

Question title: Single Layer Shallow Water

A single layer shallow water approximation is good for flows that are (select as many as apply):

- 1. stratified vertically in density
- 2. baroclinic
- 3. hydrostatic (i.e., shallow)
- 4. forced by surface elevation variations
- 5. possessing smaller vertical velocities than horizontal ones

Question title: Meaning of multiple layers

Multiple layer shallow water equations are good for describing (select many):

- 1. density stratified fluids
- 2. fluids where the vertical velocities are smaller than the horizontal
- 3. hydrostatic fluids
- 4. incompressible fluids
- 5. unstably stratified fluids (i.e., where the potential density isn't monotonic with depth)

Question title: Height and Volume

The layer height equation in shallow water equations is the equivalent to the conservation of volume in the Boussinesq equations.

- True False

Question title: Unmoving Layers

It is not possible to specify that some of the layers in a shallow water system are not allowed to move.

- True False

Question title: Conservation Properties of Shallow

A consistent version of energy can be formed for the shallow water equations, and conservation laws for it are available.

- True False