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Readme for summary files

The 1-min daily ASCII files *WHOTS_2011_proc_name_1min.txt* (name='met', 'rad', 'licor', 'son' or 'gpsnav'); are the composite files for the entire project written at 1min resolution. Most quantities given are subject to future modification based on accounting for other sources of data and revised calibrations.

Details:

- * name='met' refers to slow mean data (T/RH, PIR/PSP, etc)
- * name='rad' refers to all data related to PSP and PIR sensors
- * name='licor' refers to Licor sensor (CO2/H2O)
- * name='son' refers to sonic measurement on the bow tower
- * name='gpsnav' refers to the PSD navigation data from GPS units.

The data columns are not labeled so they can be directly acquired with a MATLAB 'load' statement.

The columns for files *WHOTS_2011_proc_met_1min.txt* are as follow:

```
jdy=x(:,1);           % Day-Of-Year at beginning of time average
pir=x(:,2);           % averaged downward IR flux between Eppley unit and K&Z
unit (W/m^2)
psp=x(:,3);           % averaged downward solar flux between Eppley unit and
K&Z unit (W/m^2)
Tc1=x(:,4);           % case temperature of PIR Eppley unit on bridge (C)
Td1=x(:,5); );        % dome temperature of PIR Eppley unit on bridge (C)
Tsea=x(:,6)           % sea snake temperature (C)
Tvais=x(:,7);         % air temperature(C)
Rhvais=x(:,8);        % Relative Humidity (%)
org=x(:,9);           % rainrate, STI optical rain gauge, uncorrected (mm/hr)
org_carrier =x(:,10); % rain gauge function (V)
aspir_on=x(:,11);     % backflow indicator for RH/T sensor (V).
press=x(:,12);        % atmospheric pressure (mb)
Tc3=x(:,13);          % case temperature of PIR Eppley unit on 2nd deck (C)
Td3=x(:,14); );       % dometemperature of PIR Eppley unit on 2nd deck (C)
```

The columns for files *WHOTS_2011_proc_rad_1min.txt* are as follow:

```
jdy=x(:,1);           % Day-Of-Year at beginning of time average
pir1=x(:,2);          % downward IR flux from Eppley unit on bridge (W/m^2)
pir2=x(:,3);          % downward IR flux from K&Z unit on bridge (W/m^2)
psp1=x(:,4);          % downward solar flux from Eppley unit on bridge (W/m^2)
psp2=x(:,5);          % downward solar flux from K&Z unit on bridge (W/m^2)
Tc1=x(:,6);           % case temperature of PIR Eppley unit (C)
Td1=x(:,7);           % dome temperature of PIR Eppley unit (C)
Tkz=x(:,8);           % temperature of PIR K&Z unit (C)
Tvais=x(:,9);         % air temperature(C)
Rhvais=x(:,10);       % Relative Humidity (%)
Tsea=x(:,11);         % sea snake temperature(C)
```

```

pir3=x(:,12);      % downward IR flux from Eppley unit on 2nd deck (W/m2)
psp3=x(:,13);      % downward solar flux from Eppley unit on 2nd deck (W/m2)

```

The columns for files *WHOTS_2011_proc_licor_1min.txt* are as follow:

```

jdy=x(:,1);        % Day-Of-Year at beginning of time average
Licor_H2O=x(:,2);  % Specific humidity (g/kg)
Licor_CO2=x(:,3);  % Licor CO2 (umol/mol)
Licor_Tempi=x(:,4); % Licor temperature (degC)
Licor_Pressi=x(:,5); % Licor pressure (hPa)
Licor_agci=x(:,6); % Livor AGC value (%)

```

The columns for files *WHOTS_2011_proc_son_1min.txt* are as follows:

```

jdy=x(:,1);        % Day-Of-Year at beginning of time average
U=x(:,2);          % Relative u wind component (+boward) , m/s
V=x(:,3);          % Relative v wind component (+portward) , m/s
W=x(:,4);          % Relative w wind component (+up) , m/s
Tsonic=x(:,5);     % sonic temperature, C
dir =x(:,6)        % Relative wind direction (from),clockwise relative to ship's
bow, deg

```

The columns for files *WHOTS_2011_proc_gpsnav_1min.txt* are as follow:

```

jdy=x(:,1);        % Day-Of-Year at beginning of time average
gpslat1i=x(:,2);   % decimal latitude, deg
gpslon1i=x(:,3);   % decimal longitude, deg
gpsspeedi=x(:,4);  % GPS SOG, m/s
gpsheadi=x(:,5);   % GPS COG, deg
headxi_pitch=x(:,6); % Crescent GPS heading, deg
pitchxi_pitch=x(:,7); % Crescent GPS angle (pitch), deg

```

A second set of programs reads the daily 1-min text files; time matches the various data sources, averages them to 5 or 30 minutes, computes fluxes, and writes new daily flux files. The 5-min and 30-min daily flux files have been combined and rewritten as a single file to form the file *WHOTS_2011_PSD_flux_5min_all.txt* and *WHOTS_2011_PSD_flux_30min_all.txt*.

The column assignment for those files is as follow:

```

jdy=x(:,1);        %Day-Of-Year at beginning of time average
slt1=x(:,2);       %psd bow true wind speed, m/s
dir1t1=x(:,3);     %psd bow true wind direction, deg
ts=x(:,4);         %psd seasnake T, C
ts_tsg=x(:,5);     %ship thermosalinograph T, C bow (NaN is not available)
sal_tsg=x(:,6);    %ship thermosalinograph salinity, psu bow (NaN is not
available)
ta=x(:,7);         %psd air T, C
qs=x(:,8);         %psd air specific humidity at sea surface, g/kg
qa=x(:,9);         %psd air specific humidity, g/kg
psp=x(:,10);       %psd solar flux, w/m2
pir=x(:,11);       %psd IR flux, w/m2
org=x(:,12);       %psd optical raingage precip rate, mm/hr
sogm5=x(:,13);     %SOG from gps, m/s
cogm5=x(:,14);     %COG from gps, deg
relsp1=x(:,15);    %relative bow wind speed, m/s
reldir1=x(:,16);   %relative bow wind direction, deg
lat=x(:,17);       %decimal latitude, deg

```

```

lon=x(:,18);      %decimal longtude, deg
zt=x(:,19);      %Depth of SST sensor used in heat flux calc, m
sig_sp=x(:,20);  %standard deviation of ship speed, m/s
taub=x(:,21);   %wind stress, coare 3.0, N/m^2
hsb=x(:,22);    %sensible heat flux, coare 3.0, w/m^2
hlb=x(:,23);    %latent heat flux, coare 3.0, w/m^2
rf=x(:,24);     %rain heat flux, w/m^2
ta_im=x(:,25);  %IMET air t, C from RTD (NaN if not available)
qa_im=x(:,26);  %IMET air specific humidity from RTD, g/kg (NaN if not
available)
s_shp1=x(:,27); %ship port true wind speed, m/s (NaN if not available)
dir_shp1=x(:,28); %IMET port true wind direction, deg (NaN if not available)
psp_im=x(:,29); %IMET solar flux, w/m^2 (NaN if not available)
pir_im=x(:,30); %IMET IR flux, w/m^2 (NaN if not available)
pressm=x(:,31); %Barometric pressure, mb
rh_psd=x(:,32); %RH (%)

```

Finally, below are reference heights (with respect to water line) of the sensors used in the WHOTS2011 experiment.

Sensor	Sampling rate	Height (m)
Bow sonic	10 Hz	18
Motion Pack	10 Hz	17.8
ORG	0.1Hz, averaged to 1 sample/min	16.4
T/RH	0.1Hz, averaged to 1 sample/min	16.1
Licor (CO2&H2O)	10 Hz	16.6
Radiometers (top wheelhouse)	0.1Hz, averaged to 1 sample/min	14.5
Barometer	0.1Hz, averaged to 1 sample/min	12
SST	0.1Hz, averaged to 1 sample/min	-0.05 to -0.10

Table 1.1. PSD sensor heights and sampling rates.