

# Meet the GIESA's: direct shear devices at MARUM



European Research Council  
Established by the European Commission

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Photo of GIESA 3

## Who are they?

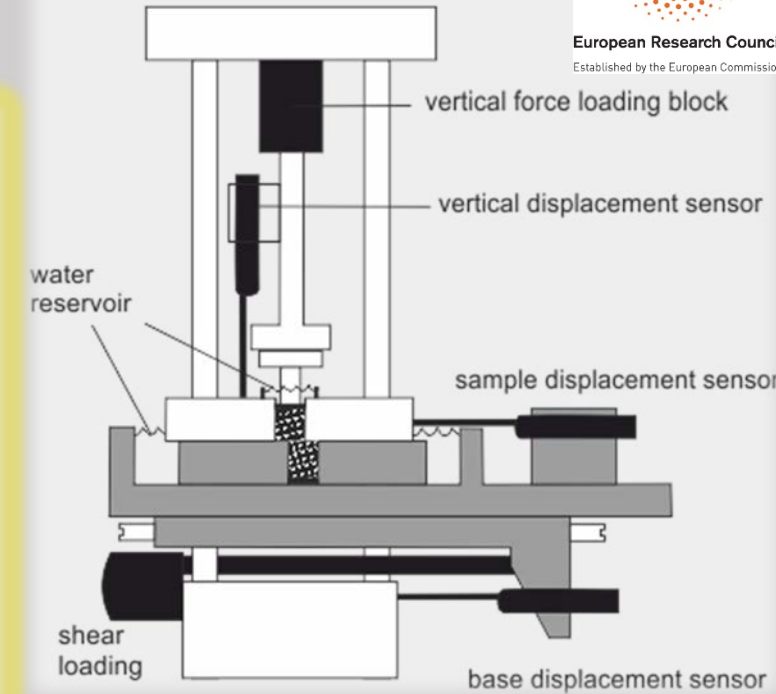
Please allow me to introduce our direct shear devices to you. We call them Giesea 1, 2 and 3, named after the company who made them. You can find them in our lab on the second floor of MARUM I.

## What do they do?

The schematic drawing on the right shows the moving parts in gray. This whole part moves to the right, deforming the sample in the middle (dotted part). The cylindrical sample, which consists of solid rock or rock powder, is 'sheared'. This means it is broken and forced to slide past each other. At the same time, we push down on the sample with a force of maximum 19 MPa (weight of 300 elephants on a square meter). All this time, we measure the movement of the sample and the forces on the sample.

## ... and what is the use of that?

We use this to simulate movements on real faults inside the earth. The continuous movements of the earth's tectonic plates put shear forces on faults, which results in earthquakes and related phenomena. With these machines we mimic this behaviour in a controlled way, so that we can study what happens inside the rock.



Schematic drawing of GIESA devices



Photo of sample and bottom sample cell