

Figure S1. Analysis of the narrow channel on Molar Reef's northwest side. (a) Velocity field derived from PIV analysis of an image pair (looks 6 and 7) having a time separation of $\Delta t = t_2 - t_1 = 11.6$ s (see Table 1 in main text). The underlying image is "red-edge" data at time t_1 . (b) Velocity magnitude, using the same scaling as in Figure 5. (c) A 600 m x 600 m subset area from within the red square in (a). (d) Subset of t_2 image within the same geographical red square. Red scale bar in (c) and (d) is 50 m long, which is the approximate distance features move between the two images; the corresponding surface velocity would be 4.3 m/s.

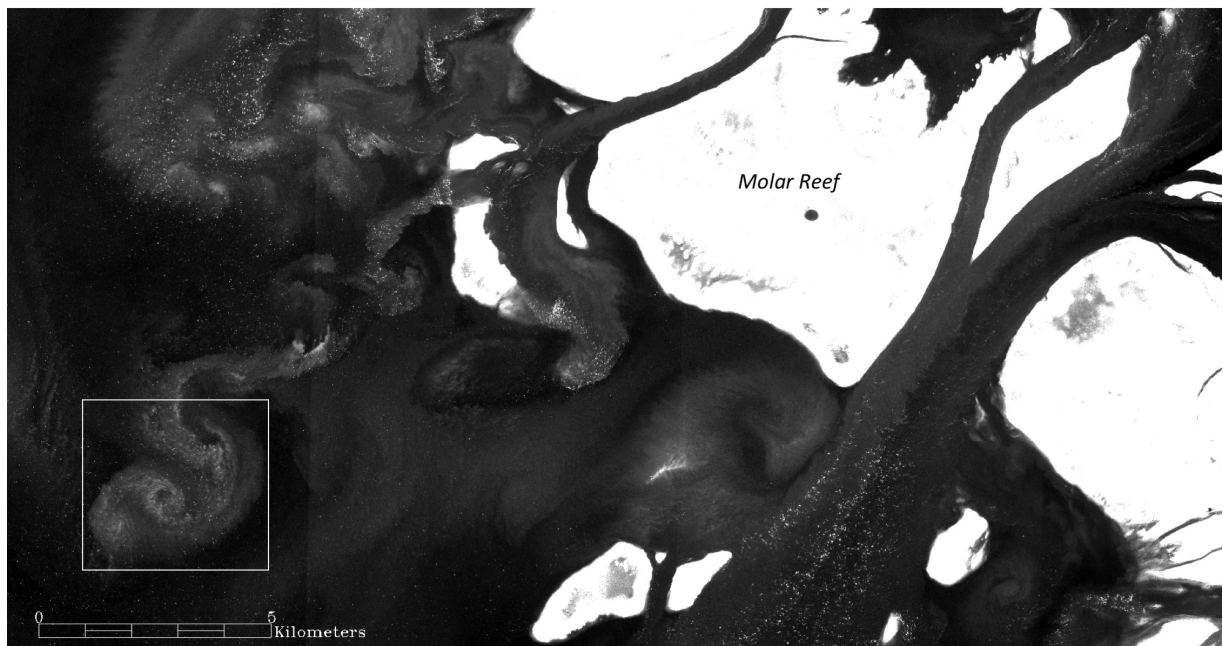


Figure S2. Location of dipolar vortices relative to Molar Reef. Shown is band 3 data from 23:37:53 UTC on August 22, 2020. Area within the white rectangle is examined in Figure S3.

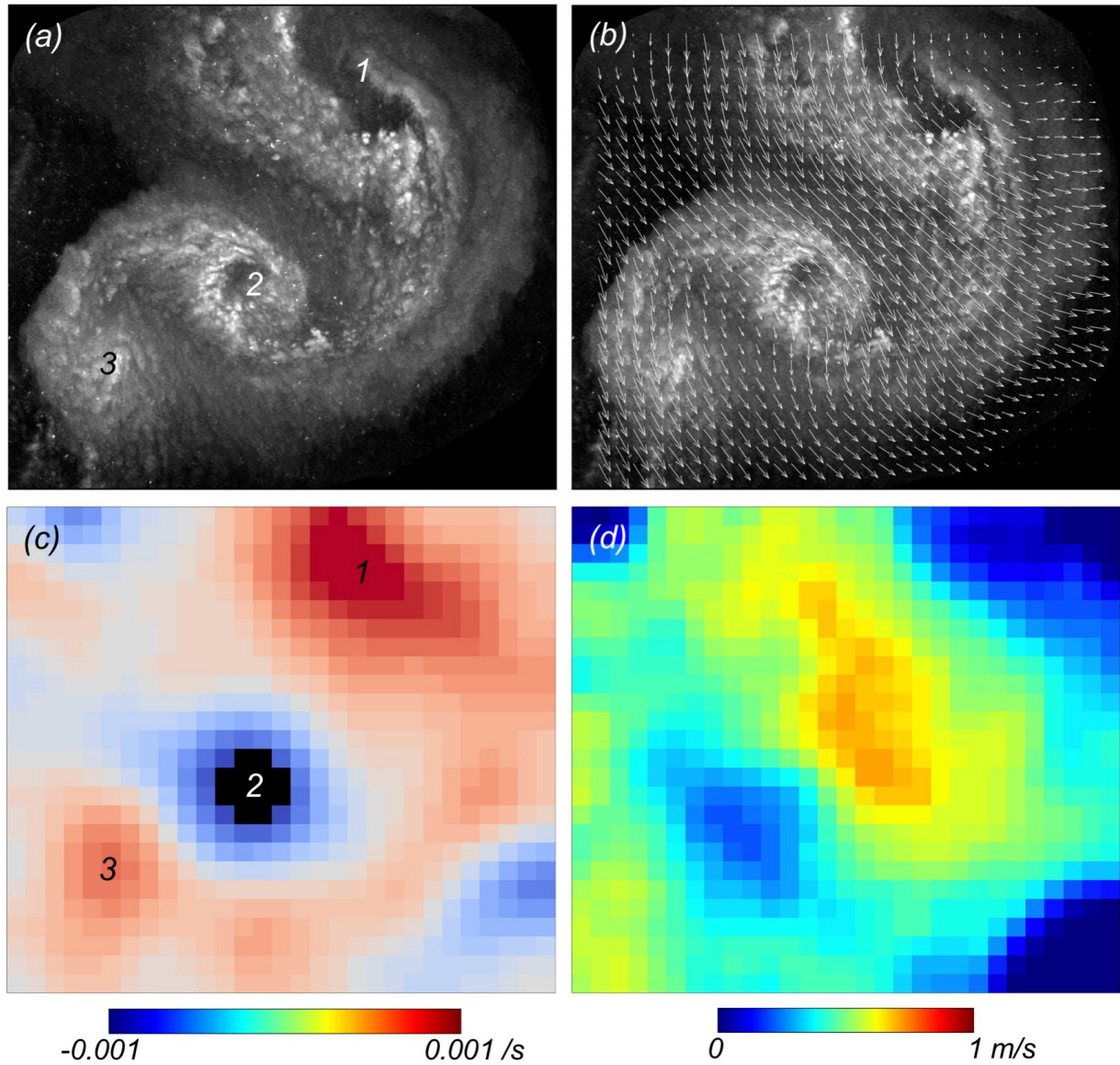


Figure S3. PIV analysis of the dipolar vortices highlighted in Figure S2, using looks 3 and 7 from August 22, 2020. The time separation between these two looks is $\Delta t = t_2 - t_1 = 49.8$ s. (Refer to Table 1 in main text). (a) Band 3 image for look 7. (b) Velocity vectors overlain on image; longest vector is 0.71 m/s. (c) Vertical vorticity. (d) Velocity magnitude. The extent of each panel is 4 km \times 3.6 km. Prior to analysis, a median filter was applied to the image data to lessen the impact of isolated returns from breaking waves; also, featureless areas in three corners of the image (upper left and right; lower right) were masked to reduce the occurrence of spurious vectors. Three vorticity cores (features 1 to 3) are identified in panel (c); these positions were then copied to panel (a). Note that the strongest flow appears to lie along the stem, or centerline, of a southeastward-directed dipole (features 1-2), while relatively weak flow lies along the stem of a northwestward-directed dipole (features 2-3), the two dipoles sharing a common, central vorticity center (feature 2).