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| National Park Service  U.S. Department of the Interior  Pacific Island Network |  |

Standard Operation Procedure:

Processing Water Quality Sampling Event Files

Version 1.11

Change History

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| --- | --- | --- | --- | --- | --- |
| New Version # | Revision Date | Author | Changes Made | Reason for Change | Previous Version # |
| 1.1 | 8/10/2017 | Kelly Kozar, Kimberly Weisenborn | Updated Datasheets, YSI files and Images instructions. Added instructions for calibration and dive logs. | To include more details into the steps needed for processing water quality data files. | 1.00 |
| 1.11 | 7/18/18 | Kelly Kozar | Minor edits to instructions. | To be more clear in instrutions. | 1.1 |
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Only changes in this specific SOP will be logged here. Version numbers increase incrementally by hundredths (e.g., version 1.01, version 1.02) for minor changes. Major revisions should be designated with the next whole number (e.g., version 2.0, 3.0, 4.0). Record the previous version number, date of revision, author of the revision, identify paragraphs and pages where changes are made, who approved the revision, and the reason for making the changes along with the new version number.

Recommended Citation:

Pacific Island Network (PACN). 2014. Processing Water Quality Sampling Event Files. Pacific Island Network, National Park Service. Hawaii National Park, HI.

Purpose

This standard operation procedure describes how to process field datasheets, calibration and dive logs, chain of custody forms, YSI files, images, and GPS files that were created during a water quality sampling event. Files are grouped by type, but the first step upon returning from a water quality sampling event is to upload all raw files to the I drive in the appropriate folder (stated in the steps below). *Do not wait to upload these files, do it immediately after a sampling event.*

In all text below, in the folder designation text, “YYYY” refers to the sampling year in which the sampling event took place and “PARK” refers to the 4-letter park abbreviation code.

Datasheets

* Scan field datasheets as PDFs:
  + Ensure that the PDFs are readable after scanning them in
    - Check after a few of the PDFs are scanned
    - Adjust the brightness so that the text shows up darker
* Name the field datasheet PDFs:
  + Combine the stations into one PDF
    - YYYYMMDD\_PARK\_WQ\_StationType
      * Date Stamp (YYYYMMDD) – the date of the first day of the sampling event
      * PARK – Park abbreviation
        + ALKA
        + AMME
        + HALE
        + KAHO
        + KALA
        + NPSA
        + PUHE
        + PUHO
        + WAPA
      * Protocol Abbreviation:
        + WQ = Water Quality
      * Station Type Abbreviations:
        + ap = anchialine pool
        + bb = brackish body
        + fw = freshwater (for KALA, will include FKALA05\_bb site as well)
        + gw = groundwater
        + mr = marine
    - *Examples: 20150617\_WAPA\_WQ\_mr.pdf, 20150218\_ALKA\_WQ\_ap.pdf*
  + Order the datasheets by Station ID within the PDF, starting with fixed stations.
* Upload field datasheets to I drive:
  + I:\vital\_signs\13\_water\_quality\Data\Raw\_Data\1\_Field\_datasheets\YYYY\PARK folder
* Update the Water Quality Data log
  + Enter initials in the “Datasheet Scanned and Copied to I drive” column

Calibration/Dive Logs

* Scan the sampling event calibration and dive logs (if marine sampling) as PDFs:
  + Ensure that the PDFs are readable after scanning them in
  + Check after a few of the PDFs are scanned
    - Adjust the brightness so that the text shows up darker
* Name the calibration and dive log PDFs:
  + Each log should be combined into one PDF
    - YYYYMMDD\_PARK\_WQ\_StationType\_TYPE\_log
      * Date Stamp (YYYYMMDD) – the date of the first day of the sampling event
      * PARK – Park abbreviation
        + ALKA
        + AMME
        + HALE
        + KAHO
        + KALA
        + NPSA
        + PUHE
        + PUHO
        + WAPA
      * Protocol Abbreviation:
        + WQ = Water Quality
      * Station Type Abbreviations:
        + ap = anchialine pool
        + bb = brackish body
        + fw = freshwater (for KALA, will include FKALA05\_bb site as well)
        + gw = groundwater
        + mr = marine
      * TYPE – The type of log
        + Calibration
        + Dive
    - *Examples: 20150617\_WAPA\_WQ\_mr\_Dive\_log.pdf, 20150218\_ALKA\_WQ\_ap\_Calibration\_log.pdf*
* Upload scanned logs to I drive:
  + I:\vital\_signs\13\_water\_quality\Data\Raw\_Data\1\_Field\_datasheets\YYYY\PARK \Logs folder
* Update the Water Quality Data log
  + Enter initials in the “Calibration and Dive Logs Scanned and Copied to I drive” column

Chain of Custody Forms (COC) for lab samples

* Scan COC form as PDFs
  + Ensure that the PDFs are readable after scanning them in
  + Check after a few of the PDFs are scanned
    - Adjust the brightness so that the text shows up darker
* Name the COC forms
  + YYYYMMDD\_PARK\_StationType\_COC
    - Date Stamp (YYYYMMDD) – the date of the first day of the sampling event
    - PARK – Park abbreviation
      * ALKA
      * AMME
      * HALE
      * KAHO
      * KALA
      * NPSA
      * PUHE
      * PUHO
      * WAPA
    - Station Type Abbreviations:
      * ap = anchialine pool
      * bb = brackish body
      * fw = freshwater (for KALA, will include FKALA05\_bb site as well)
      * gw = groundwater
      * mr = marine
    - *Examples: 20170317\_KAHO\_ap\_COC. PDF or 20170608\_WAPA\_mr\_COC.PDF*
* Upload the COC forms to the I drive
  + I:\vital\_signs\13\_water\_quality\Data\Raw\_Data\2\_COCs\YYYY\PARK
* Update the Water Quality Data log
  + Enter initials in the “Chain of Custody form” column

YSI Files

* Download data off the YSI sonde:
  + Refer to instructions in the document –   
    I:\vital\_signs\13\_water\_quality\Data\Database\Database\_documentation\SOP\_WQ\_YSI\_file\_processing.docx
* Create a sampling event folder for the raw YSI files:  
  I:\vital\_signs\13\_water\_quality\Data\Raw\_Data\3\_YSI\YYYY\PARK\**YYYYMMDD\_PARK\_[Island]\_TYPE\_YSI\_raw**
  + Folder Naming Convention:
    - YYYYMMDD = the date stamp is the first date of the sampling date where there are multiple dates sampled.
    - PARK = 4 letter park code
    - [Island] – For NPSA only, add the island the sampling was conducted on
      * Tut – Tutuila
      * Tau – Tau
      * Ofu - Ofu
    - TYPE = between PARK and YSI, put the type of water quality site these YSI files are for.
      * ap = anchialine pool
      * bb = brackish body
      * fw = freshwater (for KALA, the freshwater sampling event folder will include FKALA05\_bb site as well, even though it’s a brackish site)
      * gw = groundwater
      * mr = marine
* Move the .dat files (YSI6600 sonde) or .bin (YSIEXO2 sonde) files to the sampling event folder
* Name YSI files (.dat or .bin extension)—short names (5 letter site names) are fine for .dat or .bin files.
* Process the YSI .dat files using Ecowatch Lite and the .bin files using KOR-EXO software
  + Refer to instruction in the document I:\vital\_signs\13\_water\_quality\Data\Database\Database\_documentation\SOP\_WQ\_YSI\_file\_processing.docx
  + Export data as a .csv file (Ecowatch Lite and KOR-EXO) to the same sampling event folder as the .dat or .bin file
* Rename the files to “YYYYMMDD\_Station\_ID\_YSI\_raw”.
  + The date stamp for YSI files is the actual date the station was sampled. There may be multiple dates sampled within the folder.
  + For fixed stations, the Station ID should match the Station ID in the database. This includes the station type (ex: FKALA01\_mr, FHALE01\_fw, FKAHO01\_ap, FPUHE01\_bb, etc.).
  + For temporary stations, use the same format as for fixed stations. This will not match what is in the database, but the temporary station names do not need to include date stamp in station name for YSI files since the date is part of the file name (ex: TKALA05\_mr, THALE01\_fw, TKAHO04\_ap, etc.).
  + For marine files, include a suffix with depth (i.e. ‘sur’ (for surface) or ‘btm’ (for bottom)).
  + For YSI6600 files, change the extension from .csv to .txt to convert to text file. This will not corrupt the file, so disregard any warning messages.
* Create a sampling event folder for the clean YSI files:  
  I:\vital\_signs\13\_water\_quality\Data\Raw\_Data\3\_YSI\YYYY\PARK\**YYYYMMDD\_PARK\_[Island]\_TYPE\_YSI\_clean** 
  + Folder Naming Convention:
    - YYYYMMDD = the date stamp (YYYYMMDD) is the first date of the sampling date where there are multiple dates sampled.
    - PARK = 4 letter park code
    - [Island] – For NPSA only, add the island the sampling was conducted on
      * Tut – Tutuila
      * Tau – Tau
      * Ofu - Ofu
    - TYPE = between PARK and YSI, put the type of water quality site these YSI files are for.
      * ap = anchialine pool
      * bb = brackish body
      * fw = freshwater (for KALA, the freshwater sampling event folder will include FKALA05\_bb site as well, even though it’s a brackish site)
      * gw = groundwater
      * mr = marine
  + Copy the renamed raw .txt (6600) and .csv files (EXO2) to this clean folder.
    - Rename the raw .txt or .csv file to clean
      * Change from “YYYYMMDD\_Station\_ID\_YSI\_**raw**” to “YYYYMMDD\_Station\_ID\_YSI\_**clean**”
  + Contains only text files with the following modifications (made manually):
    - Marine text or .csv files should be ‘clipped’ to only include a single site per file.
    - The data within each file should be reviewed. Readings that were taken prior to deployment into the water resource or after removal from the water, or were recorded while the instrument was stabilizing (usually the first 1-2 readings) can be removed. Review pH data closely, as it usually takes longest to stabilize.
    - For files exported from Ecowatch Light only - There must be one blank line between the header information (parameters/ units) and the data. When the file is imported, if this space is not included in the file, the first line of recordings will be cut-off. (NOTE: When the file is imported, the header is removed from the file).
    - There should be no spaces after the last digit of data at the end of the text file (if so, delete all spaces after this last digit. If there is a ‘blank line’ of data, there will be an error message when the file is imported.
* Put a copy of the YSI clean folder to the Database folder**:**I:\vital\_signs\13\_water\_quality\Data\Database\YSI\_files folder
  + Be sure to import these files to the database and not the YSI files in the WQ\_Raw\_Data\3\_YSI\ folder as the header will be removed upon import.
* Update the Water Quality Data log:
  + Enter initials in the “Export YSI Files to Raw folder”, “Process YSI in Ecowatch or KOR”, “Export YSI File to TXT or CSV Files (Clean folder)”, “Clip extraneous data”, and “Copy into Database YSI\_files Folder” columns

Images

* Create a sampling event folder for the images:
  + Ricoh Images – images taken with the Ricoh camera
    - I:\vital\_signs\13\_water\_quality\Images\YYYY\PARK\Ricoh\_camera\YYYYMMDD
      * YYYYMMDD = the date stamp is the first date of the sampling date where there are multiple dates sampled.
  + Non-Ricoh Images – images taken with a camera other than the Ricoh
    - I:\vital\_signs\13\_water\_quality\Images\YYYY\PARK\Originals\ **YYYYMMDD**
      * YYYYMMDD = the date stamp is the first date of the sampling date where there are multiple dates sampled.
* Upload images to the sampling event folder in the Originals (Non-Ricoh camera images) or Ricoh\_camera folder (Ricoh camera images).
* Rename images:
  + Non-Ricoh camera
    - Copy the sampling event folder that was created in the Originals folder to the Data folder
      * I:\vital\_signs\13\_water\_quality\Images\YYYY\PARK\Data
    - Rename images in the format: **YYYYMMDD\_StationID\_WQ\_TYPE\_Direction**.jpg  
      (i.e. 20130115\_FHALE05\_fw\_WQ\_FW\_Downstream.JPG)
      * YYYYMMDD: the date stamp for images is the actual date the station was sampled.
      * StationID: for fixed stations, the Station ID should match the Station ID in the database. This includes the station type (i.e. FKALA01\_mr, FHALE01\_fw, FKAHO01\_ap, FPUHE01\_bb, etc.)
      * WQ: an abbreviation that stands for “water quality”, and is a constant that should be in the naming of all water quality image names
      * TYPE:
        + AP = anchialine pool
        + BB = brackish body
        + FW = fresh water
        + GW = ground water
        + MR = marine
      * Direction: if there are any duplicates of these photos add a prefix of “\_#” (i.e. Downstream\_1, Downstream\_2)
        + For freshwater images:

Site

Downstream

Left\_Bank

Right\_Bank

Upstream

* + - * + For anchialine pool and brackish body images:

Site

North

South

East

West

* + - * + For marine images:

Site

0\_degrees

90\_degrees

180\_degrees

270\_degrees

* + Ricoh camera
    - Copy the sampling event folder in the Ricoh folder to your personal (C:\) drive for processing
    - Process using the instructions in the document I:\vital\_signs\13\_water\_quality\Data\Database\Database\_documentation\ SOP\_Processing\_photos\_GeoJot+Core\_v1.2.docx
    - Move the processed images back to the I:\ drive following instructions in the SOP
    - Copy the tagged images to the Data folder following instructions in the SOP
      * I:\vital\_signs\13\_water\_quality\Images\YYYY\PARK\Data
    - Use Bulk Rename Utility program to remove the “\_tag” suffix at the end of each image file name.
* Database images folder
  + Copy the sampling event folder in the Data folder to the Database\_images folder
    - I:\vital\_signs\13\_water\_quality\Data\Database\Database\_images\2\_Sampling\_event\_images\YYYY\PARK
      * These images will be linked to the database
* Update the Water Quality Data log
  + Enter initials in the “Upload photos from camera”, “Rename Files”, and “Copy into Database Image Folder” columns

GPS Files

* Download Waypoints taken during a sampling event
  + I:\vital\_signs\13\_water\_quality\Spatial\_info\YYYY\GPS\PARK
    - Create folder for sampling event
      * YYYYMMDD\_PARK\_ StationType \_GPS\_pts\_used
    - Date Stamp (YYYYMMDD) – the date of the first day of the sampling event
    - PARK – Park abbreviation
      * ALKA
      * AMME
      * HALE
      * KAHO
      * KALA
      * NPSA
      * PUHE
      * PUHO
      * WAPA
    - Station Type Abbreviations:
      * ap = anchialine pool
      * bb = brackish body
      * fw = freshwater (for KALA, will include FKALA05\_bb site as well)
      * gw = groundwater
      * mr = marine
    - *Examples: 20170115\_HALE\_fw\_GPS\_pts\_used or 20170428\_KALA\_mr\_GPS\_used*
  + Copy any GPS files into the folder, naming the files the same as the folder, and adding the extension “\_#” for multiple files.
    - *Examples: 20170115\_HALE\_fw\_GPS\_pts\_used\_1 and 20170115\_HALE\_fw\_GPS\_pts\_used\_2*
  + The GPS coordinates in these files are used in the database for temporary stations
* Update the Water Quality Data log
  + Enter initials in the “Upload GPS files to I drive” column

Appendix A: Water Quality Files Processing Checklist

Name: Click here to enter text.

Park: Click here to enter text.

Sampling Event Start Date: Click here to enter text.

Datasheets

Scan field datasheets as PDFs

Name the field datasheet PDFs

Upload field datasheets to I drive

Update the Water Quality Data log

Calibration/Dive Logs

Scan logs as PDFs

Name the log PDFs

Upload logs to I drive

Update the Water Quality Data log

Chain of Custody Forms (COC) for lab samples

Scan COC form as PDFs

Name the COC forms

Upload the COC forms to the I drive

Update the Water Quality Data log

YSI Files

Download data off the YSI sonde

Create sampling event folder on I drive

Copy the .dat or .bin files to the sampling event folder

Name YSI files (.dat or .bin extension)

Process the YSI .dat files (Ecowatch Lite) or .bin files (KOR-EXO)

Make a copy of the .csv or .txt file

Create a folder for the clean YSI files

Copy the YSI clean folder to the Database folder

Update the Water Quality Data log

Images

Create a sampling event folder for the images

Upload images to the sampling event folder in the Originals or Ricoh folder

Rename images

Copy the sampling event folder in the Data folder to the Database images folder

Update the Water Quality Data log

GPS/GIS Files

Download Waypoints taken during a sampling event

Create folder for sampling event

Add GPS files and rename

Update the Water Quality Data log