

Activity 4 – Run an idealized ocean basin with topography

Building on the previous case (turbulent gyre):

1. Impact of topography

- Edit the file `ana_grid.F` and add a zonal slope at the western boundary.

```
# elif defined BASIN
do j=JstrR,JendR
  do i=IstrR,IendR
    h(i,j)=depth * ( 1. - exp(-10.*(xr(i,j)/xl)))
```

- Check the barotropic vorticity balance. What is the now dominant balance at the western boundary?

2. Impact of topography again

- Edit the file `ana_grid.F` and add a seamount (or a chain of seamounts) in the middle of your domain
- Check the barotropic vorticity and energy balance
- Plot a horizontal section of relative vorticity at the depth of the seamounts

3. Check pressure-gradient errors

- Remove the wind forcing and see what happens.
- Play with the vertical coordinate to increase the pressure-gradient errors.