

**Figure S1.** Representative Lagrangian transect showing trends in (a) total alkalinity ( $A_T$ ) and (b) dissolved inorganic carbon ( $C_T$ ) in seawater as it traverses the Davies Reef flat. The transect shown here was conducted on January 17, 2012 from 10:39-11:43. Duplicate water samples are indicated at each sampling point.

**Figure S2.** Relationship between drifter and dye speeds as a function of wind speed.