Cold-water coral feeding rates

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Introduction

- **Functional responses**, i.e. feeding rates as function of food concentration, determine growth and the links in food webs.
- The functional responses of cold-water coral may be modified by **environmental factors** such as water flow velocity, sediment concentration and food particle size.
- Therefore, we combine data and theory to ultimately arrive at a functional response dependent on such environmental factors.

Methods

- We analyze data from **several experiments** all conducted in identical flumes (Fig. 1).
- In each experimental run, a known amount of food (*Artemia salina* larvae) is added to a know amount of coral (*Lophelia pertusa, Madrepora oculata* or zoanthellae containing *Balanophyllia europaea*) and the **decline of food concentration over time** is recorded.
- Experimental runs differ in water flow velocity, sediment concentration, food particle size, light regime, initial food concentratn and duration of experimental run.
- For each experimental run, we determine the clearance rate, i.e. the volume cleared of food per hour per polyp.

**Functional response: central assumption**

- Coral and food meet at a rate proportional to each of their densities.
- The constant of proportionality is the **clearance rate**.

Conclusion

- Estimating clearance rates normalizes for the effect of food concentration on feeding rates.
- Clearance rates appear to depend on flow velocity and food particle size.

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