

## The R/V Ron Brown Liquid Water Path Dataset:

Date: March 10, 2011

PI and contact person: Paquita Zuidema

RSMAS/MPO 4600 Rickenbacker Cswy

Miami, FL 33149

tel: 305-421-4276 fax: 305-421-4696

pzuidema@rsmas.miami.edu

LWPs are provided here at 30-second and 10-minute time resolution as two separate netcdf files. They cover the time span Oct. 22-Nov2 and again Nov. 11-Dec1. The ship location is included. The LWPs are calculated using radiances from a 2-channel 20-30 GHz radiometer only, following a physical retrieval updated from that of Zuidema et al. 2005, full reference given below. The radiometer for the VOCALS cruise was provided on loan from Dr. Peter Minnett, University of Miami. The datasets also include adiabatically-calculated LWP values that make use of the ceilometer-determined cloud base height and sonde-inferred (leg1) or radar-determined (leg2) cloud tops along with a liquid water condensation rate calculated from the cloud base temperature and pressure. The data quality is reasonably good, the standard measurement error for this physical retrieval approach is 10 g/m<sup>2</sup>. A slight absolute offset exists with the adiabatic LWP values, it is currently under investigation if this is because the radiometer values are too high or the adiabatic values (which depend on how the cloud boundaries are perceived) too low.

The use of this dataset is best acknowledged through citing the above reference and acknowledging the loan of the radiometer by Dr. Peter Minnett. A 2nd version of this dataset that also makes use of radiances from a 183 GHz radiometer is currently being worked on. For further information please contact Dr. Paquita Zuidema at [pzuidema@rsmas.miami.edu](mailto:pzuidema@rsmas.miami.edu).

The netcdf header files are given below:

```
netcdf vocals_rhb_lwp_v1 {
dimensions:
    time = 95040 ;
variables:
    float jd_jfrac(time) ;
        jd_jfrac:units = "julian day + day fraction, 30-sec res" ;
    float lwp(time) ;
        lwp:units = "g/m^2" ;
        lwp:description = "physically-retrieved following Zuidema et al. (2005,JGR)" ;
    float adlwp(time) ;
        adlwp:units = "g/m^2" ;
        adlwp:description = "lwps calculated solely from cloud boundaries+f(p,T)" ;
    float lat(time) ;
    float lon(time) ;

// global attributes:
    :source = "original file written by P Zuidema June 20 2009" ;
    :source2 = "lat and lons added Oct 11 2009" ;
    :description = "VOCALS 2008 cruise data oct 22-nov2 & nov 11-dec1" ;
    :version = "version 1. relies only on 23 and 31 Tbs" ;
```

```

for the file at 10-minute resolution:
netcdf vocals_rhb_lwp10min_v1 {
dimensions:
    time = 4752 ;
variables:
    float jd_jdfrac(time) ;
        jd_jdfrac:units = "julian day + day fraction, 10-min res,time marker at beginning" ;
    float lwp(time) ;
        lwp:units = "g/m^2" ;
        lwp:description = "physically-retrieved following Zuidema et al.2005,JGR" ;
        lwp:bad_value = "-99" ;
    float nlwp(time) ;
        nlwp:description = "number of 30 second samples contributing to 10min lwp ave" ;
    float adlwp(time) ;
        adlwp:units = "g/m^2" ;
        adlwp:bad_value = "-99" ;
        adlwp:description = "lwps calculated solely from cloud boundaries+f(p,T)" ;
    float lat(time) ;
    float lon(time) ;

// global attributes:
    :source = "original file written by P Zuidema June 20 2009" ;
    :source2 = "lat and lons added Oct 11 2009" ;
    :description = "VOCALS 2008 cruise data oct 22-nov2 & nov 11-dec1" ;
    :version = "version 1. relies only on 23 and 31 Tbs" ;

```

Zuidema, P., E. Westwater, C. Fairall and D. Hazen, 2005: Ship-based Liquid Water Path Estimates in Marine Stratocumulus. *J. Geophys. Res.*, **110**, D20206, doi:10.1029/2005JD005833