# *Pacific Array* update 2020

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With a simple crustal structure and short geological history, ocean basins provide an unblemished view into mantle dynamics, including convective flow and melting processes that control deformation and evolution of Earth’ s surface. With the full spectrum of plate-boundary processes and abundant mid-plate volcanism sourced deep in the mantle, the Pacific basin provides an outstanding setting to explore connections between shallow dynamics and the deep interior. Exploiting advances in seafloor instrumentation, research groups in Japan, the US, and elsewhere have demonstrated the utility of broadband ocean-bottom seismic and EM arrays for providing new, high-resolution constraints on mantle structure and dynamics. These activities have coalesced into the international collaboration Pacific Array, which seeks to merge individual efforts into a large-scale "array of arrays" that will effectively cover the entire Pacific basin diachronously over a decadal time scale.

Between 2018-2019, this initiative moves forward with three new arrays. The first 30-station seismic array (young-ORCA) was deployed April 2018 –May 2019 on 40-Ma seafloor northeast of the Marquesas Islands by the US team, which was followed by another one (old-ORCA) for Nov 2019 –Dec 2020 on 110-Ma seafloor southwest of Tahiti. Data from both arrays will be openly available upon recovery. The second 12-seismic and 8-EM array was deployed in Oct-Nov, 2018 –Nov, 2019 as a collaboration between Japan and South Korea on the oldest seafloor in the western Pacific (Oldest1). Also two new arrays (at around the Galapagos Islands and the old $H_2O$ seafloor observatory) have been funded by NSF. Further a second array on the oldest seafloor (Oldest2) at east of Oldest1 has been proposed as a collaboration between Japan and Taiwan. These new arrays are planned to be deployed in early 2021. We summarize these experiments possibly with early results, and describe goals, news and plans for expanding Pacific Array through broader participation of the international seismology and geodynamics community. Updated information can be found at http://eri-ndc.eri.u-tokyo.ac.jp/PacificArray/ .

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