

Topics you should be familiar with for AOS 311 Exam 1

- 1) Material from AOS310, specifically:
  - a. Geostrophic, hydrostatic, and thermal wind balance
  - b. Thickness
  - c. Divergence, gradient, and curl
  - d. Vorticity
  - e. Governing equations:
    - i. Momentum
    - ii. Thermodynamic equation
    - iii. Equation of state for dry air
    - iv. Mass continuity equation
  - f. Streamfunction and velocity potential
- 2) Boussinesq fluids
- 3) Barotropic and baroclinic fluids
- 4) Circulation and circulation theorems
- 5) Vorticity equation
- 6) Potential vorticity (shallow water; QG; two-dimensional, non-divergent)
- 7) QG vorticity and thermodynamic equations
- 8) QG  $\omega$ -equation and height tendency equation
- 9) Invertibility (requirements, definitions, and consequences)
- 10) Rossby waves