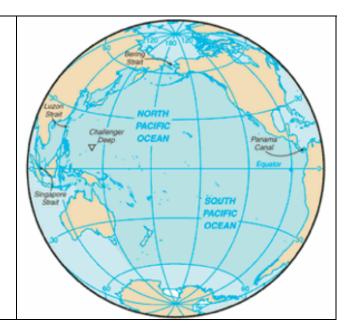| AdOc 2013 GEOL4060/5060 Exercise 5 **Revision through Currents**	Name: Id:

Issued 11Mar2013; Due at beginning of 15Mar2013 session. Give short answers, but please show your thinking.

Q1. How would the sea surface temperatures of regions affect the locations of low and high pressure weather cells ?	

Q2. Sketch: a. the primary circulations of the Pacific Ocean as directed arrows, label them with names and whether they are warm or cold currents. Which are western-intensified ? b. also the geometric (rotational equator, general location of the ITCZ, and directions of the trade winds.	

Q3. Giddy.com installs a 1m diameter round rotating table in a lab, with period 10s, and introduces a 1cm wide jet from the side at 0.01m/s speed. Will this jet be subject to artificial Coriolis effects ? Will ink dye in the pool show those effects ? How do you know ?	

Q4. If a sector of the ocean under an air pressure of 950 mbar has these densities (in kg/m^3), what will be the pressure in mbar at depth 100m ? 0-1m 1020, 1-10m 1023, 10-80 1030, 80-120 1025.	

Q5. Draw a schematic of the geostrophic box calculation between two locations in the ocean. Indicate the pressure head, coriolis effect, and the forces operating on one level in the ocean column.	

Q6. Write in bullet-point form, the causes of the Equatorial Counter Current (ECC), using the Pacific Ocean case	

Q7. In lectures we considered the adiabitic cooling of air as it rises and the resulting precipitation of water (e.g. rain). Knowing about the Latent Heat of water, will wet air cool more or less rapidly than dry air ?	

Q8. List all the scenarios you can, for upwelling in the ocean, including coastal waters.	

1 bar=10^5 N/m^2; 1 Newton (N) is the force of Earth's gravity on a mass of ~0.1 kg (i.e., 1/9.81 kg); P=ρgz; F=fmu; f=2 Ω sin(Φ); Ω=7.292*10^{-5} rad/s; F=Ma; $\dfrac{dP}{dX} = \rho g \tan(\theta)$