

INTRODUCTION TO THE CLIMATE SYSTEM

EOS 795/895

Required Text::

- R. Barry and R. Chorley, 1998, Atmosphere, Weather and Climate, Seventh Edition, Routledge.

Other References:

- Kump, Kasting, and Crane, 1999, The Earth System, Prentice Hall
- J.T. Houghton et al., 1996, Climate Change 1995: The Science of Climate Change, Cambridge Univ. Press

•ASSIGNED READINGS

Grading:

Quizzes and formal oral presentations (70%)

class participation (15%)

one paper (15%)

Class Schedule:

Introduction to class structure, goals, expectations

I. BASIC WEATHER

Atmospheric structure and composition

Atmospheric moisture and pressure

General Circulation

QUIZ (30 min) and Applied Climatology

II. ZONAL CLIMATE

Tropical

Polar

Mid-Latitude

SPECIAL SEMINAR

III. TELECONNECTIONS

El Niño Southern Oscillation (ENSO)

North Atlantic Oscillation (NAO)

QUIZ and class discussion

IV. SYNOPOTIC CLIMATOLOGY AND FORECASTING

Intro to forecasting

Forecasting Models (Eta, NGM, ECMWF, MRF)

Weather Map exercise

Weather forecasting exercise at Plymouth State College

V. DATA ACQUISITION AND MANIPULATION

Paleoclimate and other data

Meteorological Data

Intro to Matlab

Matlab exercises

Matlab exercises and student presentation

VI. CLIMATE VARIABILITY

Natural climate variability and forcings

Natural climate variability and forcings

Anthropogenic perturbations — acid rain, urban smog and ozone holes

Greenhouse gases, aerosols

Debate on "global warming"

VII. CLIMATE MODELING

Atmosphere and ocean models

Terrestrial models

Earth System models

Student oral presentations

