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Readme for summary files

The 1-min daily ASCII files *WHOTS2009_proc_name_1min_all.txt* (name='pc', 'rad', 'KMscs', 'sonic1_bow' or 'sonic2_bridge'; 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='pc' refers to slow mean data (T/RH, PIR/PSP, etc)
* name='rads' refers to all data related to PSP and PIR sensors
* name=' KMscs' refers to ship data system
* name='sonic1_bow' refers to sonic measurement on the bow tower
* name= 'sonic2_bridge' refers to sonic measurement on the ship's bridge.
* 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 *WHOTS2009_proc_pc_1min_all.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 (C)
Td1=x(:,5); );          % dome temperature of PIR Eppley unit (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)
```

The columns for files *WHOTS2009_proc_rads_1min_all.txt* are as follow:

```
jdy=x(:,1);        % Day-Of-Year at beginning of time average
pir1=x(:,2);       % downward IR flux from Eppley unit (W/m^2)
pir2=x(:,3);       % downward IR flux from K&Z unit (W/m^2)
psp1=x(:,4);       % downward solar flux flux from Eppley unit (W/m^2)
psp2=x(:,5);       % downward solar flux flux from K&Z unit (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)
```

The columns for files *WHOTS2009_proc_KMscs_1min_all.txt* are as follow:

```
jdy=x(:,1);              % Day-Of-Year at beginning of time average
KMlati=x(:,2);           %decimal latitude, deg
KMloni=x(:,3);           %longitude, deg
KMcogi=x(:,4);           % pcode cog, deg
KMsogi=x(:,5);           % pcode sog, m/s
KMheadingi=x(:,6);       %POSMV heading, deg
KMrolli=x(:,7);          %deg
KMpitchi=x(:,8);         %deg
KMheavei=x(:,9);         %m
KMstw_stwi=x(:,10);      %speed trough water, m/s
KMrhi=x(:,11);           %rel hum,%  from RTD
KMtai=x(:,12);           %air t, C   from Rotronic sensor
KMrtdtempi=x(:,13);      %air t, C  from RTD
KMpressi=x(:,14);        %barometric pressure (mbar)
KMpspi=x(:,15);          %solar flux, w/m^2
KMpiri=x(:,16);          %imet ir, w/m^2
KMorgi=x(:,17);          %rain, mm/hr
KMwind1_imui=x(:,18);    %imet port true wind speed, m/s
KMwind1_imdi=x(:,19);    %imet port true wind dir, deg
KMwind2_imui=x(:,20);    %imet stbd true wind speed, m/s
KMwind2_imdi=x(:,21);    %imet stbdtrue wind dir, deg
KMuthsl_tsgi=x(:,22);    %thermosalinograph T, C
KMuthsl_tssi=x(:,23);    %salinity, psu
KMuthsl_condi=x(:,24);   %Conductivity, Siemens/m
KMdepth120i=x(:,25);     %Depth, 20-800/m
KMdepth1002i=x(:,26);    %Depth, 700-7000/m
KMsimrad_heighti=x(:,27);%Height/Elevation (m)
```

The columns for files *WHOTS2009_proc_sonic1_bow_1min_all.txt and WHOTS2009_proc_ sonic2_bridge_1min_all.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 rel ship's bow,
deg
```

The columns for files *WHOTS2009_proc_ gpsnav_1min_all.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
pitchxi_roll=x(:,8);  %Crescent GPS angle (roll), 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 *WHOTS2009_PSD_flux_5min_all.txt* and *WHOTS2009_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
s1t1=x(:,2);      %psd bow true wind speed, m/s
dir1t1=x(:,3);    %psd bow true wind direction, deg
s1t2=x(:,4);      %psd bridge true wind speed, m/s
dir1t2=x(:,5);    %psd bridge true wind direction, deg
relsp1=x(:,6);    %rel bow wind speed, m/s
reldir1=x(:,7);   %rel bow wind direction, deg
relsp2=x(:,8);    %rel bridge ind speed, m/s
reldir2=x(:,9);   %rel bridge wind direction, deg
ts=x(:,10);       %psd seasnake T, C
ta=x(:,11);       %psd air T, C
qs=x(:,12);       %psd air specific humidity at sea surface, g/kg
qa=x(:,13);       %psd air specific humidity, g/kg
psp=x(:,14);      %psd solar flux, w/m^2
pir=x(:,15);      %psd IR flux, w/m^2
org=x(:,16);      %psd optical raingage precip rate, mm/hr
rh_etl=x(:,17);   %RH (%)
lat=x(:,18);      %ship decimal latitude, deg
lon=x(:,19);      %ship decimal longtude, deg
sogm5=x(:,20);    %ship sog from gps, m/s
cogm5=x(:,21);    %ship cog from gps, m/s
shp_spd=x(:,22);  %ship speed trough water, m/s
shp_hed=x(:,23);  %ship heading from gyrocompass, deg
ta_im=x(:,24);    %ship air temp, C
qa_im=x(:,25);    %ship air specific humidity, g/kg
s_shp1=x(:,26);   %ship port true wind speed, m/s
dir_shp1=x(:,27); %ship port true wind direction, deg
s_shp2=x(:,28);   %ship stbd true wind speed, m/s
dir_shp2=x(:,29); %ship stbd true wind direction, deg
psp_im=x(:,30);   %ship solar flux, w/m^2
pir_im=x(:,31);   %ship IR flux, w/m^2
pressm=x(:,32);   %ship BP, mb
ts_tsg=x(:,33);   %ship thermosalinograph T, C  bow
sal_tsg=x(:,34);  %ship thermosalinograph salinity, psu  bow
cond_tsg=x(:,35); %ship thermosalinograph conductivity, Siemens/m
zt=x(:,36);       %Depth of SST sensor used in heat flux calc, m
sig_sp=x(:,37);   %standard deviation of ship speed, m/s
taub=x(:,38);     %wind stress, coare 3.0, N/m^2
hsb=x(:,39);      %sensible heat flux, coare 3.0, w/m^2
hlb=x(:,40);      %latent heat flux, coare 3.0, w/m^2
rf=x(:,41);       %rain heat flux, w/m^2
usr=x(:,42);      %friction velocity, m/s
```

Finally, below are reference heights of the sensors used in these data sets.

Sensor	Sampling rate	Height (m)
Bow sonic	10 Hz	17.4
Bridge sonic	10 Hz	21.3
Motion Pack	10 Hz	17.2
ORG	0.1Hz, averaged to 1 sample/min	15.7
T/RH	0.1Hz, averaged to 1 sample/min	14.7
Licor (CO2&H2O)	10 Hz	16.6
Radiometers	0.1Hz, averaged to 1 sample/min	14.4
Barometer	0.1Hz, averaged to 1 sample/min	13.3
SST	0.1Hz, averaged to 1 sample/min	-0.05 to -0.10

Table 1.1. PSD sensor heights and sampling rates.

Sensor	Available data rate	Height (m)
Anemometer	0.5Hz	21.4
ORG	1Hz	20.7
T/RH	1Hz	19.7
RTD	1Hz	20.1
Radiometers	1Hz	21.2
Barometer	1Hz	4.8
SST (uthsl)	1Hz	-7.0
POSMV	1Hz	--

Table 1.2. KM sensor heights and available data rates.