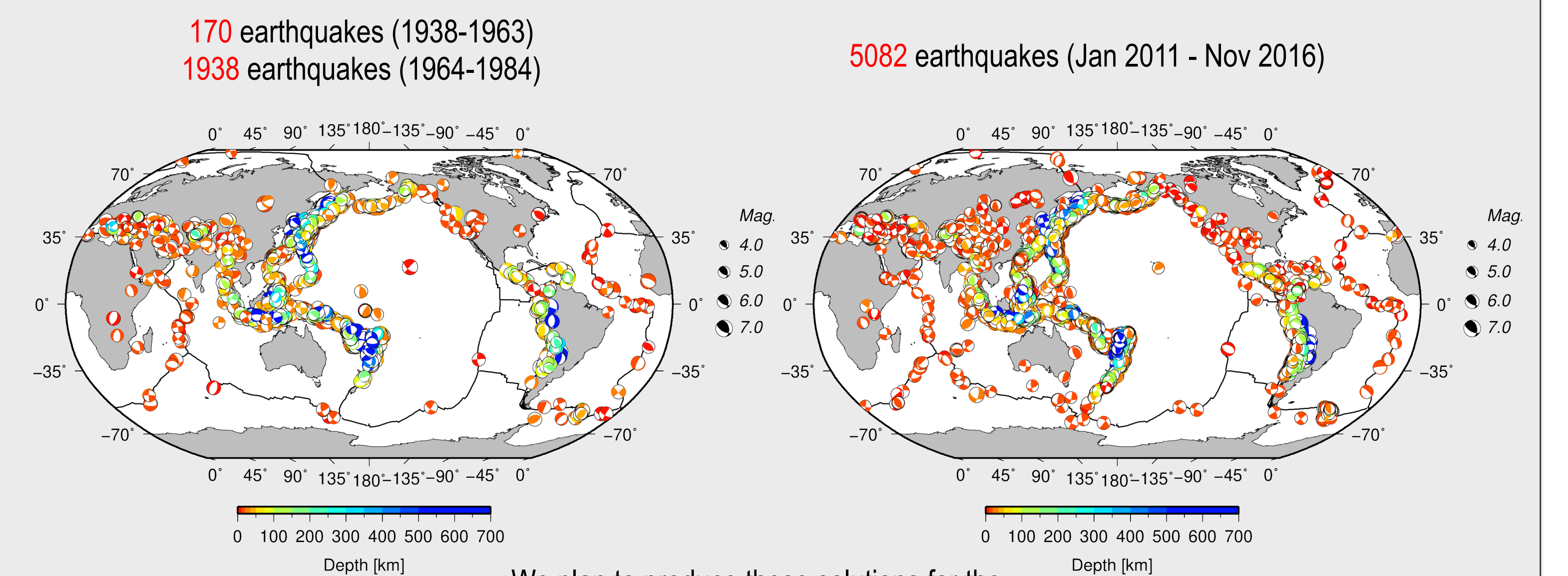
We are currently rebuilding the original ISC Bulletin by re-compute all ISC hypocentres using current location algorithm and ak135 velocity model, re-computing all magnitudes to make them more robust, cleaning-up the Bulletin from unreliable events and adding previously unavailable datasets from permanent and temporary station deployments.



We now compute more robust **mb** and **MS** values based on the amplitude and period measurements of at least 3 stations using alpha-trimmed median. Consequently, there are less magnitudes in the Bulletin, but they are of generally higher accuracy.

Focal mechanisms (1938-1984, 2011-2016) determined by the ISC

The ISC Bulletin always contained source mechanisms and moment tensors reported by other agencies: GCMT, NEIC, NIED, MEDNET, SSD etc. We recently started regular publication of source mechanisms **determined by the ISC**, based on directions of P-wave first motions (reported by agencies and measured at the ISC using waveforms)



We plan to produce these solutions for the entire period (1938-2016) as soon as the Rebuild project has been completed



In this work we took advantage of:

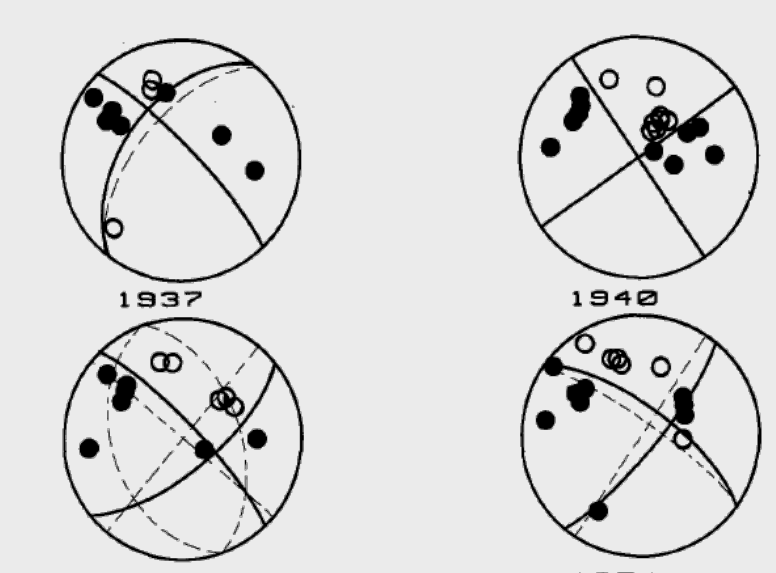
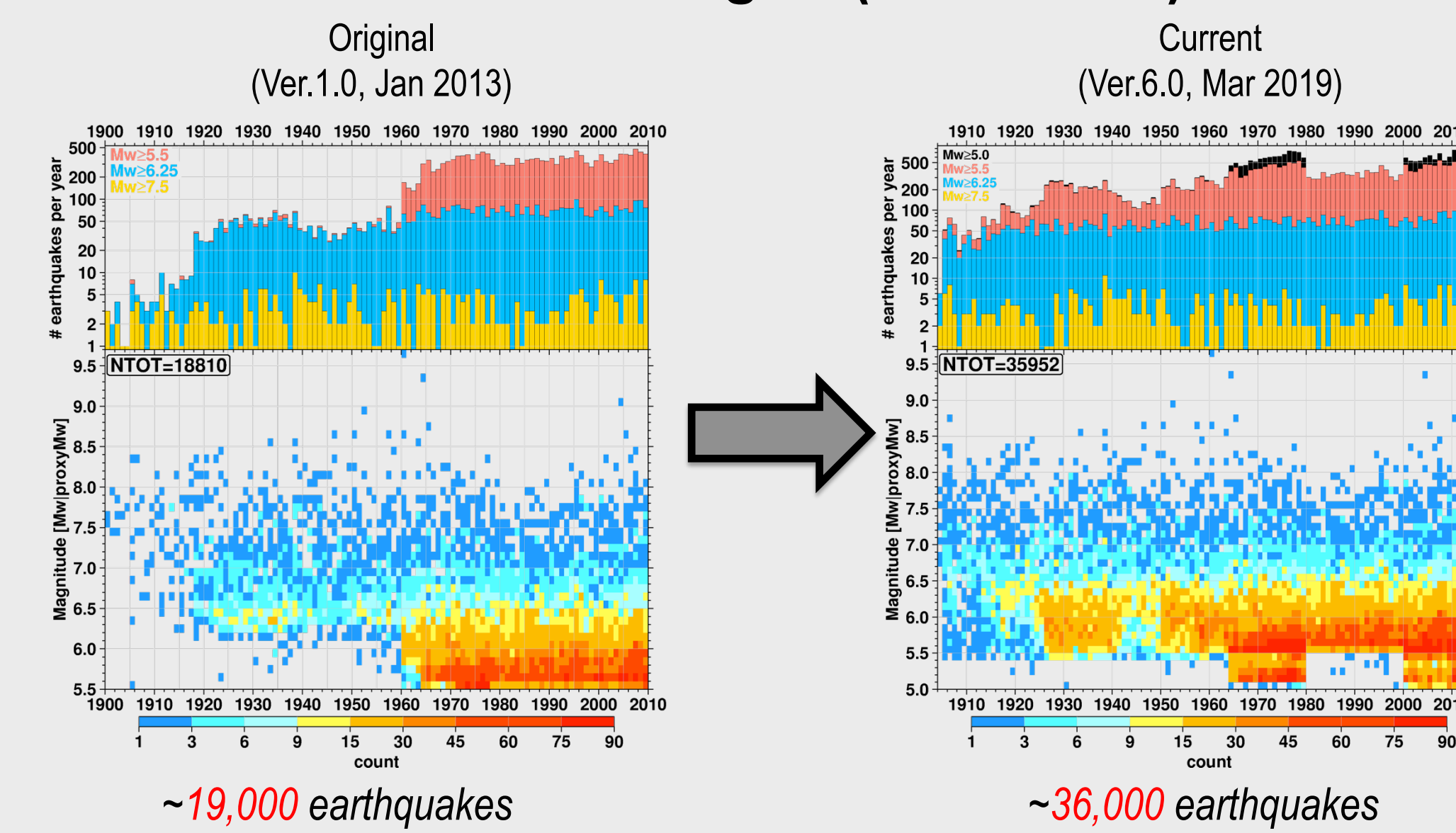
- HASH algorithm (Hardebeck & Shearer 2002)
- FilterPicker source code (Lomax et al, 2012)

Lentas, Geophys.J.Int., 2018

ISC-GEM catalogue (1904-2015)

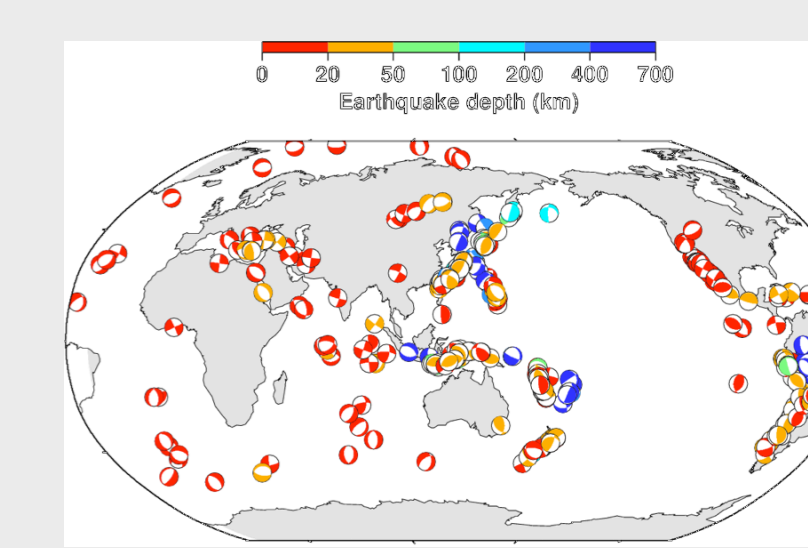
The ISC-GEM Global Instrumental Earthquake Catalogue is originally designed and widely used for modelling seismic hazard on a regional and global scale. The catalogue also has a multidisciplinary use in a wide range of other areas such as studies of global seismicity, tectonics, earthquake hazard forecasting and rapid determination of hazard.

The catalogue contains hypocentre solutions, magnitudes and mechanisms (determined according to the standard set of procedures) for large potentially damaging earthquakes spanning through the entire period of instrumentally recorded seismicity.



The figure is courtesy of BSSA and D. Doser (1990).

Many scientific articles estimate fault plane parameters of historical earthquakes. We concentrated on those before the start of GCMT in 1976. For example, Diane Doser used body waveform inversion techniques to study the source parameters of 4 earthquakes along the southern San Jacinto and Imperial faults: 1937 Buck Ridge, 1940 Imperial Valley, 1942 Borregon Mountain and 1954 Salada Wash events.



In early 2019, we released the latest Version 6 of the catalogue. The most prominent feature is the inclusion of smaller yet potentially damaging earthquakes (M_w 5-5.4) in continental areas; the catalogue has also been extended up to the end of data year 2015.

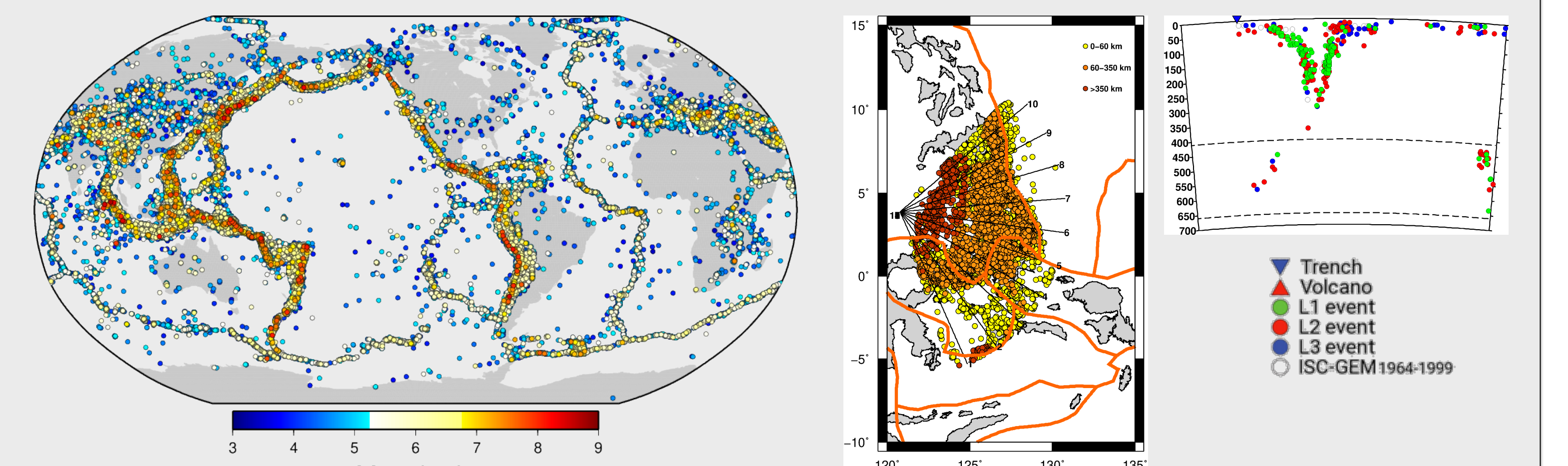
This global map is showing the distribution of the 385 earthquakes where source mechanisms have been added to the ISC-GEM catalogue from the literature. The source mechanisms are colour-coded by depth.

The timeline is colour-coded by source mechanism type: red= moment tensors (MT), blue = broadband analysis (BB); green = first motion polarities (FM); black= unknown (UK).

ISC-EHB bulletin (1964-2016)

The ISC-EHB dataset is a groomed version of the ISC Bulletin. It is a valuable tool for global/regional seismicity and tectonics studies as well as tomographic inversions to reveal the Earth's inner structure. Teleseismically well-constrained events are selected from the ISC Bulletin and are relocated using the EHB location algorithms (Engdahl et al., 1998) to minimise errors in location (particularly depth) due to assumed 3D Earth structure.

The original EHB stopped in 2008, and since then the volume and quality of bulletin data at the ISC has significantly improved. In June 2019 we released a reconstructed ISC-EHB dataset that covers 1964-2016 period. We have used these enlarged and improved ISC Bulletin data, updated the event selection, data preparation and processing, and relocation procedures to produce a cleaner and more robust **ISC-EHB** dataset, using the advantages of both the ISC (Bondar & Storchak, 2011) and EHB location techniques.



170,550 seismic events during 1964-2016

The figures are courtesy of E.R. Engdahl, Ch. Gkaraouni, B. Sakarya and J. Weston

The ISC-EHB bulletin is accompanied with a comprehensive set of maps and cross-sections that are able to reveal complicated tectonic structures in many seismic regions of the Earth.