

Numerical Modeling Investigation of Fluid Flow above and below Sediment-Water Interfaces

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PURPOSE OF STUDY

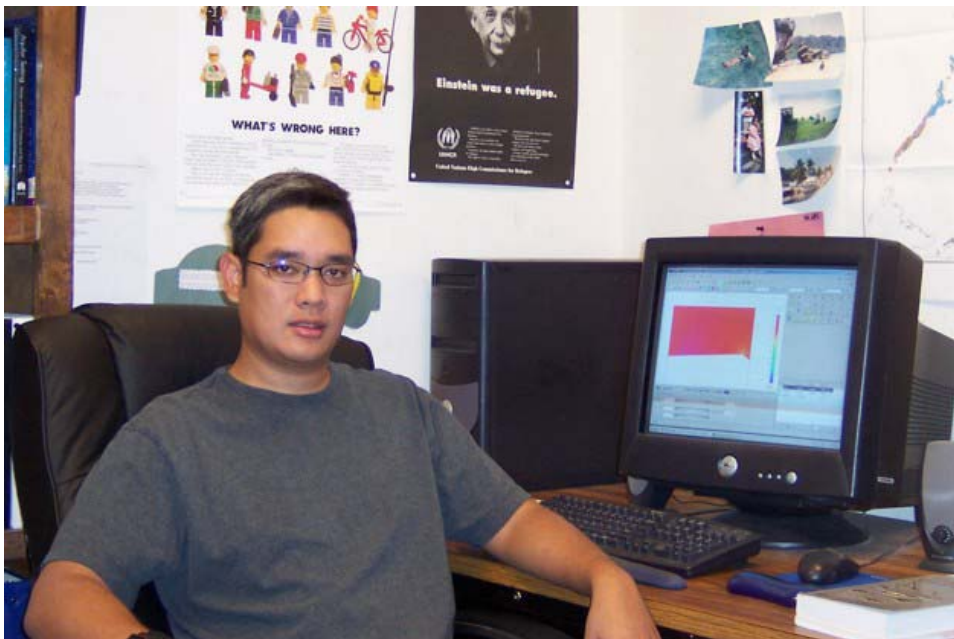
Hydrodynamical processes in sediment-water interfaces indirectly regulate the distribution of ecologically and environmentally significant solutes and organisms; however, little is known about these processes. Pressure gradients along irregular bed surfaces, created by fluid motion in an overlying water column, cause fluid flow into and out of porous sediment beds. This research will provide further knowledge of the hydrodynamics of flowing water columns overlying porous sediments.

STUDY UNDERWAY

- Preliminary research has outlined the relationships and interactions between the area of volumes within the sediment bed influenced by the overlying water column, the water column hydrodynamic conditions, changes across the sediment-water interface, and bedform geometry.
- The researchers plan to extend their findings to more complex and realistic scenarios, namely turbulent flow conditions, and may also explore three-dimensional simulations.

BENEFITS

- The computer simulations conducted have explained underlying fluid physics that are difficult to observe in the field or to simulate in physical laboratory models.
- This research will open up further opportunities to fully understand the hydrodynamical processes occurring in interfacial areas.



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