Resource-consumer relationship along a gradient of water flow

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Goals

- Determine how changes in water flow affect the nutritional quality of the Everglades periphyton (e.g. Fig. 1).
- Determine whether changes in the nutritional quality of the Everglades periphyton affects consumers stoichiometry and fatty acids composition (see Fig. 2).

Figure 1. Periphyton is the dominant form of primary production in the Everglades.

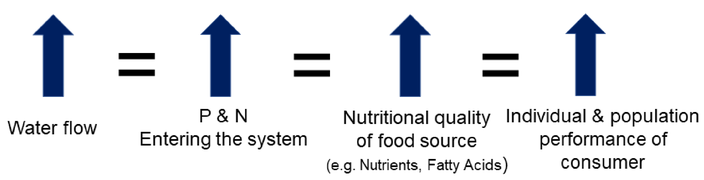

Figure 2. Expected outcomes of increased water flow in the Florida Everglades.

Research Methodology

- We created a food-web fragment within enclosures established at three locations experimentally differing in water velocity (0 cm/s, 3-4 cm/s, 5-7 cm/s).
- The food web consisted of primary producers (periphyton mats and biofilm), a snail grazer (*Planorbis rubrum*), an omnivorous fish (*Gambusia holbrooki*), and a carnivorous fish (*Enneacanthus gloriosus*) (Fig. 3).
- The resource-consumer relationship across locations was evaluated using nutrient and fatty acid profiles, tools that relate the dietary sources of energy from basal resources to consumers.

Figure 3. Fragment of the Everglades food web.

Results

- P concentrations in the producers increased with water velocities (Fig. 4).
- P concentrations in consumers do not reflect the pattern observed in the producers (Fig. 4).

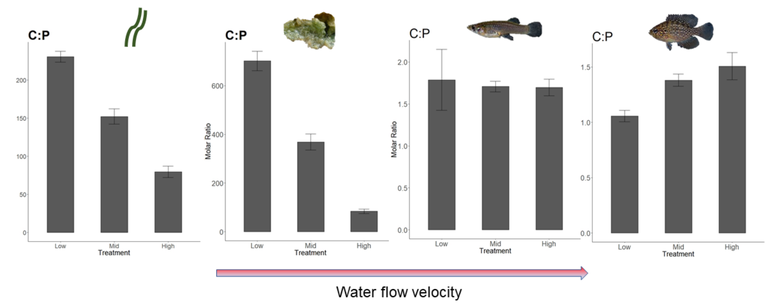

Figure 4. Effect of water flow in the molar ratio of the components of the food web.

- In all of the components of the food web, the % of essential FA varied across flow treatments (Fig. 5).

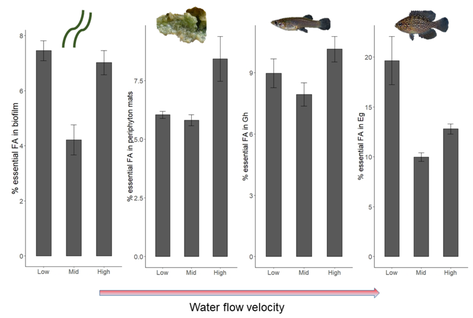

Figure 5. Proportion of essential FA in the components of the food web across the gradient of water flow.

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