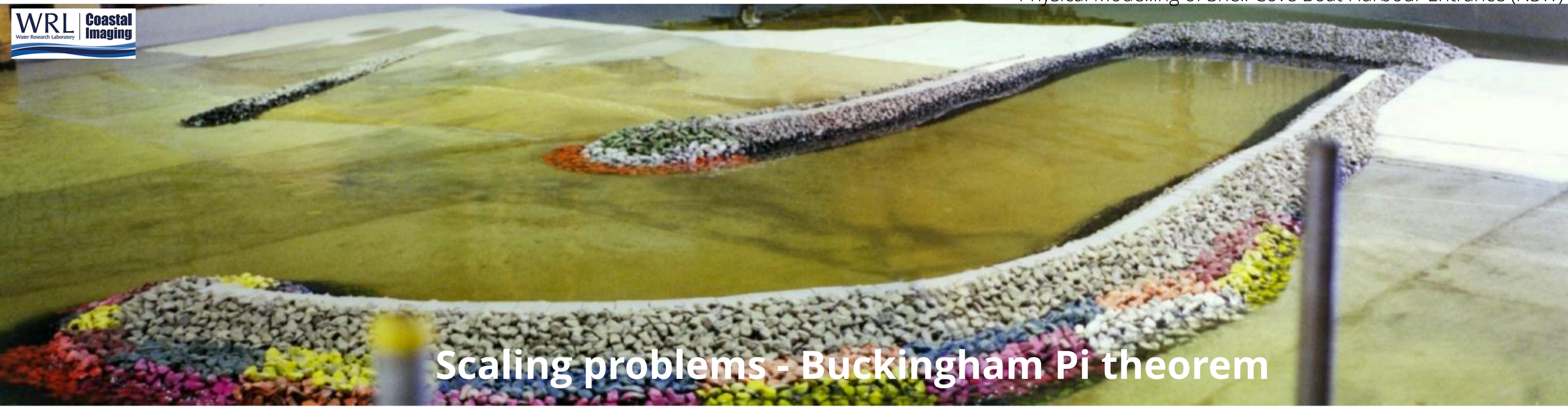
Physical modelling: laboratory models

Physical Modelling of Shell Cove Boat Harbour Entrance (NSW)



- Euler number: stream pressure versus inertia forces

$$\pi_3 = V^{-2}\, L^{-2}\, F^{1}\ \rho^{-1}\ \mu^{0}\, g^{0} = F\ /\ \rho\,(VL)^2 = Eu$$

- Other dimensionless numbers used in fluid flow physics:

Weber number — Cauchy number — Mach number — Strouhal number

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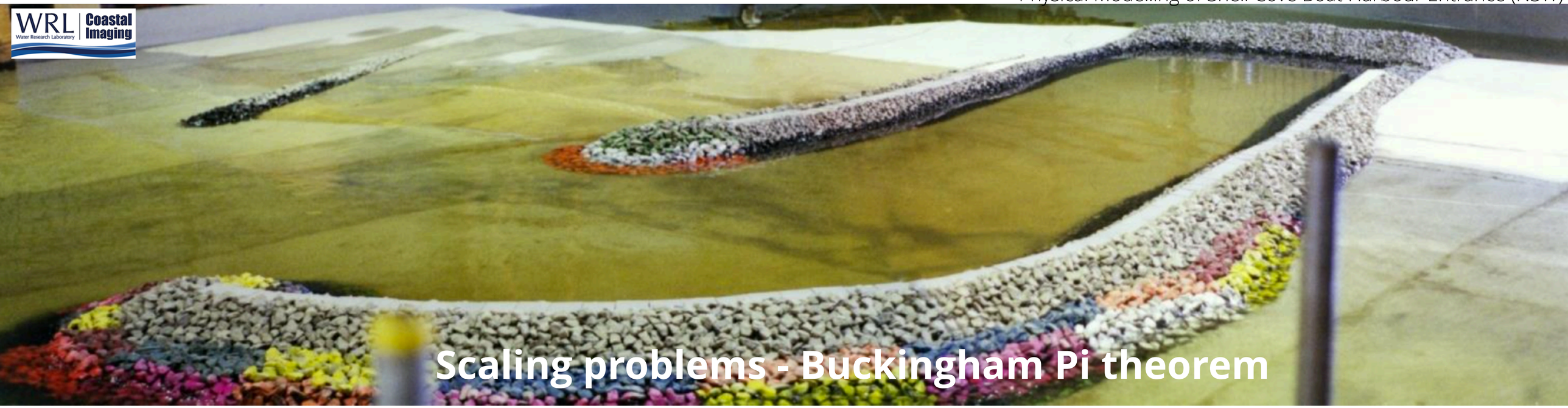

Forming dimensionless numbers from selected variables is somewhat arbitrary it is usually the result of physical reasoning and observations!

- Fall speed parameter: $H/\omega T$ where ω is the angular frequency
- Breaker index: Hb/h
- Ursell number: $L^2 H/h^3$ (linear/Airy wave theory)