Surface Spectral Albedo VAP

- Identify surface type (100% veg, 0% veg, partial veg, snow) from upward/downward-looking MFR obs

- Define a NDVI-type metric to determine %veg for partial veg cases

- Use piecewise continuous functions developed by Eli from spectral albedo libraries given surface type and MFR 5-channel albedos
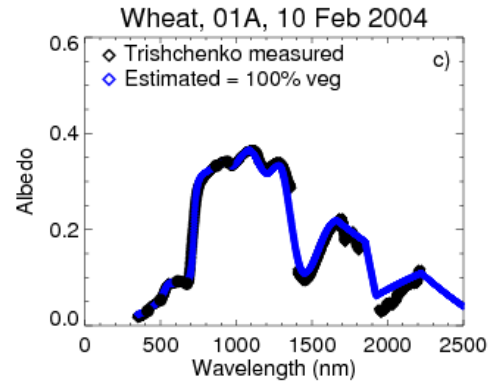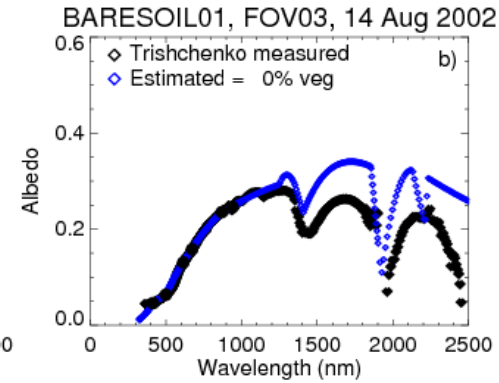
- Assess using spectral measurements during IOPs at SGP and by comparing integrated spectral to broadband albedo measurements

- Several years SGP data processed; currently fixing small bugs in qc then will release operationally

- Next steps:
  - Extend to NSA?
  - Revisit and promote idea of 1.6 um channel?
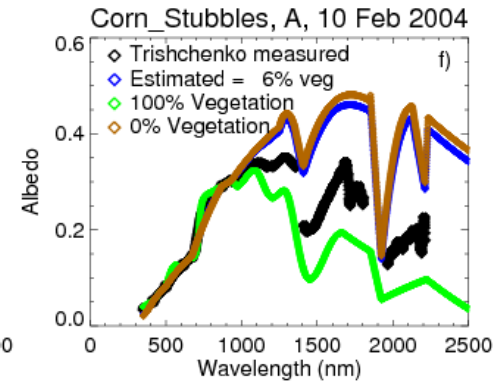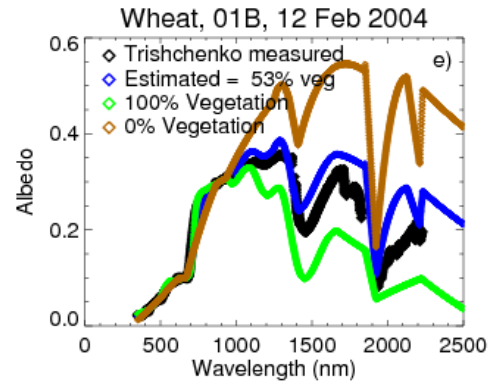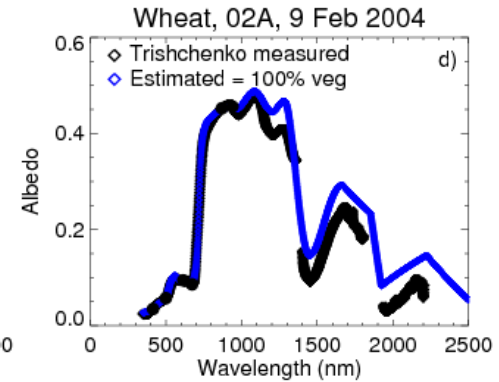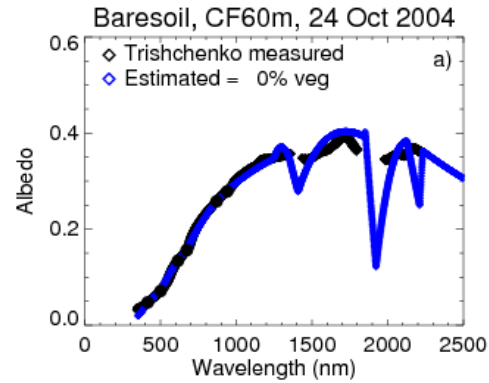
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                    ARM Measurements

   Cloud Properties    Surface albedo &      Aerosol        Radiative
                       Atmospheric state                     Fluxes


              Common time/height gridding; QC and source flags
              RIPBE_Inst (1-min)


   RIPBE_Avg (1-hour)     RRTM (or other RT model)


                    Heating Rate        Surface and TOA
                     Profiles              Fluxes


   CRMs, SCMs            ARCHIVE            Closure Studies
```
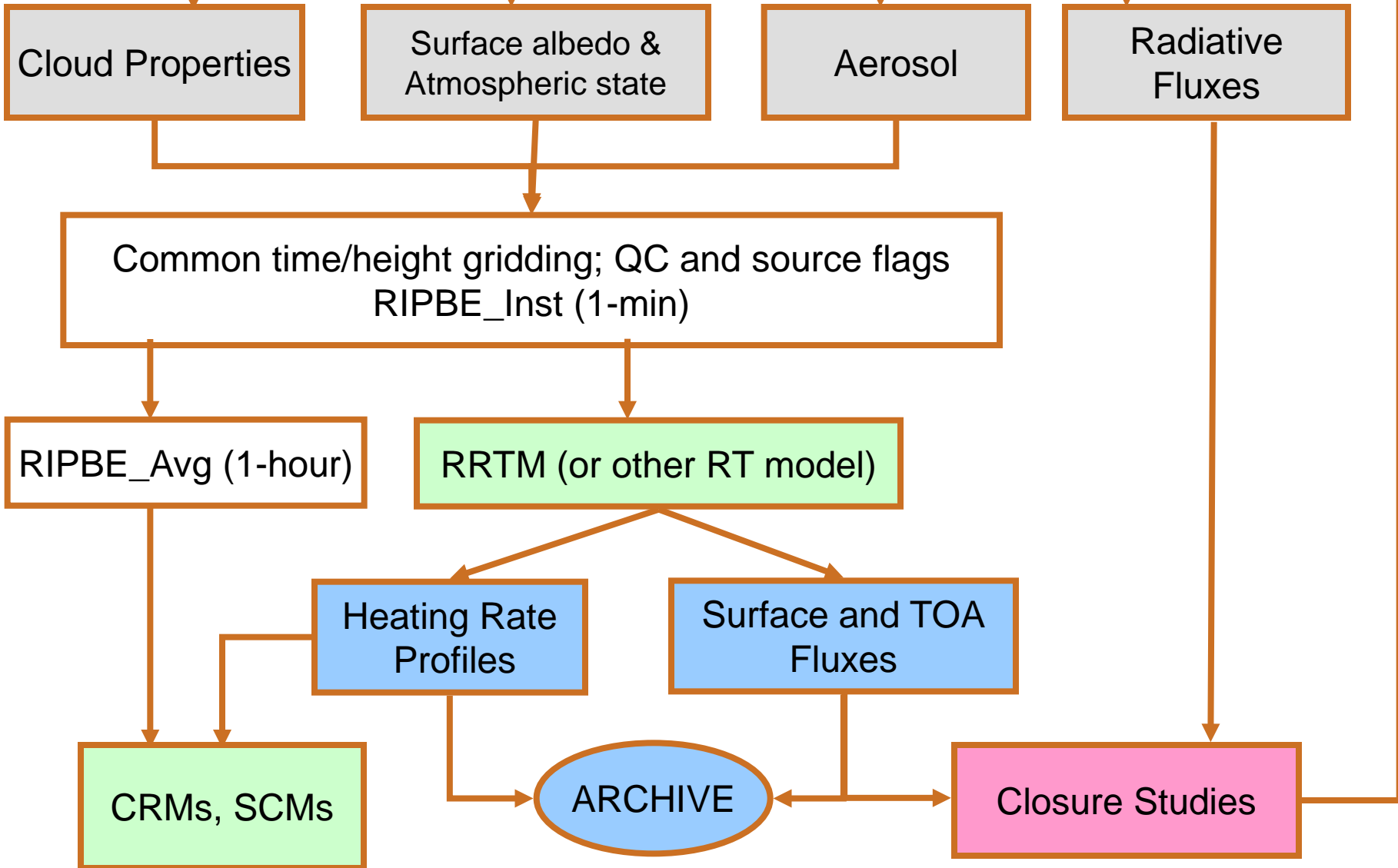
Radiatively Important Parameters Best Estimate (RIPBE)

► Combine all radiatively important parameters (water vapor, temperature ozone, surface albedo, aerosol and clouds) required to run a radiation code on a uniform vertical and temporal grid

► Requires multiple input VAPs, mostly only available at SGP at present

► Includes quality control (QC) and data source information on each variable

► Outcomes:

  ■ Provide a set of clearly defined, commonly gridded inputs for the Broadband Heating Rate Profile (BBHRP) project

  ■ Facilitate the use of BBHRP as a retrieval development testbed

  ■ Complement to the Climate Modeling Best Estimate (CMBE) VAP
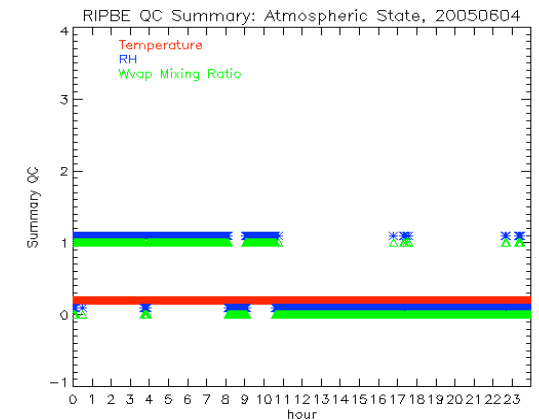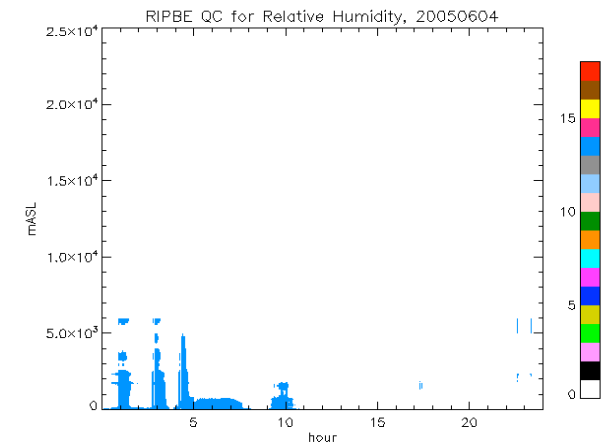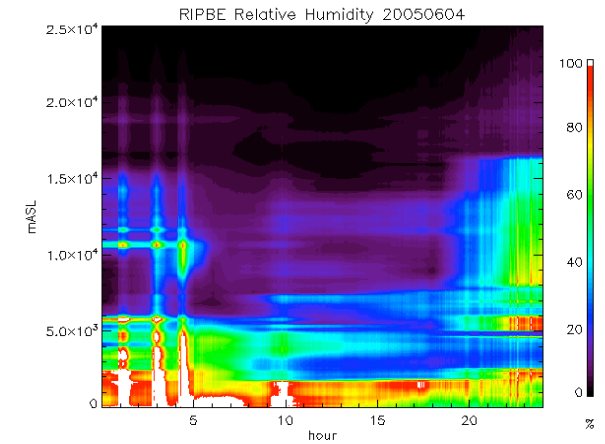
Current BBHRP Status

- ▶ Developed interface between RIPBE and RRTM
- ▶ Added qc flags on input and output
- ▶ Currently analyzing preliminary 1 year SGP run
- ▶ Next steps:
  - ▪ Create 30-min average file to assess closure
  - ▪ Consider interfaces for other models
  - ▪ Create test bed?
  - ▪ Implement options for cloud scattering properties?

sgpbbhrp2mlawer1C1.c1 for 20050507

lw_heating_rate (deg/dy)

max = 122.126
min = -276.574
mean = -1.224
stdev = 4.259

QC field for lw_heating_rate

QC Bit Number	
12	Disort beam-angle error; set nstreams=16 and reran RRTM
11	RRTM output missing band information
10	RRTM failed to produce valid output
9	RRTM run generated a runtime error or warning
8	RIPBE aerosol input had no non-zero extinction layers
7	RIPBE surface rad temp input had aqc_flag = Indeterminate
6	RIPBE sfcalb input had aqc_flag = Indeterminate
5	RIPBE species input had aqc_flag = Indeterminate
4	RIPBE aerosol input had aqc_flag = Indeterminate
3	RIPBE cloud input had aqc_flag = Indeterminate
2	RIPBE atmos state input had aqc_flag = Indeterminate
1	One or more RIPBE inputs had aqc_flag = bad

Date/Time (GMT)