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# Three depositional states and sedimentary processes of the western Taiwan foreland basin system

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The western Taiwan foreland basin formed during the Early Pliocene as the flexural response to the loading of Taiwan orogen on the Eurasian plate. What makes Taiwan interesting is the oblique collision, which allows the foreland basin to be seen at different stages in its evolution at the present day. Due to oblique arc-continent collision from north to south, the western Taiwan foreland basin has evolved into three distinct subbasins: an over-filled basin proximal to the Taiwan orogen, mainly distributed in the Western Foothills and Coastal Plain provinces, a filled basin occupying the shallow Taiwan Strait continental shelf west of the Taiwan orogen and an under-filled basin distal to the Taiwan orogen in the deep marine Kaoping Slope offshore southwest Taiwan, respectively. The over-filled depositional phase is dominated by fluvial environments across the structurally controlled piggy-back basins. The filled depositional state in the Taiwan Strait is characterized by shallow marine environments and is filled by Pliocene-Quaternary sediments up to 4,000 m thick derived from the Taiwan orogen with an asymmetrical and wedge-shaped cross section. The under-filled depositional state is characteristic of deep marine environments in the wedge-top basins accompanied by active structures of thrust faults and mud diapers.
Sediments derived from the Taiwan orogen have progressively filled the western Taiwan foreland basin across and along the orogen. Sediment dispersal model suggests that orogenic sediments derived from oblique dischronous collisional highlands are transported in two different ways. Transport of fluvial and shallow marine sediments is perpendicular to hill-slope and across-strike in the fluvial and shallow marine environments proximal to the orogen. Fine-grained sediments mainly longitudinally transported into the deep marine environments distal to the orogen.
The present sedimentary processes in the over-filled basin on land are dominated by fluvial processes of small mountainous rivers. Tidal currents are prevalent in the filled basin in Taiwan Strait, transporting shelf sands and forming sand ridges. The deep marine under-filled basin are dominated by down-slope mass wasting processes, eroding slope strata and transporting sediments to the basin floor. In addition, many submarine canyons on the continental slope offshore southwest Taiwan serve as major sediment pathways, delivering shallow marine sediments to the basin floor.