GLOBAL ENERGY AND WATER CYCLE EXPERIMENT (GEWEX)
AND
THE CONTINENTAL-SCALE INT'L PROJECT (GCIP)

DEBORAH VANE
Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California
The Complex Role of Water in Climate Processes

- Warmings
- Coolings

\[ \text{atmospheric vapor} \quad \text{evaporation} \]
\[ \text{clouds} & \text{aerosols} \quad \text{precipitation} \]
GEWEX
WCRP

RADIATION

BASELINE SURFACE RADIATION NETWORK (BSRN)

SURFACE RADIATION BUDGET PROJECT (SRB)

GEWEX WATER VAPOR PROJECT (GVAP)

CLOUD AND PRECIPITATION SYSTEMS

GLOBAL PRECIPITATION CLIMATOLOGY PROJECT (GPCP)

GLOBAL RUNOFF DATA CENTRE (GRDC)

INT'L SATELLITE LAND SURFACE CLIMATOLOGY PROJECT (ISLSCP)

GEWEX CONTINENTAL-SCALE INT'L PROJECT (GCIP)

HYDROMETEOROLOGY

GEWEX CLOUD SYSTEM STUDY (GCSS)

INT'L SATELLITE CLOUD CLIMATOLOGY PROJECT (ISCCP)
GCIP OBJECTIVES

- DETERMINE TIME/SPACE VARIABILITY OF HYDROLOGICAL CYCLE OVER A CONTINENTAL-SCALE REGION

- DEVELOP MACRO-SCALE HYDROLOGIC MODELS, COUPLED TO ATMOSPHERIC MODELS

- DEVELOP INFORMATION RETRIEVAL SCHEMES

- SUPPORT REGIONAL CLIMATE CHANGE IMPACT ASSESSMENT
GCIP STRATEGY: DEVELOPING COUPLED LAND-SURFACE/ATMOSPHERE MODELS
GCIP, GCSS, AMIP AND SCALE-INTERACTIVE MOIST PROCESSES

ATMOSPHERIC MODEL INTERCOMPARISON PROJECT (AMIP)

- CLIMATE/GCM INTERCOMPARISONS
- REGIONAL DISTRIBUTION AND NATURE OF CLIMATOLOGY ERRORS
- FOCUS ON "FAST" COMPONENT OF CLIMATE

GEWEX CONTINENTAL-SCALE INTERNATIONAL PROJECT (GCIP)

- COORDINATE WITH AMIP: REGIONAL SKILL OF GCMs vs MESO MODELS
- COORDINATE WITH GCSS: TEST GCSS-DEVELOPED MOIST PARAMETERS ON REGIONAL SCALE

GEWEX CLOUD SYSTEM STUDY (GCSS)

- MULTI-SCALE INVESTIGATIONS OF CLOUD PROCESSES JOINS OBSERVATIONS AND MODELS
- DEVELOP NEW CLOUD, CONVECTION PARAMETERS
- USE TRAILFINDER/ARM SITES AS MAJOR DATA SOURCE
GCIP DATABASE

REMOTELY SENSED DATA
RADAR PRECIPITATION (NEXRAD)
LONG AND SHORT-WAVE FLUX AT T.O.A.
SATellite AND AIRCRAFT VIS, IR AND WAVE
AVHRR NDVI
CLOUD CHARACTERISTICS
WATER VAPOR

GEOPHYSICAL DATA
HYDROLOGIC BOUNDARIES
STREAMS, TOPOGRAPHY
VEGETATION, LAND USE
SNOW COVER
ALBEDO
SOILS

DERIVED DATA FIELDS
NMC GRID POINT INITIALIZATIONS
PRECIPITATION
SOIL MOISTURE
EVAPOTRANSPIRATION
SURFACE FLUXES

IN-SITU DATA
SURFACE METEOROLOGICAL OBSERVATIONS
RADIOSONDES
RAIN GAUGES
WIND PROFILERS
RIVER RUNOFF
GCIP FIELD CAMPAIGNS

• FEW, FOCUSED
  -- TEST MODELS
  -- VALIDATE REMOTE SENSING DATA

• COOPERATIVE MULTISCALE EXPERIMENT
  SPRING/SUMMER '95 (CMESS)
  -- STUDY MESOSCALE CONVECTIVE SYSTEMS
     IN CENTRAL U.S.
  -- USWRP, DOE/ARM, FAA, GVAP, GCSS, GCIP

• 1996/97 (?)
  -- VALIDATE FLUX MODELS FORCED BY
     REMOTE SENSING AND IN-SITU DATA