Experimental design: similarity

Dynamic similarity:
Geometric similarity & similarity of forces

Ratios between different forces in full scale must be the same in model scale.

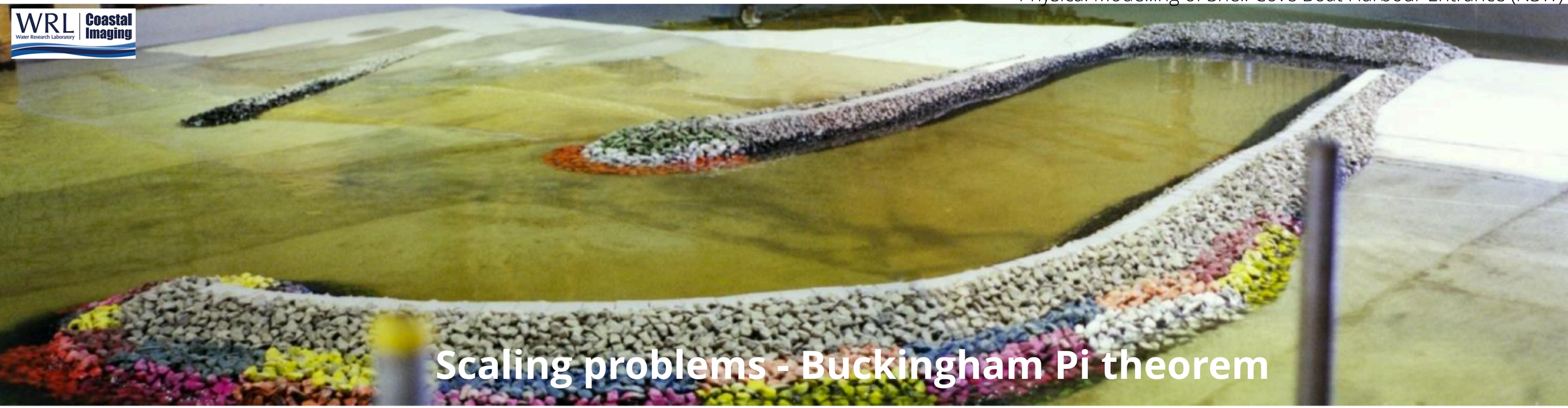
If you have geometric and dynamic similarity, you'll also have kinematic similarity.

The following force contributions are of importance:

- Inertia Forces, Fi
- Viscous forces, Fv
- Gravitational forces, Fg
- Pressure forces, Fp
- Elastic forces in the fluid (compressibility), Fe.
- Surface forces, Fs.

Physical modelling: laboratory models

Physical Modelling of Shell Cove Boat Harbour Entrance (NSW)



- The theorem states that if there is a physically meaningful equation involving a certain number **n** of physical variables with ***k*** the number of physical dimensions involved, then the original equation can be rewritten in terms of a set of $p = n - k$ dimensionless parameters π_1, π_2, ..., π_p constructed from the original variables.
- The theorem provides a method for computing sets of dimensionless parameters from the given variables