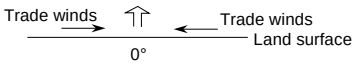
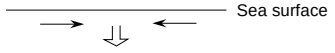
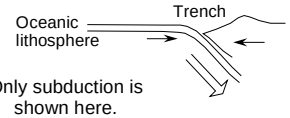
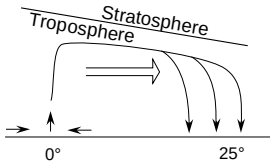
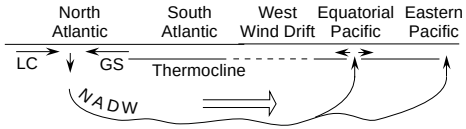
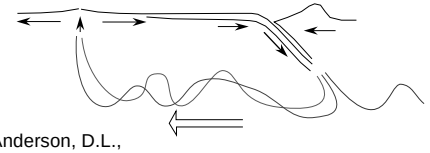
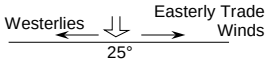
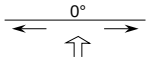
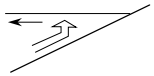
This document proposes that atmospheric, oceanic, and plate-tectonic circulation are all in essence the same thing. To summarize succinctly:
When stuff moves together (converges) at Earth's surface, stuff must move away from Earth's surface, and
When stuff moves apart (diverges) at Earth's surface, stuff must move toward Earth's surface to fill the void, regardless of whether that "stuff" is gas, liquid, or solid.

Large-scale flow in Earth systems

	Process				
	Atmospheric Circulation *(here, just the Hadley Cell)*	*Deep Ocean Circulation*	*Plate Tectonics* *(Lithospheric creep & asthenospheric flow)*	*Generalization*	*Differences*
Vertical motion away from Earth surface	Rise of heated air in Inter-Tropical (equatorial) Convergence Zone (ITCZ)  Convergence of "Trade Winds" or "Easterlies"	Sinking* of cold waters and Sinking* of waters at convergences  *called "subduction" by some physical oceanographers	Sinking of cooled oceanic lithosphere at Convergent Plate Boundaries (Subduction and/or rollback)  Only subduction is shown here.	Change of temperature* at Earth surface causes change of density, leading to departure from Earth surface at **convergences** *or salinity, for ocean circulation	Departure from Earth surface causes convergences of Trade Winds and plates, whereas oceanic convergences cause mixing that leads to sinking of dense waters.
Horizontal motion at distance from Earth surface	Poleward flow in upper troposphere  Flow in upper troposphere is poleward (as shown) *and* eastward.	Thermohaline circulation of "ocean conveyor belt" or "meridional overturning circulation"  Paths of deep flow are constrained horizontally by depth of seafloor.	Surface-driven ("Top-down")[1] circulation/convection of (upper?) asthenosphere  [1]Anderson, D.L., 2001, Top-down tectonics?: *Science,* v. 293, p. 2016-2018.	Long horizontal transport relative to shorter vertical transport (most strikingly so in ocean circulation, where horizontal distance is thousands of times vertical distance)	Altitude of atmospheric flow and depth of oceanic flow are relatively well known, but depth of astheno-spheric flow is hotly debated.
Vertical motion back toward Earth surface	Sinking of dry air into high-pressure zones in Horse Latitudes  Divergence of easterlies & westerlies	Equatorial Upwelling  Coastal Upwelling  Divergence of surface currents from each other, or from coastline	Divergent Plate Boundaries at Mid-Ocean Ridges  Upwelling of asthenosphere to form new lithosphere	**Divergence,** and surface-ward motion of mass to fill void at surface left by divergence	Area of return to surface is diffuse in atmospheric & oceanic circula-tion, but localized at "crack" between divergent lithospheric plates.
Horizontal motion at Earth surface	Trade winds	Surface currents from Pacific to Atlantic	Motion of plates of lithosphere (plate tectonics, in strict sense)	Compared to the above, these are what we most commonly see.	Winds & surface currents flow, but plates are rigid.
Time scale for flow through cycle	30-60 days	~1000 years	Hundreds of millions of years	Rate of flow is viscosity-dependent	Some or much of asthenosphere may not partici-pate in cycle.
Ultimate source of energy	Solar radiation	Solar radiation	Radioactivity within Earth		