Near-real time surface velocities in the SPURS-2 region

SCUD (Surface CUrrents from Diagnostic model) uses near-real time satellite sea level and wind to diagnose velocities, consistent with motion of standard GDP drifters, drogued at 15-m depth.

SCUD velocities are daily on a ¼-degree grid and conceptually are a superposition of geostrophic and Ekman currents. SCUD is a model of the same class as OSCAR but has different definition of 'currents'. SCUD provides an excellent tool for planning drifter deployments.

Limitations include:

- Inertial oscillations that have at 10N periods close to three days and may reach tens of cm/s in strength are not included in the SCUD. SCUD velocities should be used not for an instantaneous comparison but for 3-7 days projections.
- Submesoscale features may be under-resolved by sparse altimeter tracks.
- Other "Lagrangian" devices (Argo floats, mixed layer drifters, undrogued drifters, etc.) will move differently from 15-m drifters. The differences are due to vertical velocity shear and direct wind effect.

Small-size netcdf files and gif images are located on a public ftp site

ftp://climate.soest.hawaii.edu/users/hafner/DATA/SCUD/

Sub-folders include:

2016: SCUD daily data (netcdf)

Daily: gif-maps of daily SCUD velocity vectors in 5-15N, 135-115W (Fig.1).

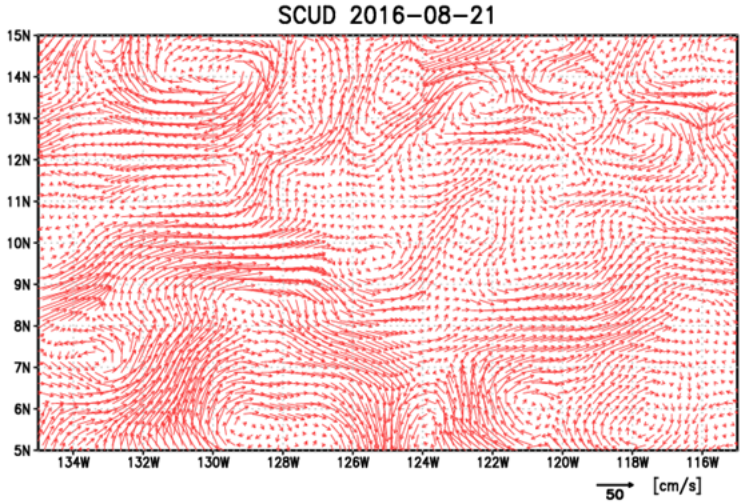

Figure 1. Example of SCUD velocities on August 21, 2016.

Weekly: gif-maps of streamlines of week-averaged velocities are best to understand the larger (0-25N, 16-80W) pattern of currents (NEC, NECC, TIW, TIV, etc.) (Fig.2)

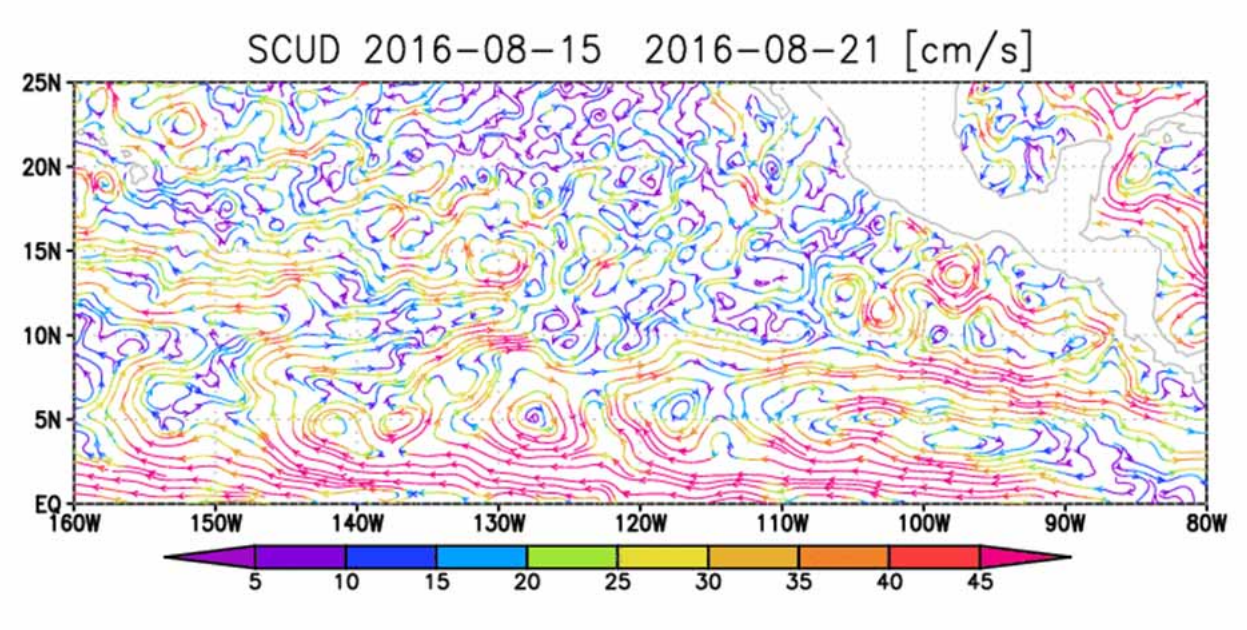

Figure 2. Example of near-surface streamlines averaged over the week of Aug 15-21, 2016.

These data and maps will be updated daily for the duration of the R/V Revelle cruise.

Full-size SCUD streamline maps (DAILY, WEEKLY) **and validation** against drifters are available on the Google Drive: https://drive.google.com/open?id=0B0vRDYR_SzimREtsaERTaHVnRU0

Validation includes comparison of real week-long drifter trajectories with SCUD model particle trajectories (folder: Weekly_Lagrangian_trajectories, Fig. 3) and Lagrangian velocity vectors, averaged over one week (folder: Weekly_Lagrangian_velocities, Fig. 4).

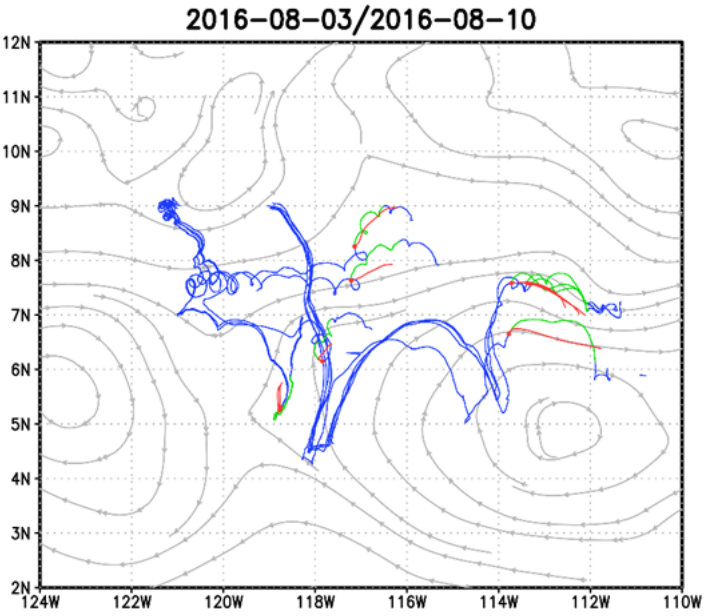

Figure 3. Example of comparison between August 3-10, 2016 segments of SPURS drifter trajectories (green) and SPURS particle trajectories (red). Black are SCUD streamlines, averaged over the same period.

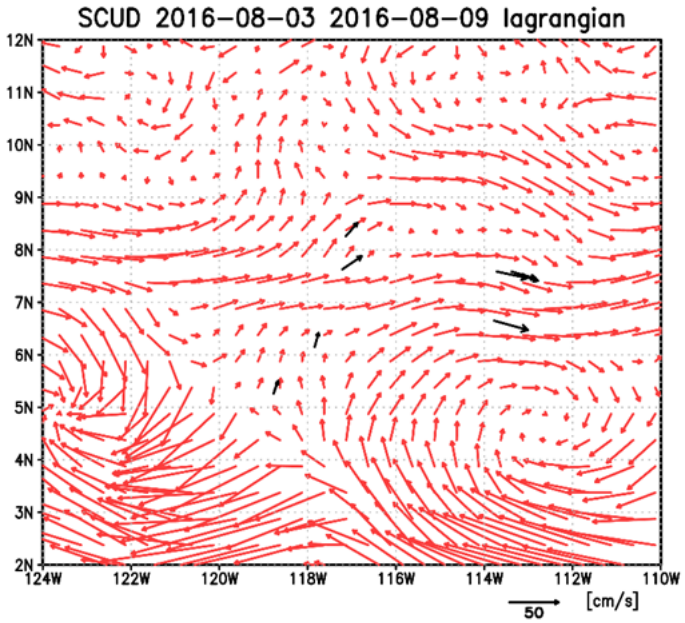

Figure 4. The same comparison as in Figure 3 but through drifter (black) and SCUD (red) velocities, averaged along week-long Lagrangian trajectories.

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