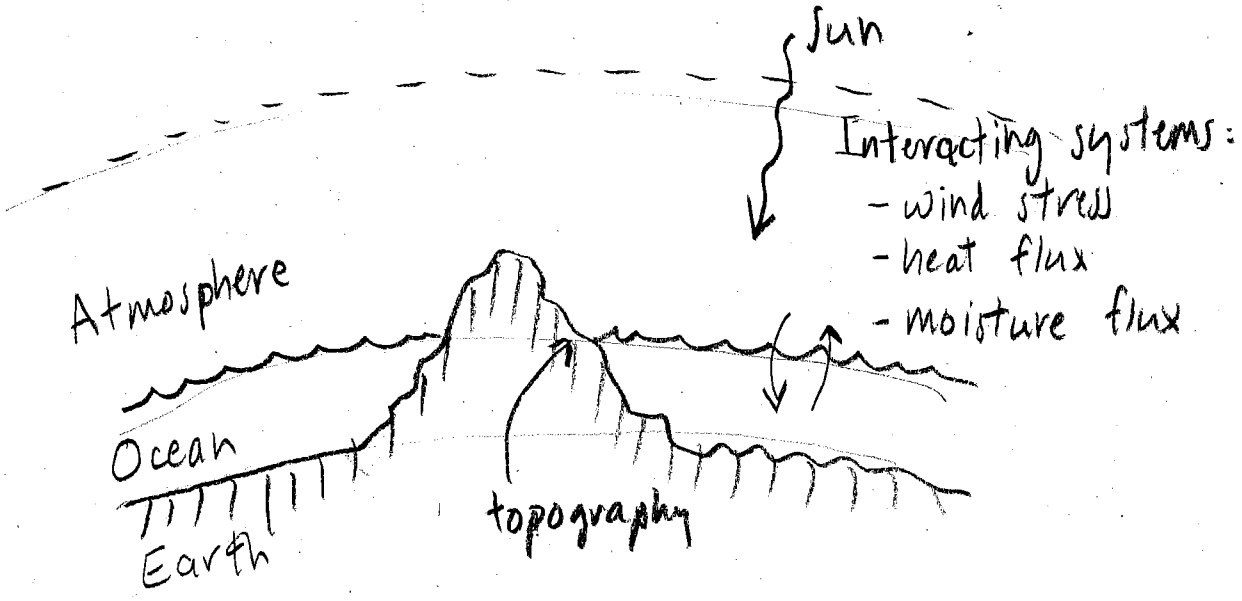
GFD I Introduction

Geophysical Fluid Dynamics – the study of fluid flow on planets, esp. Earth, at scales where rotation & stratification matter



Scales of "energy containing" motions

	Atmosphere[1]	Ocean[2]
Length	1000 km	50 km
Height	10 km	1 km
Velocity	10 m s^{-1}	0.5 m s^{-1}
Density	1.2 kg m^{-3}	1000 kg m^{-3}

1. Mid-latitude cyclonic storm

2. Gulf Stream eddy

Shared scale

frequency of Earth's rotation ~ 1/day

Differences

Atm. is heated at its bottom surface, and internally

Ocean is heated at its top surface

Questions

Why are atmospheric flows so much faster?

Why are atmospheric flows so much larger in horizontal scale?

How do these motions gain & lose energy?