

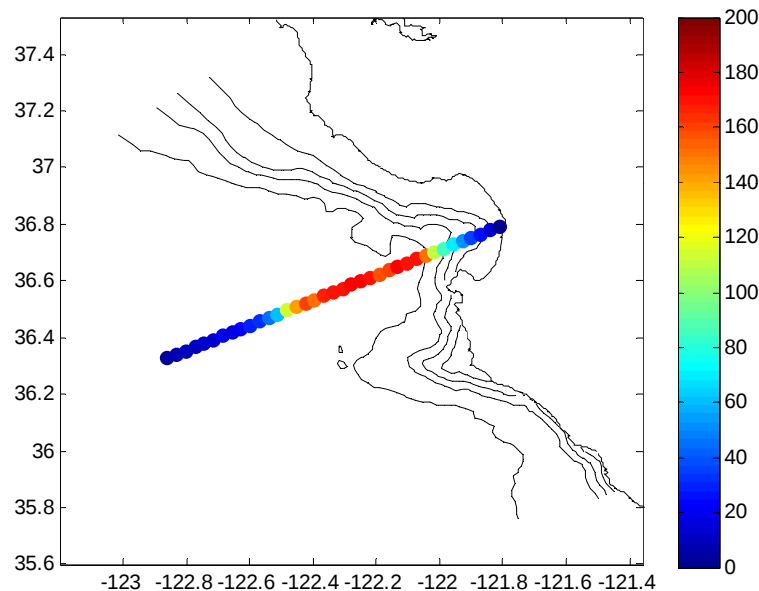
Statistics of drifter dispersion in larger Monterey Bay area

Preliminary results prepared by
Sergey Frolov

On June 20, 2011

Motivation and methods

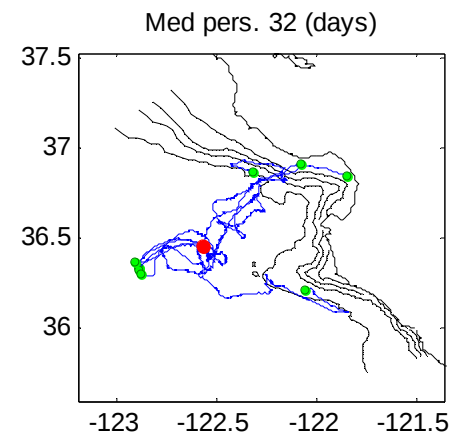
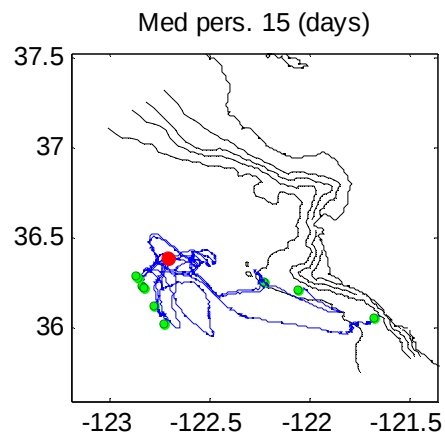
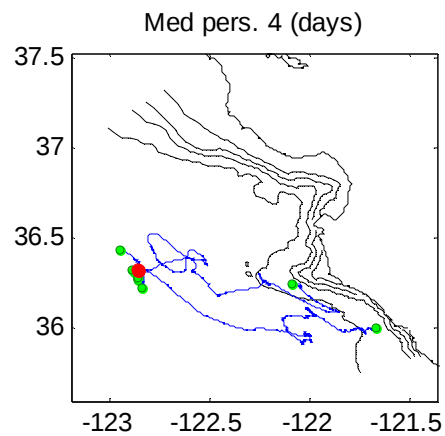
Deployment locations and median exit times (days)



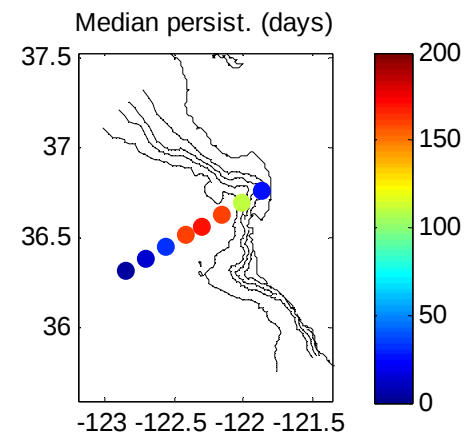
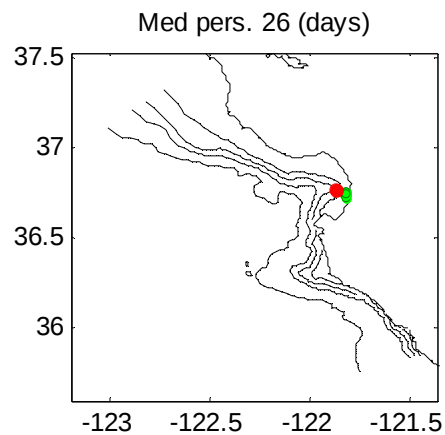
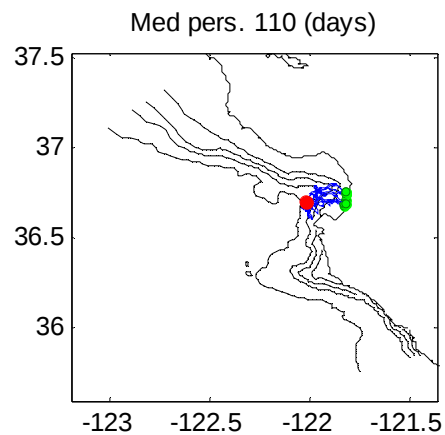
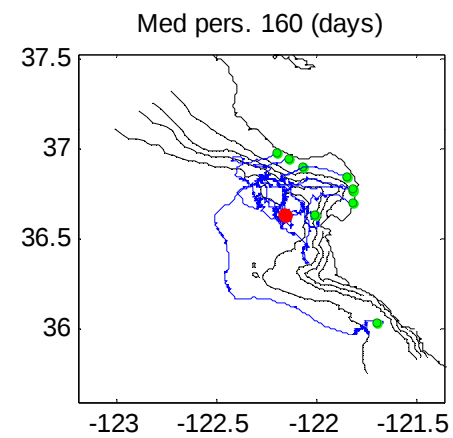
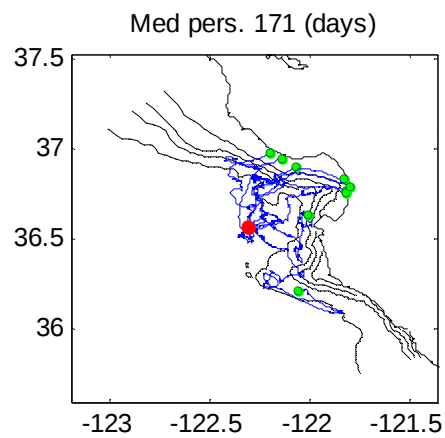
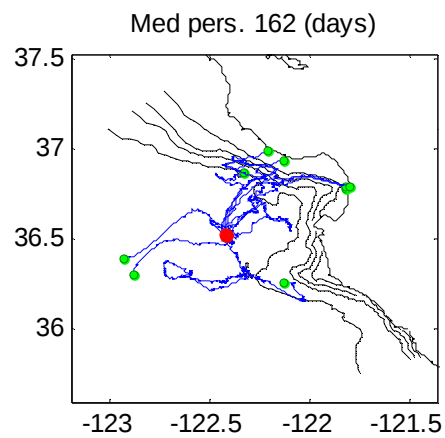
Depth contours are drawn at 100,
200, 400, and 1000 m depth

- Objective:
 - Determine if it is possible to establish a persistent monitoring system in a coastal zone using ARGO-style drifters
- Methods:
 - Every two weeks between October 2006 and April 2008.
 - Deploy drifters along CALCOFI line 67.
 - Advect drifters using 3D currents from the NCOM model. Drifters are advected upto 200 days.
 - Compute exit time from the domain.
- Drifter specifications:
 - Park either at 1000 m depth or, if shallower than 1000m, at the bottom.
 - Bottom-tagged drifters do not move.
 - Drifter vertical speed of 8 cm/s.
 - Telemetry period of 15 minutes.

Statistics of drifter escape paths

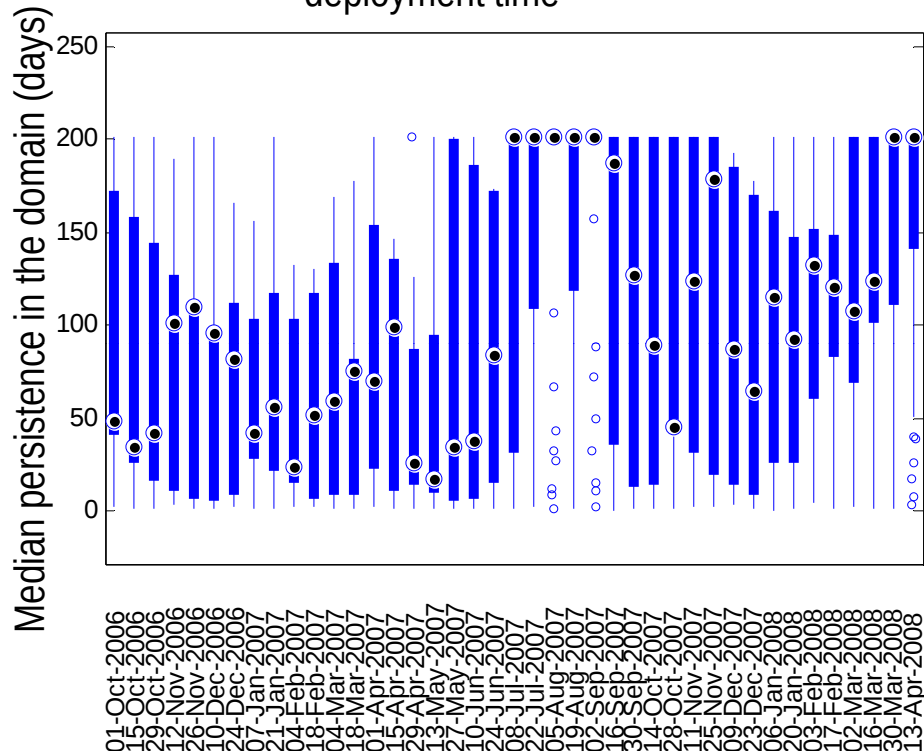


start
trajectory
end



Statistics of exit times

(b) Statistics of exit times (days) as a function of deployment time

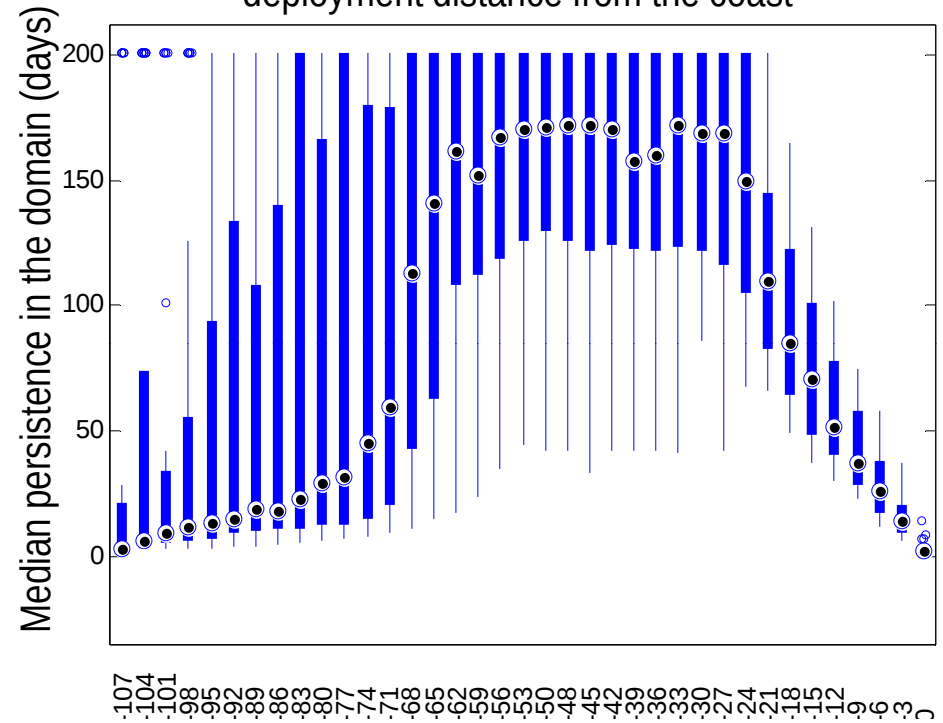


Deployment time

Shorter in
Fall-Winter-Spring

Longer in
Summer-Fall

(b) Statistics of exit times (days) as a function of the deployment distance from the coast



Deployment distance from shore (km)

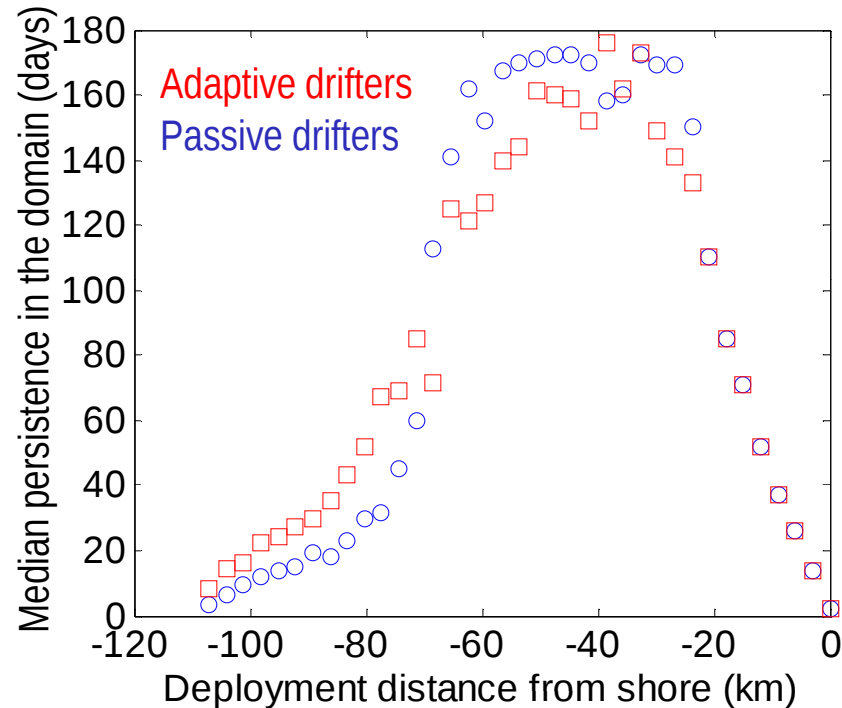
Exit through W.
Boundary

Beached in MB

Trapped on shelf

See for details on the previous slide

Can adaptive strategy help



- **Objective:**
 - Determine if it is possible to increase exit times by parking drifters at specified depth
- **Methods:**
 - For each parking depth, advect particles 1 day in the future.
 - Select parking depth that will result in a smallest departure from the deployment location
- **Discussion:**
 - Adaptive strategy increased exit times for particles that exit through western boundary.
 - Adaptive strategy reduced exit times for particles trapped on the shelf.
 - It is likely that more effective adaptive strategies are possible.