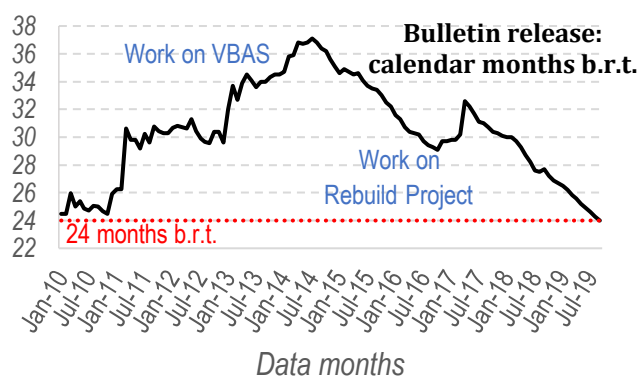


Up and running from our office in Thatcham

## ISC Bulletin is back on track



Traditionally, the ISC Bulletin was released to users ~24 months behind real time (b.r.t.). This delay was maintained to allow all networks around the world (incl. Antarctica) to submit their earthquake analysis results for final analysis at the ISC. Additional delay in the Bulletin availability started creeping up back in data years 2010-2011, when in short succession several large earthquakes with aftershock series occurred: Haiti  $M_w$  7.0, Chile  $M_w$  8.8, Darfield  $M_w$  7.0, Bonin Islands  $M_w$  7.4, Christchurch  $M_w$  6.3 and Tohoku  $M_w$  9.0. The ISC Bulletin analysis system, based on the fanfold paper and bar-code scanners, could no longer cope with the workload causing delays.

In July 2013, based on the KTP funding from UK Government and collaboration with Oxford e-Science Research Centre (OeRC), we started developing the Visual Bulletin Analysis System (VBAS). It was first put into operation in August 2017 for the data month of August 2014. The delay was then at its worst – 37 months b.r.t.

With the great effort by the Analyst Team armed with VBAS and led by Rosemary Hulin first and then Lonn Brown followed by Kathrin Lieser, the delay was gradually reduced with exception to the nine months in 2019, when the

Analyst Team was finishing the 1964-2010 Rebuild project.

Finally, on the last day of September 2021, the data month of September 2019 was released to users, marking the end of a very long effort to catch up with the 24 months b.r.t. goal. Notably, this happened during the covid pandemic period when VBAS showed its second advantage, enabling remote working. The NSF covid emergency grant also proved useful to provide extra analyst time to compensate for the slower rate of remote work.

At this point, having taken into account rather sluggish data collection from many reporters affected by covid, we have decided to stay at 24 b.r.t. until such time as the original data become available sooner from all reporters.

## Old station bulletins on the web

Over the years, many old printed station bulletins from the ISC warehouse and several donated collections have been scanned, either

by INGV's SISMOS project or at the ISC.



It took our summer student, Adrian Armstrong and his supervisor, Domenico Di Giacomo only a few weeks to put the entire collection of

historical bulletin scans on the web ready to be used by the community. The service is interactive and allows users to see the map of all places where bulletins were produced as well as the timeline of their availability.

We aim to engage with our users who are able to fill the gaps in this collection with scans of bulletins available at their institutions.

## Back in the office

Based on the success of the UK vaccination programme, the ISC staff returned to working in the office on 19<sup>th</sup> July.

### Adrian Armstrong hired

At first, Adrian was given a temporary job straight after he defended his university



research project. His effort on the printed station bulletins, described above, was highly appreciated. He was also found

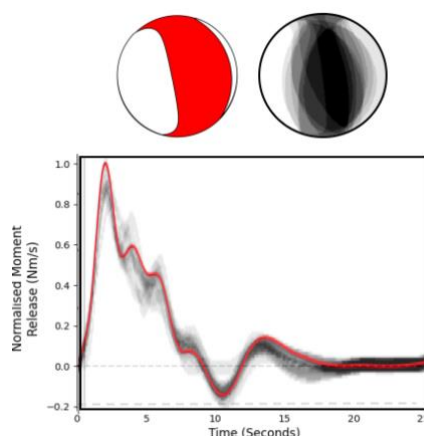
quite capable of cleaning the barbeque set after the post-covid "back to the office" garden party at the ISC. Thus, a full-time job was offered to him at the end of his temporary contract to work on the 2nd version of VBAS, written in Java, implementing the suggestions collected by the Analysts since 2017.

Adrian lives locally. He was taught at Kennet School, just a few hundred metres away from the ISC. He studied Computer Science with a focus on Artificial Intelligence, completing a B.Sc. at the University of Hertfordshire. In his spare time, Adrian enjoys playing basketball and table tennis.

### ISC-PPSM in 2019 Bulletin

The first year of ISC-PPSM solutions are now available as a preliminary (beta) data set through the ISC Bulletin search pages. 'PPSM' stands for **p**robabilistic **p**oints **s**ource **m**odel. This set of earthquake moment tensors, source time functions and depths characterises the uncertainty in the earthquake point source that is apparent from the range of moment tensor

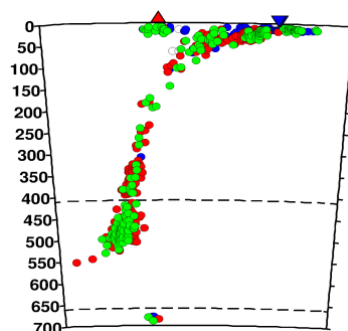
solutions reported to the ISC by various agencies. By solving the earthquake STF and depth, we add new constraints on the depth of shallow remote moderate magnitude ( $M_w$  5.5–7.2) earthquakes. This information has also been used in the routine ISC Bulletin analysis to fix the depths of ~20 earthquakes. Overall, there are 186 ISC-PPSM solutions for the period of Jan-Nov 2019, ~17 events per month on average. In this project, Tom Garth, the proprietor of the ISC-PPSM dataset, has greatly benefitted from collaboration with Prof. Karin Sigloch (University of Oxford at the time).



*ISC-PPSM solution for the  $M_w$  5.6 earthquake that occurred on Jan 7, 2019 in the Mindanao region*

### ISC-EHB extended to 2018

The ISC-EHB dataset has been extended with 7,880 earthquakes and 2,541,130 seismic



phases. It now covers teleseismically well constrained events from 1964 to 2018. Maps and cross-sections of major subduction zones have also been

updated (*on the figure: Izu-Bonin*). The depth phases picked at the ISC helped to enhance the depth resolution of every 10<sup>th</sup> earthquake in the ISC-EHB dataset, which is currently maintained by Bob Engdahl and Burak Sakarya.



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