AOSC200:
Weather and Climate Discussion

Sections 0101, 0102

TA: Agniv Sengupta

24 April, 2019

Group Project #2

Project #2: Weather and Climate Advisory Team

Please refer:

https://www.aosc.umd.edu/~asengupta/AOSC200/AOSC200.Project2.Directions.pdf

Project #2: Section 0101 Topics

1. Group 1: *California Wildfire and Air Quality (State/Federal govt. official)*
2. Group 2: *Prepare a realistic energy plan that maximizes economic benefit and minimizes health risks and environmental damage (CEO of Fortune 500 company)*
3. *Group 3: Coastal Restoration Methods (Government Official)*
4. Group 4: *Decline of Arctic Sea Ice and its Effects (Government Official)*
5. Group 5: *Carbon Taxation (UNEP Personnel)*
6. Group 6: *Chesapeake Bay: Impacts of Climate Change (Maryland State Official)*

Project #2: Section 0102 Topics

1. Group 1: *Impacts of Rising Sea Levels (large investor)*
2. Group 2: *Chesapeake Bay: Impacts of Climate Change (CEO of a seafood company)*
3. Group 3: *Carbon Taxation (Government Official)*
4. Group 4: *Impact from Hurricanes with Recommendations for Improvements (State/govt. official)*
5. Group 5: *Coastal Restoration Methods (State/Federal Official)*
6. Group 6: *California Wildfires and its Impact on Air Quality (Federal Official)*

Project#2: Important Dates

- Before Presentations
  - 4-17
    - Group Rough draft due (ELMS)
    - Individual Rough draft due (ELMS)
    - ½ way Peer Evaluations due (ELMS)

- Presentations
  - 5-1 (1st Day of Presentations)
    - Final Group Briefing Document containing Annotated Bibliography must be turned in BEFORE discussion; EMAIL me your Project Presentations *at least 1 hour before class*.
  - 5-8 (2nd Day of Presentations)
    - Individual Write-ups due
    - Final Peer Reviews Due

Project#2: General Comments on Group & Individual Drafts

- I have posted comments and suggestions on every ELMS submission.
- Check your sources: They should be from a government, or a university website, or a peer-reviewed scientific journal.
- The Conclusion part should provide specific recommendations to the government official/CEO of company, since you're part of an advisory team.
- High similarity score, especially in individual draft: Result of using direct quotes or copying exact sentences from sources. A similarity score <15% is preferred.
- Annotations missing in group bibliography: For your final submission, please ensure that you use an annotated bibliography.

Which is considered plagiarism?

Copying word for word from another writer and citing/not citing them

Yes

Copying material from several writers and rearranging with citation

Yes

Paraphrasing (changing the words of the original source) with citation

No

Paraphrasing (changing the words of the original source) without citation

Yes

Failing to cite info that is common knowledge

Yes

Putting ideas into your own words with citation

No

Group Project #2

Presentations: May 1st and May 8th

- Time length: 12 minutes (presentation) and 3 minutes for questions
  - Project should be divided evenly with each member contributing equally by content and duration

- You may use a PowerPoint or another form of visual aid
  - The Quality of visual aid presented will be judged
  - Points will be deducted for simply reading off a slide, or, using notecards/phone/laptop

- Other things to consider: Overall quality, Knowledge of Topic, Relevance to the person being presented, Ability to explain clearly and concisely, Group Coordination.

Due Dates

- **5/1**: All projects must be turned in before class (first day of presentations). What does this consist of?
  - Final version of your Group Briefing (submitted to ELMS); include your Annotated Bibliography at the end of the briefing. Every Group member is required to submit the Group Briefing.
  - **PowerPoint** needs to be emailed (*by any 1 person in the group email thread*) *at least 1 hour before class meeting* → enough information so that each group member can speak for approximately 2 minutes 20 seconds.

- **5/8**: Final Peer Evaluations and Individual Write-ups due at 11:59 pm

Group Project #2

Final Group Paper- Due May 1st *(before discussion)*

- Highlight only the key points of your presentation.
- This should be clear and concise. Complete sentences with a consistent formatting is essential.
- Grammar, Spelling, and Completeness of Ideas are essential components.
- Each person of the group is suggested to include 2 or 3 reputable sources (peer-reviewed journal, government, or University) for this group briefing. The document needs to have proper intext citations and a group annotated bibliography at the end. Organize citations according to each group member.

Group Project #2

Individual write-up-Due May 8th

- This must be a properly cited, in-depth written analysis prepared for the government official/company CEO/head of investment firm.
- *2-pages in length, single-spaced, font size 12, Times New Roman, 1" Margins*.
- Paragraph form with proper grammar and spelling is a requirement.
- 5 MLA in-text citations, and an annotated bibliography at the end (bibliography does not count toward the 2-page length requirement).
- The expectation is that this essay will be an original work. Please DO NOT use direct quotes/exact sentences from sources. A Plagiarism detector will be used.
- It is okay to paraphrase; don't simply copy-paste from another work/article.

Project#2: Attendance

- Everyone needs to be present on the days of the presentation **ON TIME** → there will be an assignment that counts as participation points.
- Audience Participation Sheet will be provided at the beginning of each debate, and collected after discussion.
- Make sure to turn this document in for Participation Points.

Group Project #2

Today you will:

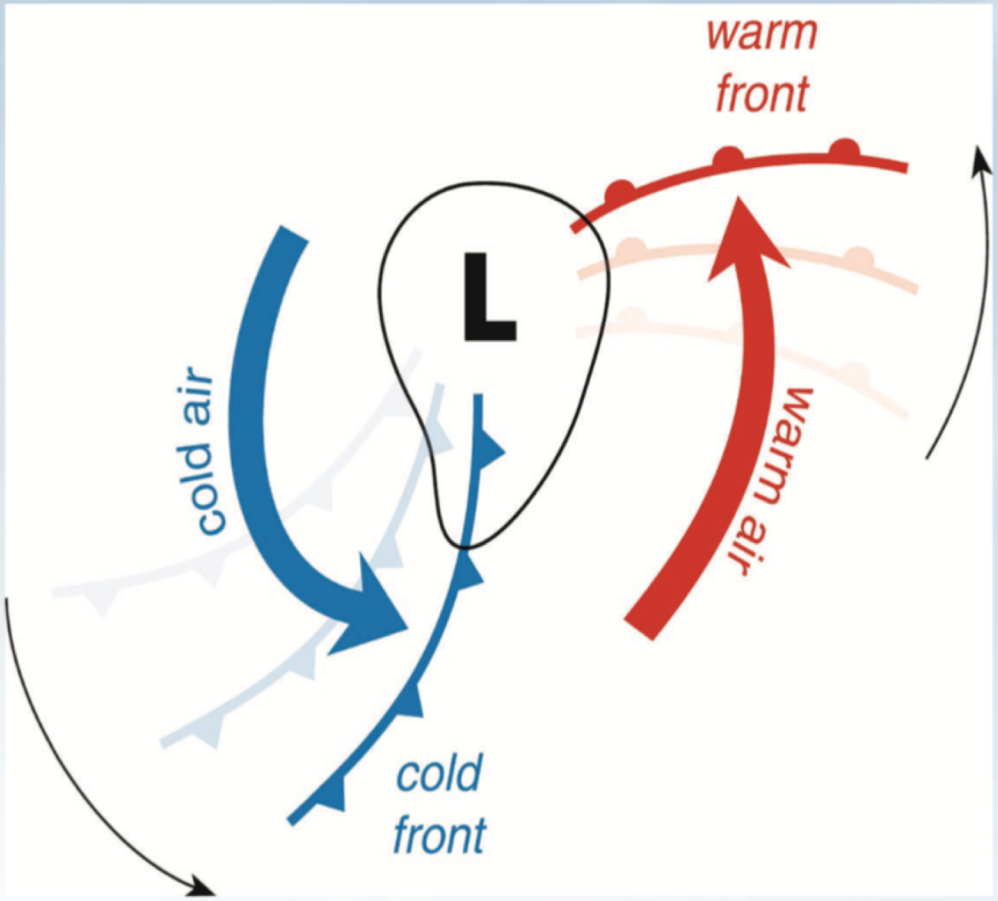
1. Collaborate with your group members on your research topic.

2. Finalize your sources for your sub-topics. Finalize your group briefing document; start building a Powerpoint presentation.

3. You have ~ 20 minutes of class time dedicated towards group work on your project.

4. Kindly let me know if you have any questions or concerns. I am happy to help you

Mid-latitude cyclones

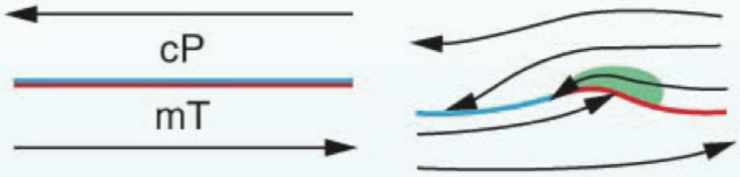


Cold, warm, and occluded fronts are often part of a larger system called the *mid-latitude* or *extra-tropical cyclone*

Cyclone Model

1920's: Bjerknes described the evolution of cyclones

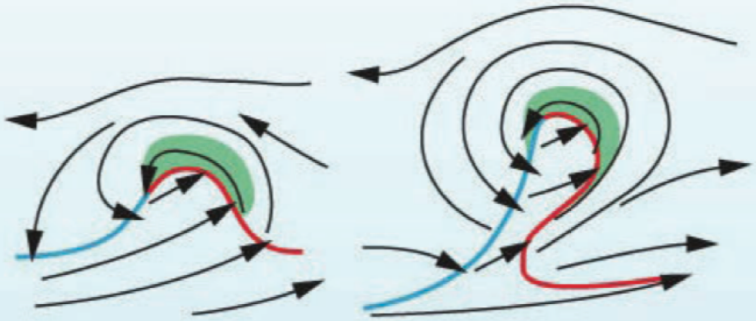
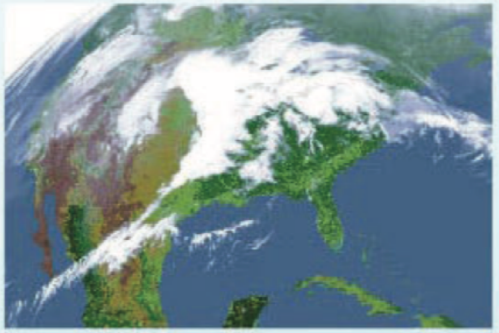
Begins as a frontal wave along stationary front separating cP air from mT air – birth stage

Stage	Weather Map Depiction of Norwegian Cyclone Model	Typical Satellite Image of Life-Cycle Stage	Typical Sea-Level Pressure at Cyclone Center
Birth (frontal wave)			1000-1010 mb

Cyclone Model

1920's: Bjerknes described the evolution of cyclones

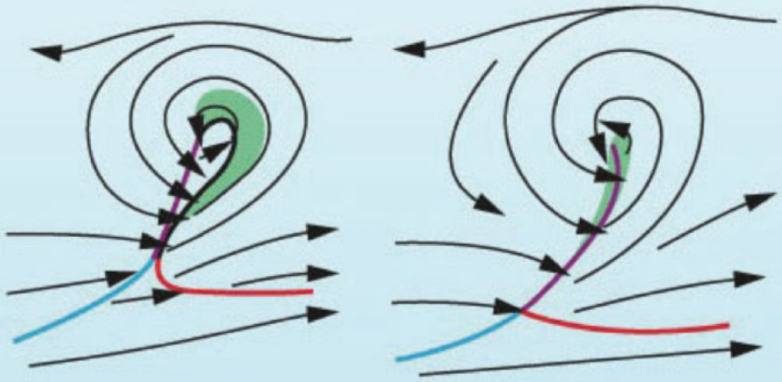
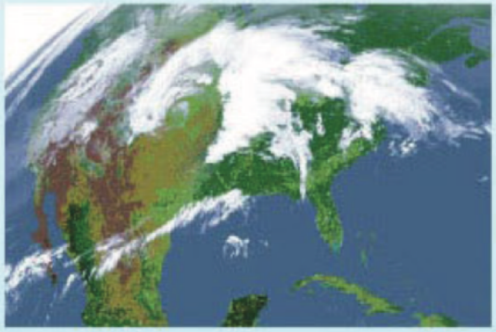
Open wave develops strong cold and warm fronts, precipitations falls along broad area – young adult stage

Stage	Weather Map Depiction of Norwegian Cyclone Model	Typical Satellite Image of Life-Cycle Stage	Typical Sea-Level Pressure at Cyclone Center
Young adult (open wave)			990-1000 mb

Cyclone Model

1920's: Bjerknes described the evolution of cyclones

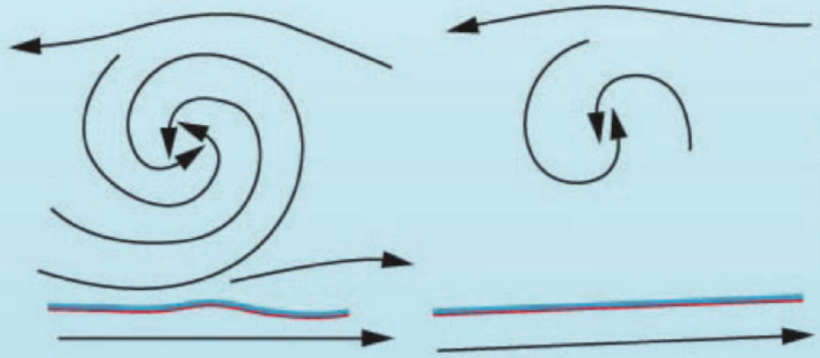
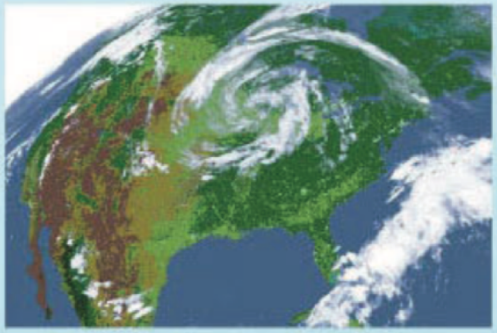
Occluded front develops, pressure reaches minimum, winds reach maximum, – mature stage

Stage	Weather Map Depiction of Norwegian Cyclone Model	Typical Satellite Image of Life-Cycle Stage	Typical Sea-Level Pressure at Cyclone Center
Mature (occluded cyclone)			960-990 mb

Cyclone Model

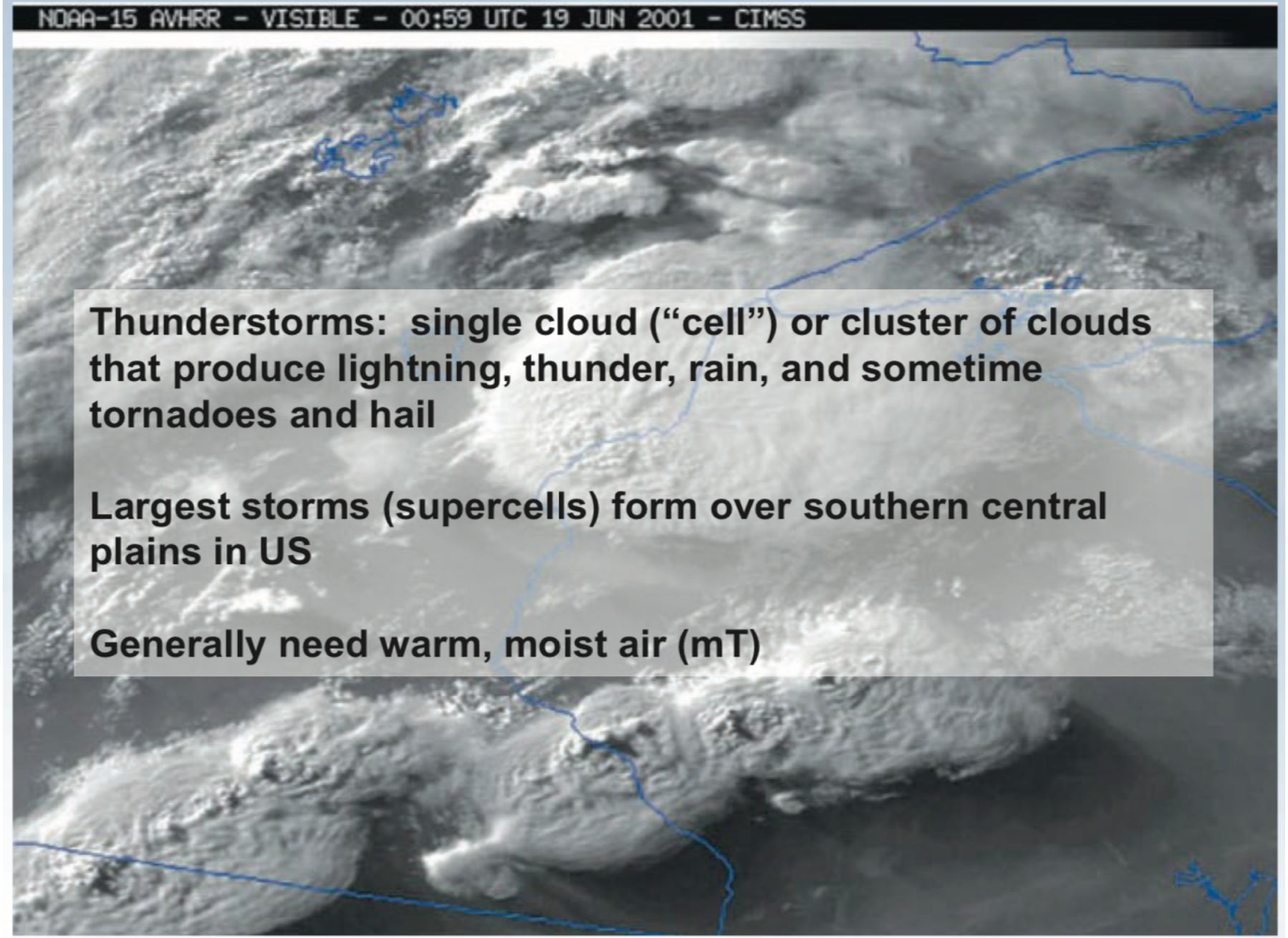
1920's: Bjerknes described the evolution of cyclones

Cut-off cyclone develops, pressure rises, clouds and precipitation dissipates – death stage ☹

Stage	Weather Map Depiction of Norwegian Cyclone Model	Typical Satellite Image of Life-Cycle Stage	Typical Sea-Level Pressure at Cyclone Center
Death (cut-off cyclone)			Slowly rising from 960-990 mb up to 1010 mb

This process is called cyclogenesis!

Thunderstorms

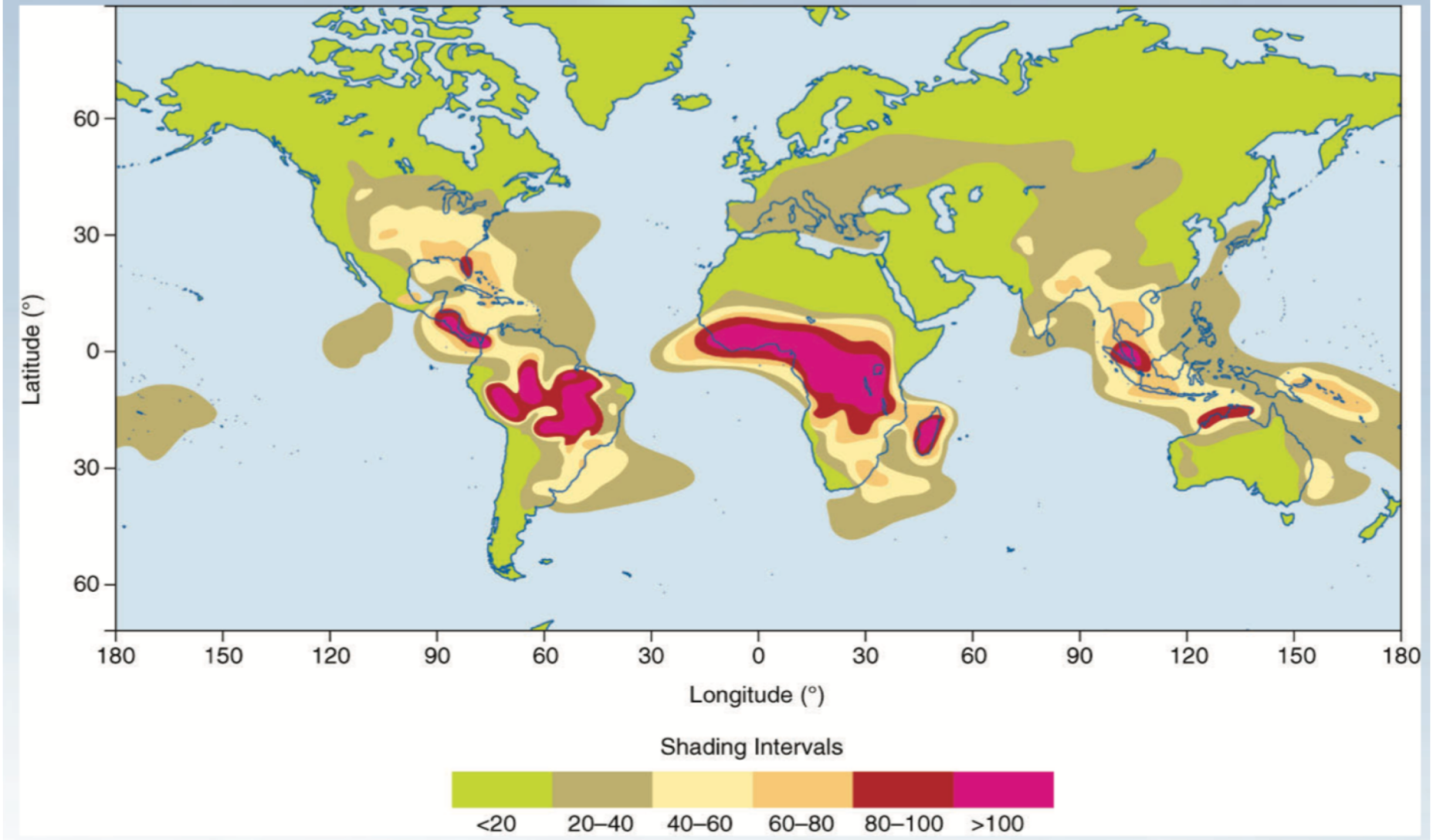


Thunderstorms: single cloud ("cell") or cluster of clouds that produce lightning, thunder, rain, and sometime tornadoes and hail

Largest storms (supercells) form over southern central plains in US

Generally need warm, moist air (mT)

Thunderstorm Locations

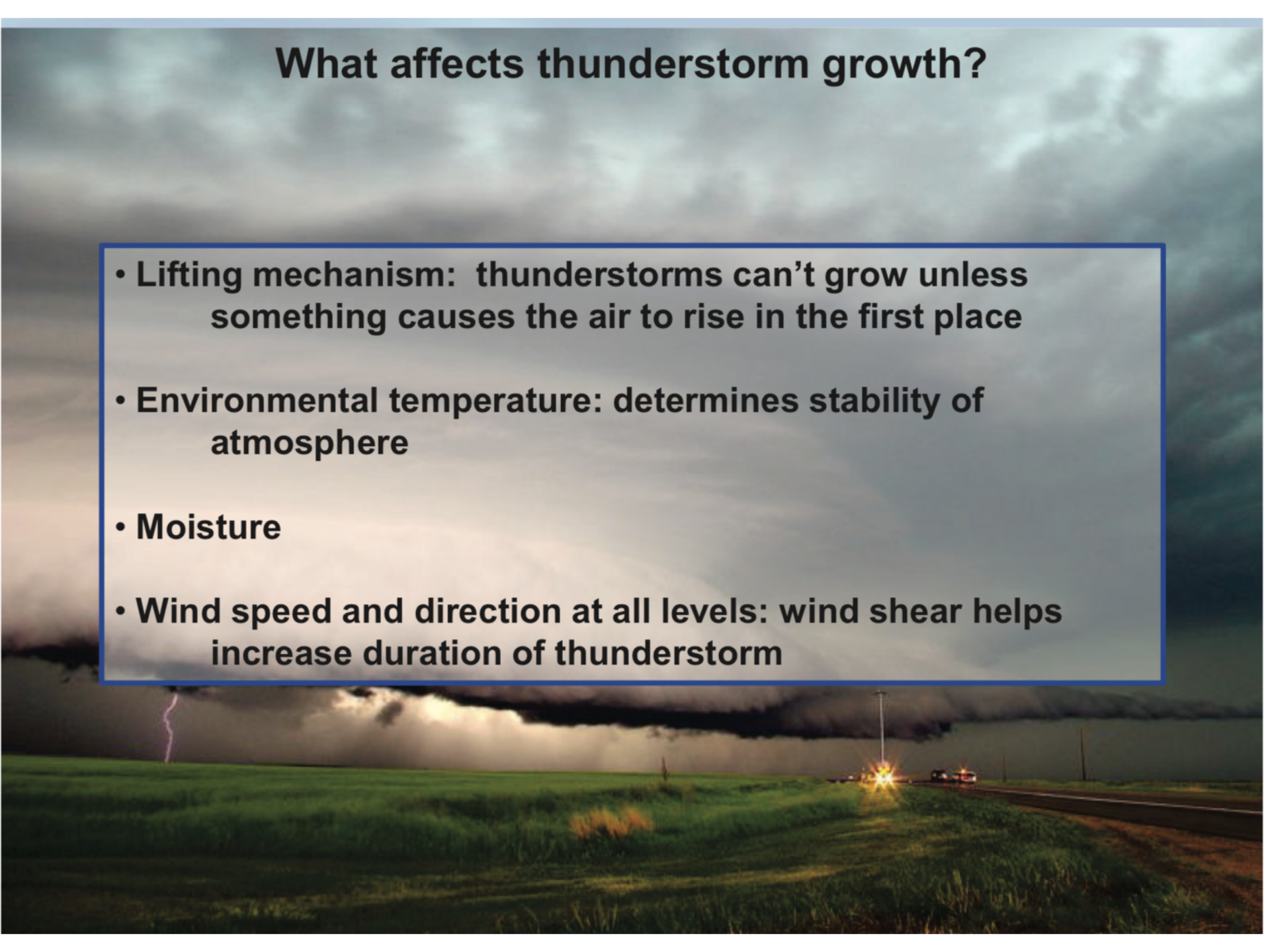


Thunderstorms need convection of warm, moist air

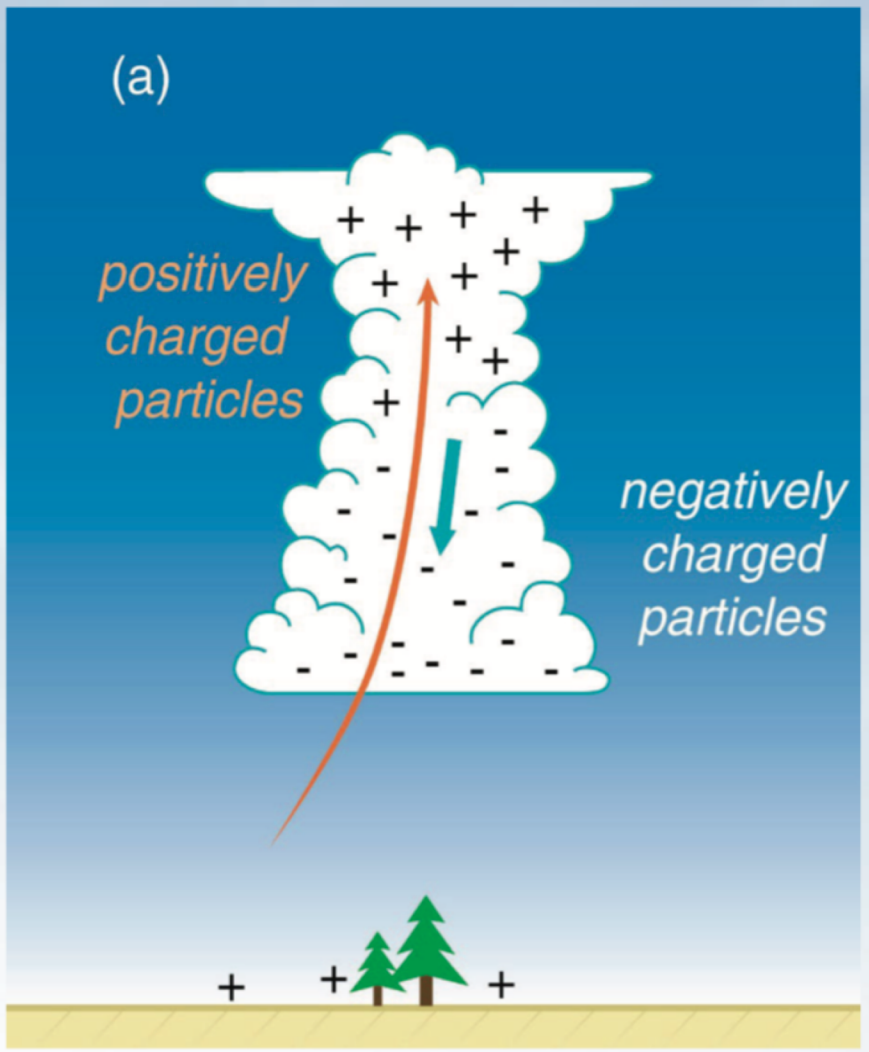
Most likely to occur around ITCZ

What affects thunderstorm growth?

- Lifting mechanism: thunderstorms can't grow unless something causes the air to rise in the first place
- Environmental temperature: determines stability of atmosphere
- Moisture
- Wind speed and direction at all levels: wind shear helps increase duration of thunderstorm



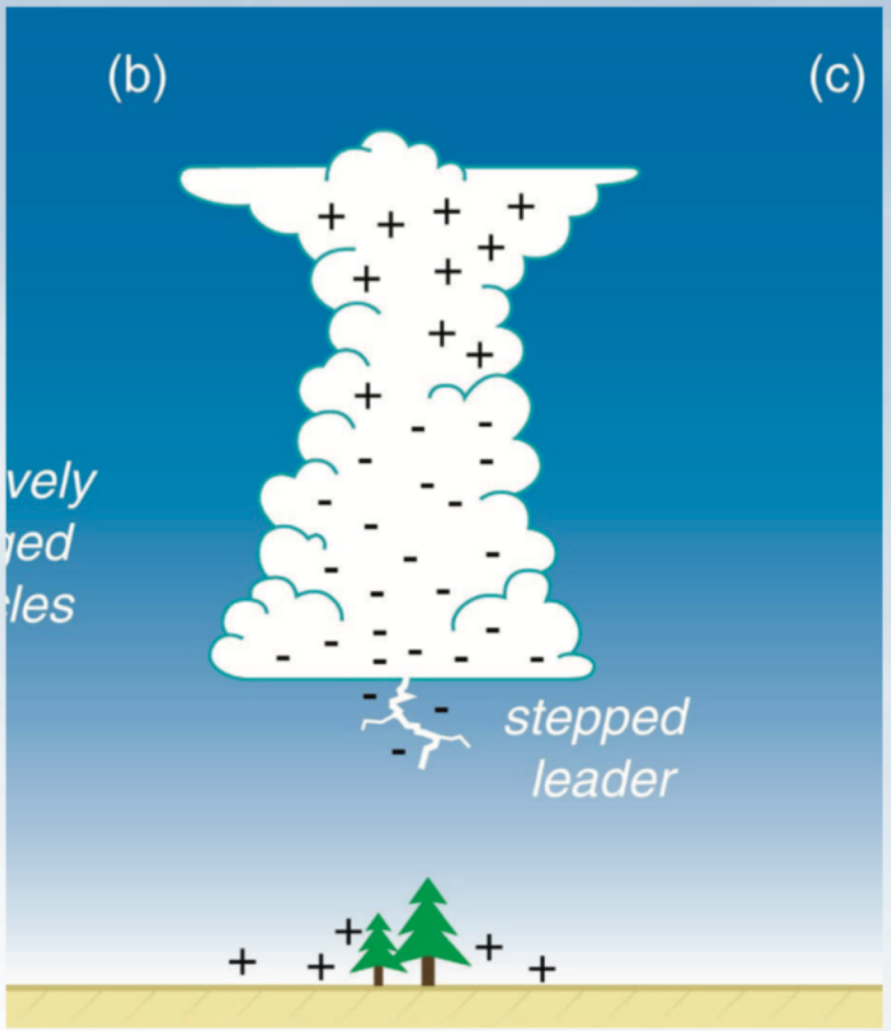
Lightning



Charge separation occurs due to collisions between ice crystals and water droplets and/or graupel…

Updrafts carry positive charges up and the negatively charged graupel sink to cloud base

Lightning



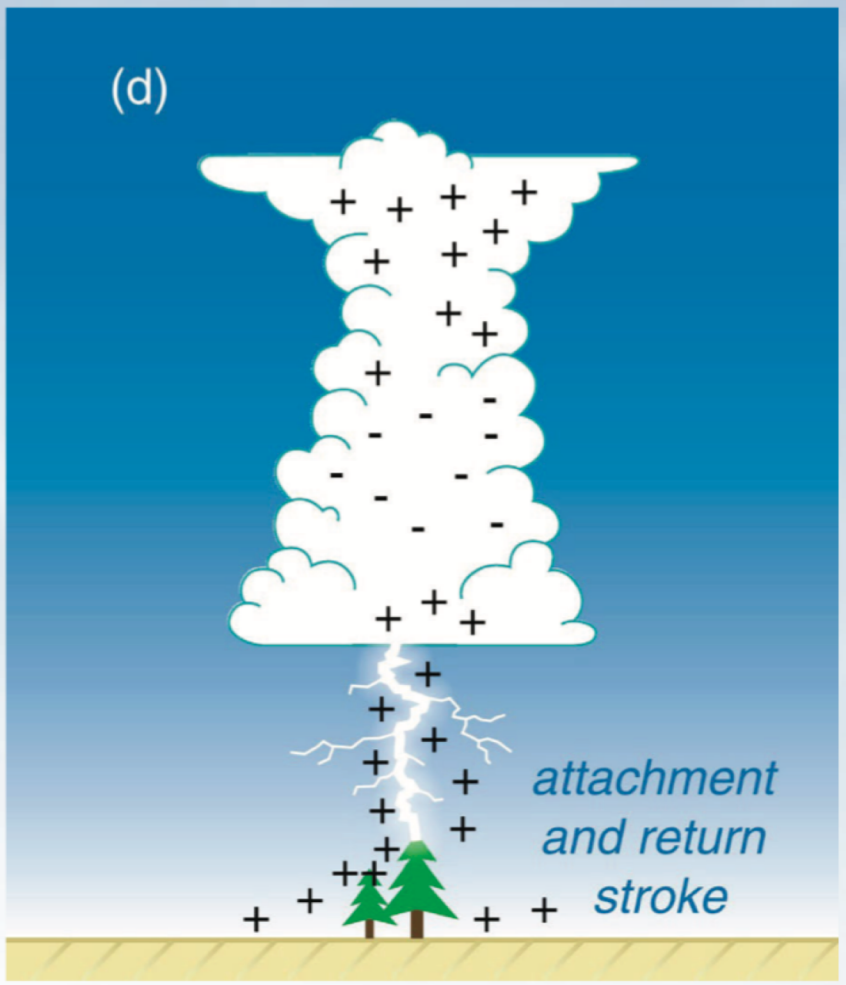
When the charge builds up enough:

Induced charge forms at surface

Cloud sends out pilot leader followed by a *stepped leader*

Basically, the negative charges are trying to find a way to get to the ground

Lightning



Ground sends out positive streamers that wait for the stepped leaders to make contact

Once contact is made, an ionized channel is created between cloud and ground

Positive charges rush up through the channel making the *return stroke*

This is the brightest part of the lightning

Process can happen several times, very rapidly

Questions ?

Email me: agnivs@umd.edu