***Preprocessing in SeaDAS l2gen Command Line***

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**Purpose**: Unzip and apply atmospheric corrections to Landsat 8 and Sentinel 2A & 2B Level 1 images in the SeaDAS command line with l2gen. Also applies vicarious calibration to Sentinel 2 imagery.

**Inputs:** Landsat 8 and Sentinel 2A & 2B Level 1 images downloaded from USGS Earth Explorer.

*Batch Unzip Files in macOS*

**L8**

Navigate to folder with images

bash

for f in \*.tar.gz; do tar xf “$f” -C /path/to/output\_directory/ ; done

**S2**

Navigate to folder with images

unzip \\*.zip -d /path/to/output\_directory/

*Batch Execute l2gen*

Highlighted year is target year and can be modified to point to the appropriate folder. Filepath should also be modified to reflect user’s file structure setup.

**L8**

bash

cd /Users/emb8xg/Documents/Seadas\_8.2/ocssw/

/Applications/Seadas\_8.2/bin/gpt; export OCSSWROOT=/Users/emb8xg/Documents/Seadas\_8.2/ocssw/; source OCSSW\_bash.env; ./bin/install\_ocssw -t V2022.0 --msis2a --msis2b --src --oli

cd /Users/emb8xg/Documents/Seadas\_8.2/ocssw/images/L8\_unzipped/2021/

for f in \*\_MTL.txt; do f2=${f%.\*}.L2\_LAC\_OC; l2gen ifile=$f ofile=/Users/emb8xg/Documents/Seadas\_8.2/ocssw/images/L8\_l2gen/Not\_run/$f2 north=37.729198 south=37.084875 east=-75.595402 west=-76.045972 land=/Users/emb8xg/Documents/Seadas\_8.2/ocssw/share/common/landmask\_null.dat maskland=0; done

**S2**

bash

cd /Users/emb8xg/Documents/Seadas\_8.2/ocssw/

/Applications/Seadas\_8.2/bin/gpt; export OCSSWROOT=/Users/emb8xg/Documents/Seadas\_8.2/ocssw/; source OCSSW\_bash.env; ./bin/install\_ocssw -t V2022.0 --msis2a --msis2b --src --oli

**S2A**

cd /Users/emb8xg/Documents/Seadas\_8.2/ocssw/images/S2A\_unzipped/2021/

for f in \*.SAFE; do f2=${f%.\*}.manifest.safe.L2; l2gen ifile=$f/manifest.safe ofile=/Users/emb8xg/Documents/Seadas\_8.2/ocssw/images/S2A\_l2gen/2016/$f2 north=37.729198 south=37.084875 east=-75.595402 west=-76.045972 maskland=0 land=/Users/emb8xg/Documents/Seadas\_8.2/ocssw/share/common/landmask\_null.dat vcal\_opt=1 gain=[0.9841,0.988,1.0079,1.00841,1.0091,1.0201,0.9801,1.0,1.0,1.0,1.0,1.0] ; done

**S2B**

cd /Users/emb8xg/Documents/Seadas\_8.2/ocssw/images/S2B\_unzipped/2021/

for f in \*.SAFE; do f2=${f%.\*}.manifest.safe.L2; l2gen ifile=$f/manifest.safe ofile=/Users/emb8xg/Documents/Seadas\_8.2/ocssw/images/S2B\_l2gen/2021/$f2 north=37.729198 south=37.084875 east=-75.595402 west=-76.045972 maskland=0 land=/Users/emb8xg/Documents/Seadas\_8.2/ocssw/share/common/landmask\_null.dat vcal\_opt=1 gain=[1.0027,0.9996,1.0143,1.0054,1.0334,1.0406,0.9808,1.0,1.0,1.0,1.0,1.0] ; done

**Sentinel 2 Gains**

**S2A**

Lambda(1) = 443

Lambda(2) = 492

Lambda(3) = 560

Lambda(4) = 665

Lambda(5) = 704

Lambda(6) = 740

Lambda(7) = 783

Lambda(8) = 835

Lambda(9) = 865

Lambda(10) = 945

Lambda(11) = 1613

Lambda(12) = 2200

S2A: Default: gain=[0.9894,0.9878,1.0213,1.0060,1.0266,1.0048,0.9770,1.0,1.0,1.0,1.0,1.0]

New: gain=[0.9841,0.988,1.0079,1.00841,1.0091,1.0201,0.9801, 1.0,1.0,1.0,1.0,1.0]

**S2B**

Lambda(1) = 442

Lambda(2) = 492

Lambda(3) = 559

Lambda(4) = 665

Lambda(5) = 704

Lambda(6) = 739

Lambda(7) = 780

Lambda(8) = 835

Lambda(9) = 864

Lambda(10) = 943

Lambda(11) = 1611

Lambda(12) = 2184

S2B: Default: gain=[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0]

New: gain=[1.0027,0.9996,1.0143,1.0054,1.0334,1.0406,0.9808,1.0,1.0,1.0,1.0,1.0]

*Gains obtained from* (Pahlevan et al., 2019)

Pahlevan, N., Chittimalli, S. K., Balasubramanian, S. v., & Vellucci, V. (2019). Sentinel-2/Landsat-8 product consistency and implications for monitoring aquatic systems. *Remote Sensing of Environment*, *220*, 19–29. https://doi.org/10.1016/J.RSE.2018.10.027

