Tracking Optical/SAR Images

* Tracking optical and SAR images (dates) that work/don’t work
* Images from shared Google Drive (processed by OPERA team) and found on the Amazon S3 server

**List of images from HLS (B01):**

*\*TDT: Grays Harbor*

*\*TCT: WA coastline (not needed)*

*\*TDS: South Grays Harbor, Willapa Bay, Columbia River*

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| **DSWx-HLS Data** | | |
|  | Grays Harbor (TDT) - 23 | Willapa Bay (TDS) - 22 |
| Available dates | * 12/11/2021 * 12/14/2021 * 12/16/2021 * 12/19/2021 * 12/21/2021 * 12/23/2021 * 12/24/2021 * 12/26/2021 * 12/29/2021 * 12/31/2021 * 01/03/2022 * 01/07/2022 * 01/08/2022 * 01/10/2022 * 01/13/2022 * 01/15/2022 * 01/17/2022 * 01/20/2022 * 01/22/2022 * 01/23/2022 * 01/25/2022 * 01/27/2022 * 01/28/2022 | * 12/11/2021 * 12/16/2021 * 12/19/2021 * 12/21/2021 * 12/23/2021 * 12/26/2021 * 12/29/2021 * 12/31/2021 * 01/02/2022 * 01/03/2022 * 01/07/2022 * 01/08/2022 * 01/10/2022 * 01/13/2022 * 01/15/2022 * 01/17/2022 * 01/20/2022 * 01/22/2022 * 01/23/2022 * 01/25/2022 * 01/27/2022 * 01/28/2022 |

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| **DSWx-S1 Data** | | |
|  | Grays Harbor (TDT) - 6 | Willapa Bay (TDS) - 9 |
| Available dates | * 12/10/2021 * 12/12/2021 * 12/19/2021 * 12/22/2021 * 12/18/2023 | * 12/10/2021 * 12/12/2021 * ~~12/16/2021~~ * 12/19/2021 * 12/22/2021 * ~~12/28/2021~~ * ~~01/09/2022~~ * ~~01/21/2022~~ * 12/18/2023 |

**Data availability:**

***HLS***

***S1***

* T10UEV - Nov 14-17 2021: No S1 data
* T10TDS, T10TDT, T10TCT - December 10, 2021 - January 30, 2022: 2022\_share directory
* T10TDS, T10TDT, T10TCT -December 01 - 21, 2023 (DSWx-S1 only):  2023\_share directory
* TDT: Grays Harbor
* TCT: WA coastline (not needed)
* TDS: South Grays Harbor, Willapa Bay, Columbia River

**HLS/S1 File-Naming Convention**

**P**roject\_**L**evel\_**P**roduct**S**hort**N**ame-**S**ource\_**T**ile**ID**\_**D**ate**T**ime\_**P**roduct**G**eneration**D**ate**T**ime\_**Sat ellite**\_**P**ixel**S**pacing\_**P**roduct**V**ersion\_**L**ayer**N**umber\_**L**ayerName.**E**xt (*DSWx-HLS*)

**P**roject\_**L**evel\_**P**roduct**S**hort**N**ame-**S**ource\_**T**ile**ID**\_**D**ate**T**ime\_**P**roduct**G**eneration**D**ate**T**ime\_**Sat** ensor\_**P**ixel**S**pacing\_**P**roduct**V**ersion\_**L**ayer**N**umber\_**L**ayerName.**E**xt (*DSWx-S1*)

* **P**roject: “OPERA”
* **L**evel: “L3”
* **P**roduct**S**hort**N**ame: “DSWx”
* **S**ource: The input source of the product (“HLS” in this case)
* **T**ile**ID**: Specific tile ID of product (“TDS”, “TCT”, TDT”)
* **D**ateTime: GMT; format: YYYYMMDDTHHMMSSZ
* **P**roduct**G**eneration**D**ate**T**ime: GMT; format: YYYYMMDDTHHMMSSZ
* **Satellite** (HLS): The image input satellite “S2A” (Sentinel-2A), “S2B” (Sentinel-2B), or “L8” (Landsat 8)
* **S**ensor (S1): Image input sensor “S1A” (Sentinel-1A) or “S1B” (Sentinel-1B)
* **P**ixel**S**pacing: Pixel spacing in meters
* **P**roduct**V**ersion: OPERA DSWx-HLS/DSWx-S1 product version number with 4 characters, including the letter “v” and two digits indicating the major and minor versions
* **L**ayer**N**umber: Three characters corresponding to the letter “B”, followed by a 2-digit integer indicating the DSWx-HLS layer number, starting with 01 for the WTR layer
* **L**ayer**N**ame: Name of the DSWx-HLS/DSWx-S1 layer
* **E**xt: File extension (“tif” in this case)

Example:

OPERA\_L3\_DSWx-HLS\_T10TDT\_20220125T191649Z\_20241025T180018Z\_S2B\_30\_v1.0\_B01\_WTR.tif

* **P**roject: “OPERA”
* **L**evel: “L3”
* **P**roduct**S**hort**N**ame: “DSWx”
* **S**ource: “HLS”
* **T**ile**ID**: T10TDT (T10=tile ID)
  + <https://hls.gsfc.nasa.gov/products-description/tiling-system/>
* **D**ateTime: GMT; format: YYYYMMDDTHHMMSSZ
* **P**roduct**G**eneration**D**ate**T**ime: GMT; format: YYYYMMDDTHHMMSSZ
* **Satellite** (HLS): The image input satellite “S2A” (Sentinel-2A), “S2B” (Sentinel-2B), or “L8” (Landsat 8)
* **S**ensor (S1): Image input sensor “S1A” (Sentinel-1A) or “S1B” (Sentinel-1B)
* **P**ixel**S**pacing: Pixel spacing in meters
* **P**roduct**V**ersion: OPERA DSWx-HLS/DSWx-S1 product version number with 4 characters, including the letter “v” and two digits indicating the major and minor versions
* **L**ayer**N**umber: Three characters corresponding to the letter “B”, followed by a 2-digit integer indicating the DSWx-HLS layer number, starting with 01 for the WTR layer
* **L**ayer**N**ame: Name of the DSWx-HLS/DSWx-S1 layer
* **E**xt: File extension (“tif” in this case)

**Layers:**

* DSWx-HLS uses Layers 1-10
* DSWx-S1 uses Layers 1-4

*Layer 1*: Water classification (WTR)

*Layer 2*: Binary water (BWTR)

*Layer 3*: Confidence (CONF)

*Layer 4*: Diagnostic layer (DIAG)

*Layer 5*: Interpretation of diagnostic layer into water classes (WTR-1)

*Layer 6*: Interpreted layer refined using land cover and terrain shadow testing (WTR-2)

*Layer 7*: Land cover classification (LAND)

*Layer 8*: Terrain shadow layer (SHAD)

*Layer 9*: Input HLS Fmask cloud/cloud-shadow classification (CLOUD)

*Layer 10*: Digital elevation model (DEM)

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| --- | --- | --- | --- | --- |
| **Grays Harbor (DSWx-S1) - BWTR** | | | | |
| *Date* | *# of wet cells* | *Wetted surface area [m2]* | *Westport water level (NAVD88) [m]* | *Montesano water level (NAVD88) [m]* |
| 12-18-23T142153Z | 264,390 | 237,951,000 | 2.206 | 2.875 |
| 12-10-21T142145Z | 265,923 | 239,330,700 | 2.11 | 2.61 |
| 12-12-21T020933Z | 266,999 | 240,299,100 | 2.1665 | 2.825 |
| 12-19-21T020156Z | 249,905 | 224,914,500 | -0.195 | 2.057 |
| 12-22-21T142055Z | 264,621 | 238,158,900 | 1.4755 | 2.69 |

Created polygon shape file to isolate cells

~~Area between [46.8590, 47.0437], [-124.1720, -123.3796]~~

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Willapa Bay (DSWx-S1) - BWTR** | | | | |
| *Date* | *# of wet cells* | *Wetted surface area [m2]* | *Tokepoint water level (NAVD88) [m]* | *Willapa River water level (NAVD88) [m]* |
| 12-18-23T142153Z | 394,925 | 355,432,500 | 2.3115 | 1.597 |
| 12-10-21T142145Z | 391,093 | 351,983,700 | 2.1835 | 1.865 |
| 12-12-21T020933Z | 387,087 | 348,378,300 | 2.265 | 4.748 |
| 12-19-21T020156Z | 346,045 | 311,440,500 | -0.018 | 2.83 |
| 12-22-21T142055Z | 385,069 | 346,562,100 | 1.701 | 2.45 |

Created polygon shape file to isolate cells

~~Area between [46.3405, 46.7522], [-124.0625, -123.6518]~~