Small Scale Air-Sea Interaction

ATMO/OCN 665

Kelvin Richards

Fall 2022

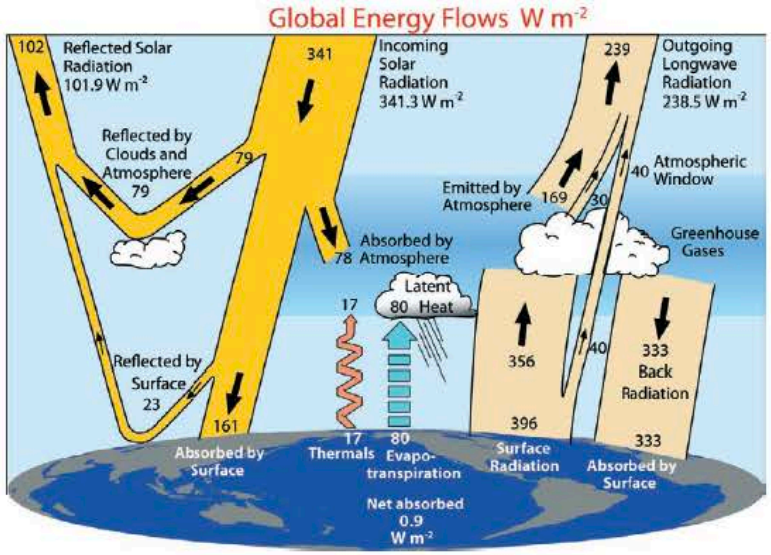
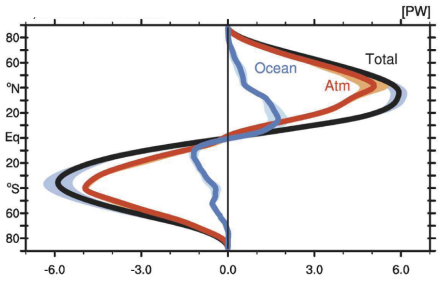


FIG. 1. The global annual mean Earth's energy budget for the Mar 2000 to May 2004 period (W m^{-2}). The broad arrows indicate the schematic flow of energy in proportion to their importance.

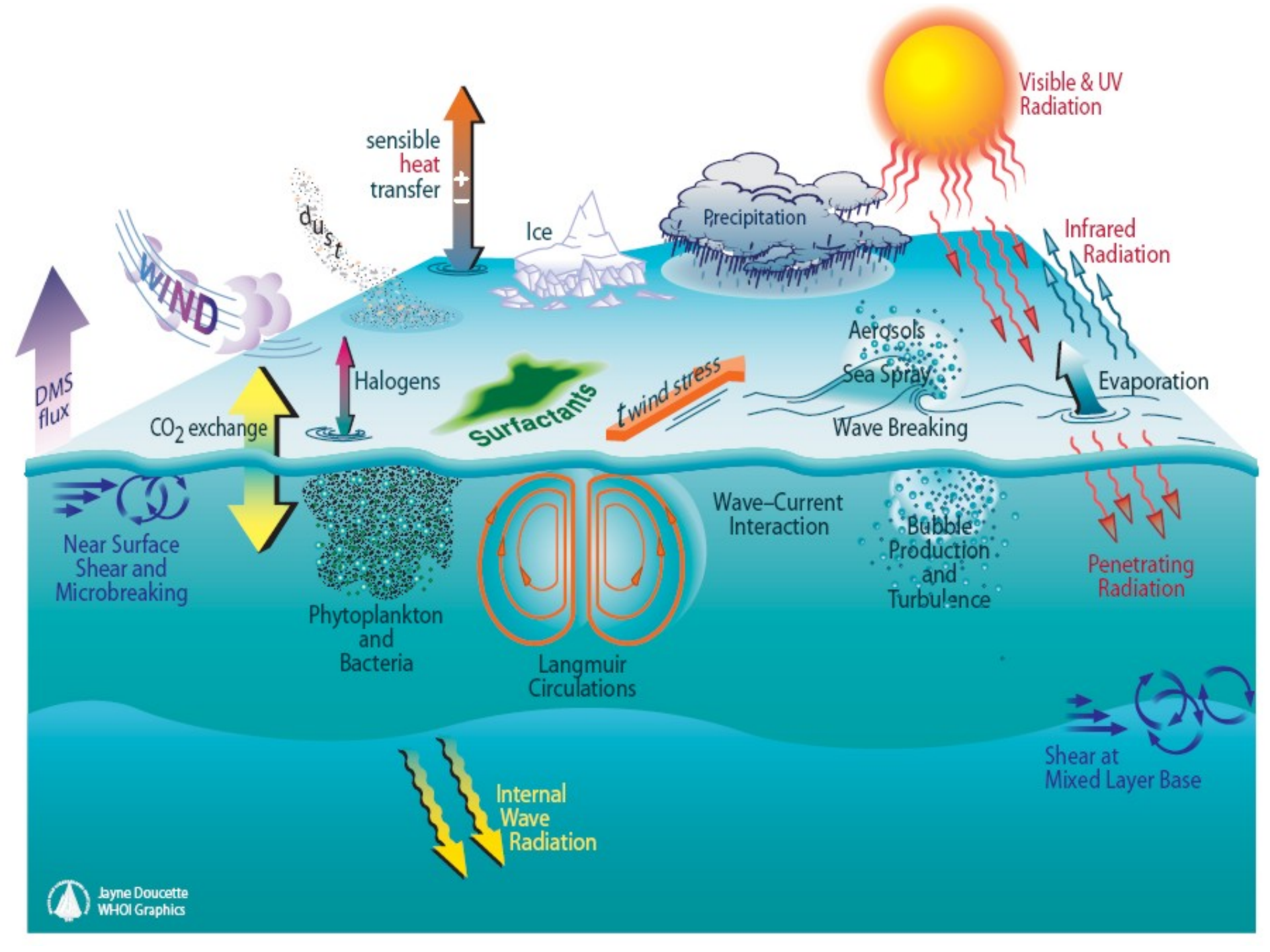


EARTH'S GLOBAL ENERGY BUDGET

BY KEVIN E. TRENBERTH, JOHN T. FASULLO, AND JEFFREY KIEHL

An update of the Earth's global annual mean energy budget is given in the light of new observations and analyses. Changes over time and contributions from the land and ocean domains are also detailed.

J.M.W. Turner 1805


Visible & UV Radiation
sensible heat transfer
+
−
dust
Ice
Precipitation
Infrared Radiation
WIND
DMS flux
Halogens
Aerosols
Sea Spray
Evaporation
CO_2 exchange
Surfactants
t wind stress
Wave Breaking
Near Surface Shear and Microbreaking
Phytoplankton and Bacteria
Langmuir Circulations
Wave–Current Interaction
Bubble Production and Turbulence
Penetrating Radiation
Shear at Mixed Layer Base
Internal Wave Radiation
Jayne Doucette
WHOI Graphics

Course Outline
ATMO/OCN665

I. Motivation
II. Basic Physics
III. Turbulence
IV. Boundary Layer Theory
V. Waves on the Interface
VI. Atmospheric Mixed Layer
VII. Ocean Mixed Layer
VIII. Gas Transfers
IX. Deep Convection
X. Storms
XI. Ocean Fronts

Course Outline
ATMO/OCN 665

Grading:

Term paper 50%
Contribution + Homework 50%

Course Outline
ATMO/OCN665

Materials:

ftp://ftp.soest.hawaii.edu/kelvin/OCN665/

First up: Turbulence