**Virtual RISE/CSEP Tutorial:**

**Testing earthquake forecasts with the pyCSEP software toolkit**

Version 1: 16 February 2021

Version 2: 22 February 2021

Dear RISE Earthquake Forecast Modellers,

The Collaboratory for the Study of Earthquake Predictability (CSEP) and Work Package 7 of the RISE project cordially invite you to a virtual tutorial about testing earthquake forecasts with the pyCSEP software toolkit:

**Date:** 23 March 2021

**Time:** 17.00CET (16.00GMT; 8.00PST)

**Duration:** approximately 2 hours

**Zoom:** https://zoom.us/my/csepmeetings

**Registration: xxx**

**Instructors:** Bill Savran (USC), Kirsty Bayliss (Edinburgh), Toño Bayona (Bristol) & Pablo Iturrieta (GFZ), Max Werner (Bristol)

**Pre-requisites:** 1. Attendance at the pyCSEP overview webinar on 9 March 2021

2. Pre-installation of pyCSEP (see guide & drop-in clinic below)

**Optional:** Bring your own probabilistic long-term forecast

The goal of the tutorial is to enable modellers to perform simple operations to evaluate their forecasts using the pyCSEP toolkit. This includes downloading and plotting earthquake catalogue data, filtering a catalogue to testing regions, learning about CSEP standards and formats, plotting forecasts, and performing standard CSEP forecast consistency and comparison tests.

PyCSEP is an open-source community-developed python library that provides tools for (1) evaluating probabilistic earthquake forecasts, (2) working with earthquake catalogues in this context, and (3) creating visualisations.

**Agenda (to be finalised)**

17.00 – 17.05 Welcome & Introductions (Danijel Schorlemmer & Max Werner)

17.05 – 17.15 Summary of pyCSEP & goals of the tutorial (Bill Savran)

17.15 – 17.35 Guided Tutorial (2 streams??):

follow provided examples (either gridded or simulated cats)

17.35 – 17.45 Q&A / break

17.45 – 18.45 Independent Tutorial:

Complete these independent tasks (different period tests, different forecasts, different regions??)

18.45 – 18.55 Discussion, Q&A and Feedback

18.55 – 19.00 Next steps (hints for your own experiments; contributing sw development)

**Pre-workshop Installation Trouble Shoot Clinic**

Please install Python and pyCSEP *prior* to the tutorial by following the installation guide. If you encounter problems, you may either submit an issue on git, or you can drop by during an installation troubleshooting clinic:

Date: 18 March 2021

Time: 17.00 – 19.00CET

Zoom: https://zoom.us/my/csepmeetings

**Learning outcomes:**

At the end of this workshop, participants will be able to conduct basic software operations useful for forecast model testing, including:

* Download or import earthquake catalogue data from an authorised, supported data source
* Visualise an earthquake catalogue
* Filter an earthquake catalogue to specific testing regions and magnitude thresholds
* Explain CSEP formats for catalogues and forecasts
* Plot a spatial (gridded) earthquake forecast
* Evaluate a gridded earthquake forecast with earthquake catalogue data by applying a number of different consistency tests
* Compared the informativeness of two or more gridded earthquake forecasts with each other.
* Visualise/plot the test results.