

FLUME BASED OBSERVATIONS OF MARSH DYNAMICS

AIM: determine response of saltmarsh to hydrodynamic forcing.

PLUS: assessments of complex feedback mechanisms between sediment, marsh vegetation, benthic invertebrates, and flow structure.

EXPERIMENTAL DESIGN:

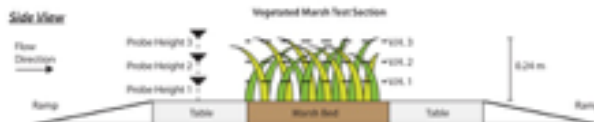
Intact sections of salt marsh from distinct tidal elevations on two field sites will be collected and undergo one of three treatments:

- 1) Placed into the recirculating flume at Cambridge University, to undergo a series of experiments to assess bed stability, marsh and sediment dynamics.
- 2) Taken to Southampton to undergo climate change scenario (CO_2 , temp), prior to flume experiments.
- 3) Taken to Southampton and maintained under ambient conditions (control), prior to flume experiments

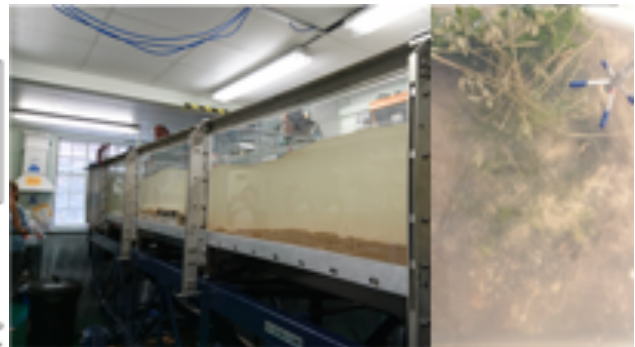
Aerial View



Side View



Schematic courtesy of James Tempest



KEY MEASUREMENTS:

The following parameters will be measured during or alongside the flume experiments:

- Flow **velocity** in 3 dimensions (u, v, w)
- **Turbulence** (u', v', w')
- **Bed level** change (dz/dt)
- **Suspended sediment** concentration (SSC)
- **Sediment** properties
(biomass, grain size, organic content)
- **Plant** properties
(biomass, height, density, bed)

This allows us to determine:

- Boundary layer structure, roughness, drag and flow damping/enhancement
- Threshold of erosion
- Erosion rates and dynamics
- Vegetation behaviour

