# Better physics for coastal dynamics

## Sediment transport

## And what about carbonate sands ???

### For calcareous sand from this study

$$C_D = (\frac{a_3 \nu}{d_n^{1.5}\sqrt{g}} + a_4)^{a_5} + (\frac{a_6 \nu}{d_n^{1.5}\sqrt{g}} + a_7)^{a_8}$$

$$\omega^2 = \alpha \frac{4}{3}\frac{(S-1)g}{C_D} S_f^{2/3} d_n$$

with

- $\alpha = 0.55$
- $a_3 = 9.5$
- $a_4 = 0.76$
- $a_5 = 2.92$
- $a_6 = 20.47$
- $a_7 = 1.02$
- $a_8 = -48.15$

The following values have been chosen for the different parameters:

- water density $\rho_w = 1024 kg.m^{-3}$
- sediment density $\rho_s = 2600 kg.m^{-3}$
- dynamic viscosity $\mu = 1.002e^{-3}$ in Pa.s at 20 C
- kinematic viscosity $\nu = \mu/\rho_w$
- $S_f = 0.556$

### For siliciclastic sand

$$C_D = (\frac{a_1 \nu}{d_n^{1.5}\sqrt{g}} + a_2)^{a_3}$$

$$\omega^2 = \frac{4}{3}\frac{(S-1)g}{C_D} S_f^{2/3} d_n$$

with

- $a_1 = 96.45 - 74.74 S_f^{-0.113}$
- $a_2 = 1.129 - 0.435 S_f^{1.7}$
- $a_3 = 2.023$

values:

- water density $\rho_w = 1024 kg.m^{-3}$
- sediment density $\rho_s = 2600 kg.m^{-3}$
- dynamic viscosity $\mu = 1.002e^{-3}$ in Pa.s at 20 C
- kinematic viscosity $\nu = \mu/\rho_w$
- $S_f = 0.556$

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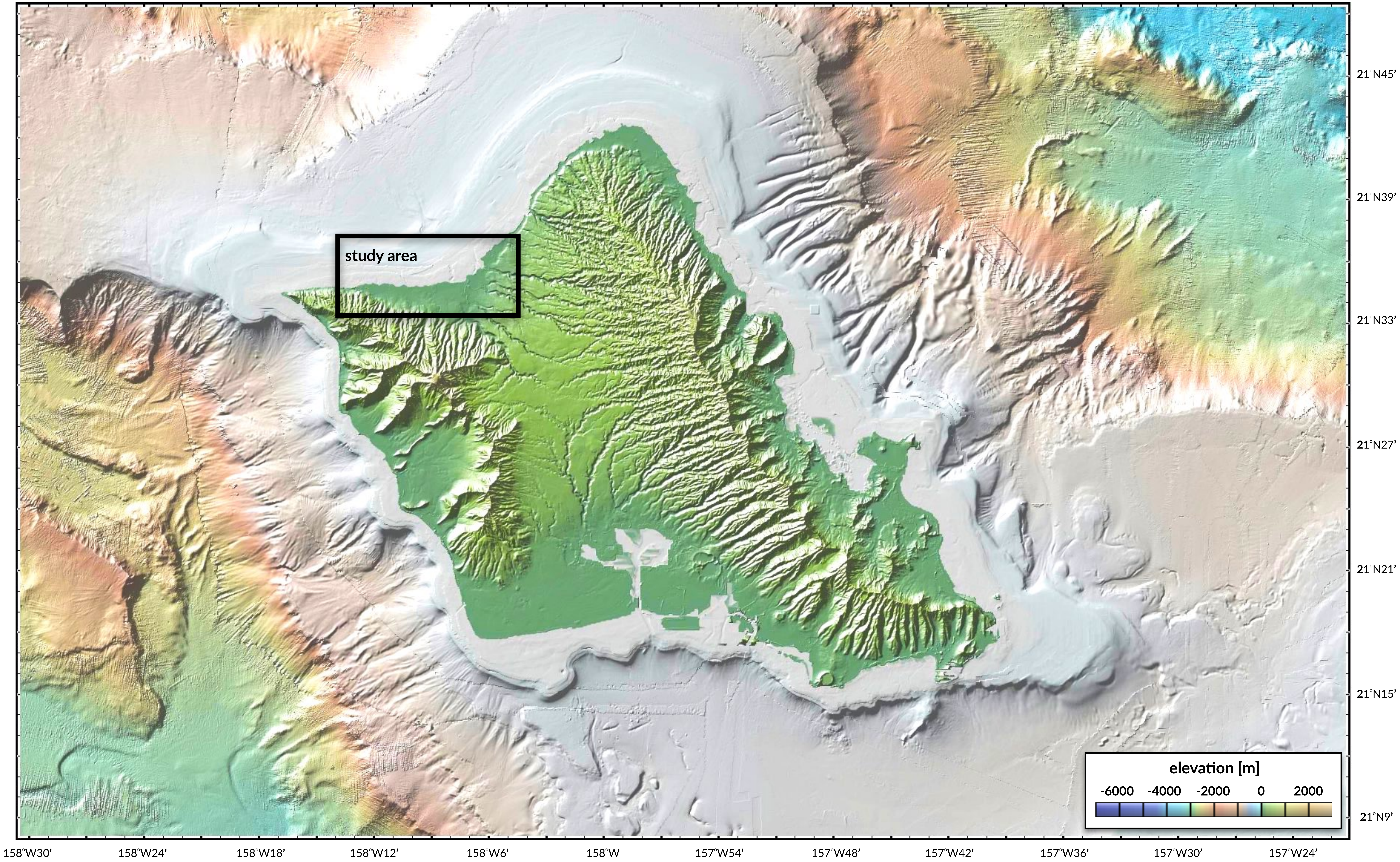
**Sediment transport** using open-source dataset

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