

## EXAM \#1 NEXT TIME

- Exam composition:
- 50-60\% Short Answer, Multiple Guess or Matching
- 50-40\% Short explanation, draw and explain or problems
- You will have whole 50 minutes
- We will begin promptly at 11:00 and end at 11:50 AM.
- Bring pencils and a scientific calculator
- ASSIGNMENTS for Wednesday and Friday: Waves: E147-152; and Storm Surge E 165-171.




Worldwide Tropical Cyclone Occurrence

| Basin | Named | All Hurricane <br> Strength | Major Huricane <br> strength |
| :--- | :---: | :---: | :---: |
| NW Pacific | 26.7 | 16.9 | 8.5 |
| S Indian | 20.6 | 10.3 | 4.3 |
| NE Pacific | 16.3 | 9.0 | 4.1 |
| N Atlantic | 10.6 | 5.9 | 2.0 |
| SW Pacific | 10.6 | 4.8 | 1.9 |
| N Indian | 5.4 | 2.2 | 0.4 |

$\underset{\sim}{\sim} \sim 80$ named storms worldwide
$\sim 30>33 \mathrm{~m} \mathrm{~s}^{-1}$

## Necessary Conditions for Tropical Cyclone Formation

- Ocean warmer than $26^{\circ} \mathrm{C}$
- Reasonably humid at 2-5 km altitude ( $\sim 80 \%$ RH... under reexamination)
- Rising saturated air is warmer than its surroundings (conditional instability)
- Weak vertical shear (< $12.5 \mathrm{~m} \mathrm{~s}^{-1}$ )
- Pre-existing disturbance
- More than $5^{\circ}$ latitude from the Equator



## Interaction between a hurricane and a front



Front is already unstable

- Hurricane triggers baroclinic instability
- Causing a frontal cyclone to form
- Which merges with the hurricane
- ...or maybe the fronts wrap into the hurricane circulation
- Hazel in 1954



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