Lesson Plan

Synoptic Climatology

Week 3

Materials needed: weather maps with specific information.

Objectives:

Basic:

1. concept of synoptic climatology
2. recognize weather station model and read variables
3. know definition of different air masses and source regions
4. concepts of different types of fronts and understand its structure
5. concept of extratropical (middle latitude) cyclone model

Advanced:

1. Describe weather conditions using weather station model
2. Be able to determine different types of air masses given a map
3. Be able to identify different types of fronts and understand its structure and weather conditions associated with them
4. Understanding isobars and weather maps
5. Different areas of synoptic research and applications

Background:

Basic synoptic meteorology concepts is a necessary foundation for synoptic climatology research. The knowledge of weather map and its creation is key to development in synoptic climatology related research.

Introduction to lesson: you learn to read and analyze synoptic weather maps.

Procedure

Pre-Class Individual Activities and Resources (follow the powerpoint notes for material and video)

Steps	Purpose	Estimated Time	Learning Objectives
1. Learn weather station model	Familiarize the station model	45 minutes	Read variable correctly on temp, dew point, pressure, cloud cover, wind direction and intensity
2. Air masses	Describe different types of air masses and source regions	15 minutes	Be able to identify different air masses given a set of basic variables

	Steps		Estimated Time	Learning Objectives
3.	Fronts	Concepts of types of fronts	30 minutes	Be able to identify fronts and its relationship with air masses
4.	Norwegian extratropical cyclone model	Evolution of a cyclone	30 minutes	Understand the process and relationship with air mass
5.	Isobars, isoheights, and weather maps	Concepts of isobars, surface weather maps and upper air weather map	30 minutes	Be able to interpret weather map and tell what is going on in the atmosphere

In-class Activities

Steps	purpose	Estimated Time	Learning Objectives
1. Read variables and describe weather using a station model	Application of knowledge	5	Reinforce knowledge
2. Draw a station model using given variables	In depth application	5	Solidify knowledge
3. Weather map reading	Literacy in weather map	15	Get used to reading surface map
4. Weather map analyses I.	Identify and draw fronts, label air masses on a surface weather map	15	Application skill development and deep understanding of air masses
5. Weather map analyses II.	The same as above; describe what happened on the cyclone, fronts, and how weather changes at a location	15	Deep understanding of cyclone evolution and weather conditions associated with it

Closure/Evaluation:

Analysis: quizzes will be given and some products of in-class activities will be collected as part of homework grades; results will be discussed during classes, so everyone understand the material.

Post-class activities: review what we practiced in the class if you have not digested them. Prepare for next class' pre-class activities.

Connections to Future Less Plan: the next class will be on the synoptic climatology research development and applications.