INTERNATIONAL SEISMOLOGICAL CENTRE (ISC):
CURRENT STATUS & PLANS

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STATUS: MISSION

- Compilation of the definitive summary of the world seismology, the longest continuous and uniform set of bulletin data
- Running the International Seismic Station Registry (with WDC for Seismology, Denver, NEIS)
- Collection of Ground Truth (GT) events (with IASPEI)

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STATUS: ISC DATA COLLECTION

- Thanks to its international and non-governmental status, the ISC is able to collect information from a large number of institutions worldwide.
- The ISC data collection includes important data formats like (ISC), EHB, IASPEI GT, US Army.
- The ISC is the only source of ISC REB for academic institutions.
- The ISC data are free and open to everyone.

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STATUS: INTERNATIONAL SEISMOGRAPHIC STATION REGISTRY (IR)

In conjunction with World Data Center for Seismology (Denver, NEIS), the ISC is responsible for running the International Seismographic Station Registry (IR).

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STATUS: TIMELINES

- The ISC is charged with publishing the most accurate locations of seismic events.
- Since the ISC uses 1D velocity model globally, the ISC event locations are only likely to be superior to those of local networks, when data of several networks are available for the same seismic event are reported to the ISC.

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STATUS: MERGING NETWORK BULLETINS

Progressively larger number of seismic arrays is collected and included into the ISC Bulletin.

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STATUS: PUBLICATIONS

The ISC Bulletin data are available from the ISC website only for registered users. Members of professional groups of users working in different fields.

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STATUS: EHB

The ISC Bulletin data are available from the ISC website only for registered users. Members of professional groups of users working in different fields.

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STATUS: SCIENTIFIC VALUE OF THE ISC

The ISC Bulletin data are used for:
- Compilation and testing of global velocity models
- Seismic tomography
- Seismic hazard assessment
- Seismotectonic studies
- Earthquake prediction studies
- Earthquake rupture process studies
- Nuclear test monitoring
- Testing performance of automatic seismic event picking techniques
- General studies as a tool for initial assessment

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PLANS: COLLECTING FAST REVIEWED EVENT INFORMATION & PROVISIONAL BULLETINS

At present the network operators report final reviewed data within 18 months after real time when ready. Therefore the ISC data collection remains incomplete within this period of time.

- We plan to actively encourage submission of provisional bulletins and fast reviewed event information before the final reviewed data become available for production of the reviewed ISC Bulletin.

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PLANS: MODERNIZING ISC LOCATION PROCEDURES

Currently ISC uses the 10 ak135 model assuming Gaussian, independent errors. To improve ISC location procedures we consider:
- Accounting for correlated model error structure;
- Describing picking errors by non-Gaussian, skewed and heavy-tailed probability distributions;
- Using core phases and further depth-sensitive phases (core and surface reflections);
- Probabilistic phase identification methods;
- Minimizing Lp norm with iterative reweighted least squares or non-linear optimization algorithms;
- Using back azimuth and slowness measurements.

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PLANS: TAKING OWN AUTOMATIC MEASUREMENTS OFF THE WAVEFORMS

Traditionally the ISC has used only parametric data building upon the measurements taken from seismograms by local operators. With the abundance of waveform data available on-line it becomes possible to set up automatic procedures at the ISC for a selected set of stations with the purpose of:
- Taking consistent amplitude measurements to compute an additional set of more reliable ISC magnitudes;
- Picking p-, p', s-, s' and Pp arrivals to constrain the ISC depth estimates where no other means are available;
- Measuring back azimuth and slowness from 3 component stations to assist with event location;
- Creating a detection list of later phases for general use in seismic research.

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SUMMARY

- The ISC remains the source of the definitive comprehensive and most complete summary of worldwide seismology.
- A number of highly important data sets like ISS, EHB, IASPEI GT, US Army are available from the ISC.
- The ISC is the only source of ISC REB for academic researchers.
- The ISC remains a critical source of data for a wide range of geophysical research.
- The ISC continues operating the International Seismographic Station Registry in conjunction with WDC for Seismology.
- We plan to drastically improve the timeliness of the ISC data collection by accepting fast reviewed event solutions and provisional bulletins before the final reviewed bulletins become available.
- We plan to improve the ISC location procedures.
- We plan to start taking specific automatic measurements off the waveforms available on-line to improve parameters in the ISC Bulletin.