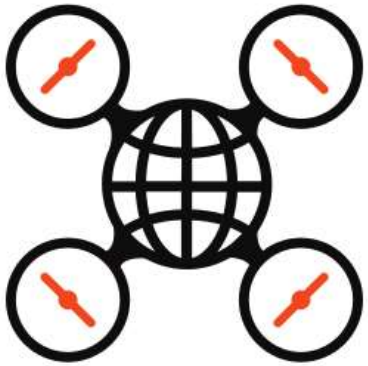

Open Source Data Processing With

OpenDroneMap

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Twomile Heavy Industries, Inc.
corey@twomile.com

UCANR DroneCamp - June 24, 2020

Hands-On Exercises

These slides are a companion to the “Open Source Data Processing With ODM” session at DroneCamp 2020. They walk through the hands-on exercises. If you would like a paper copy of the exercises to use as we go, print these and have them on hand for the session.

- Part A – Processing
- Part B – Working With Outputs

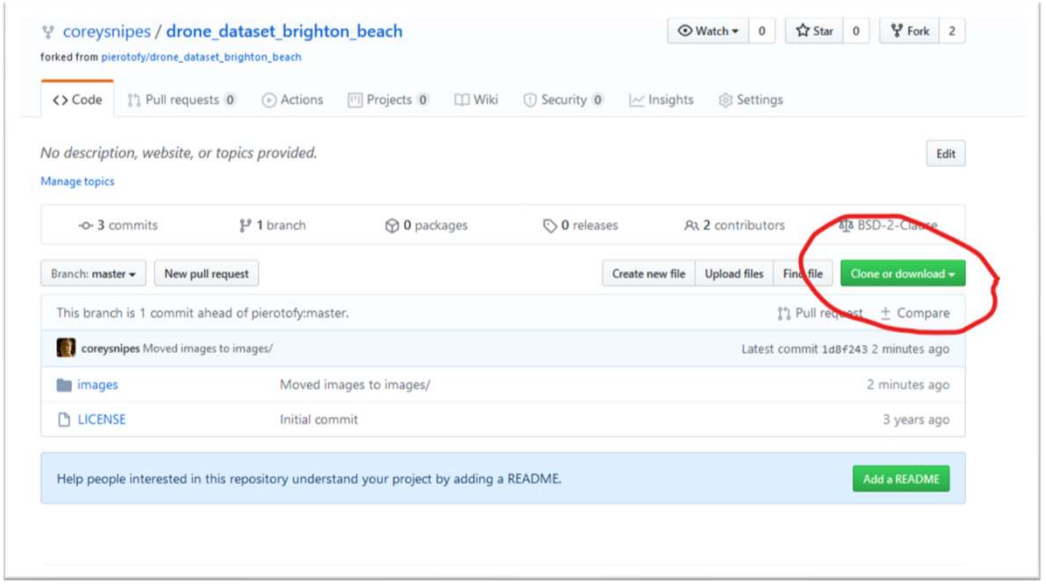
OpenDroneMap

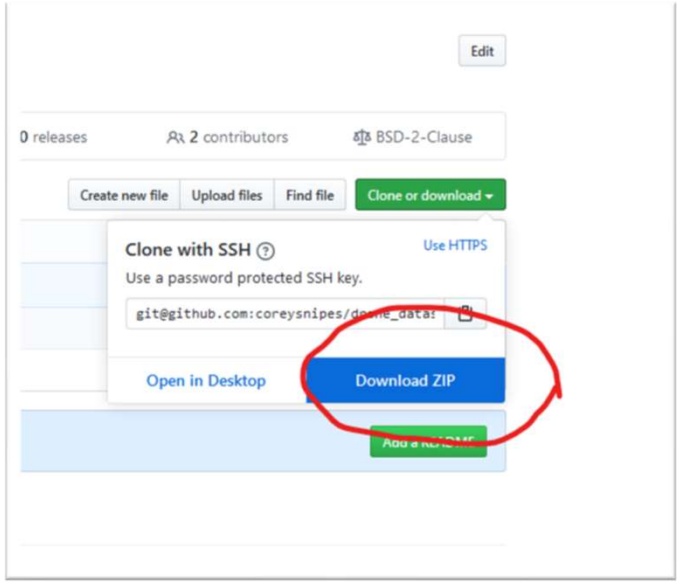
HANDS-ON WITH ODM

Part A - Start Processing

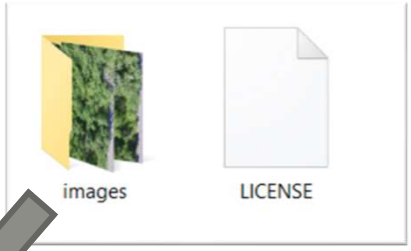
Download Sample Data

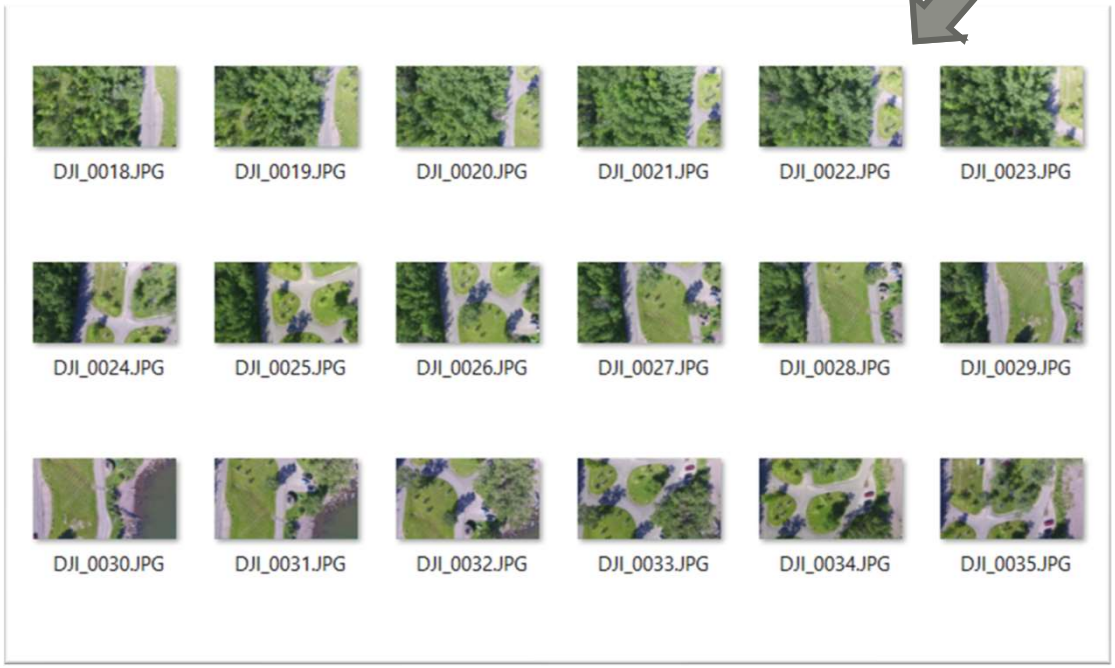
- https://github.com/coreysnipes/drone_dataset_brighton_beach





Unzip Files


images
LICENSE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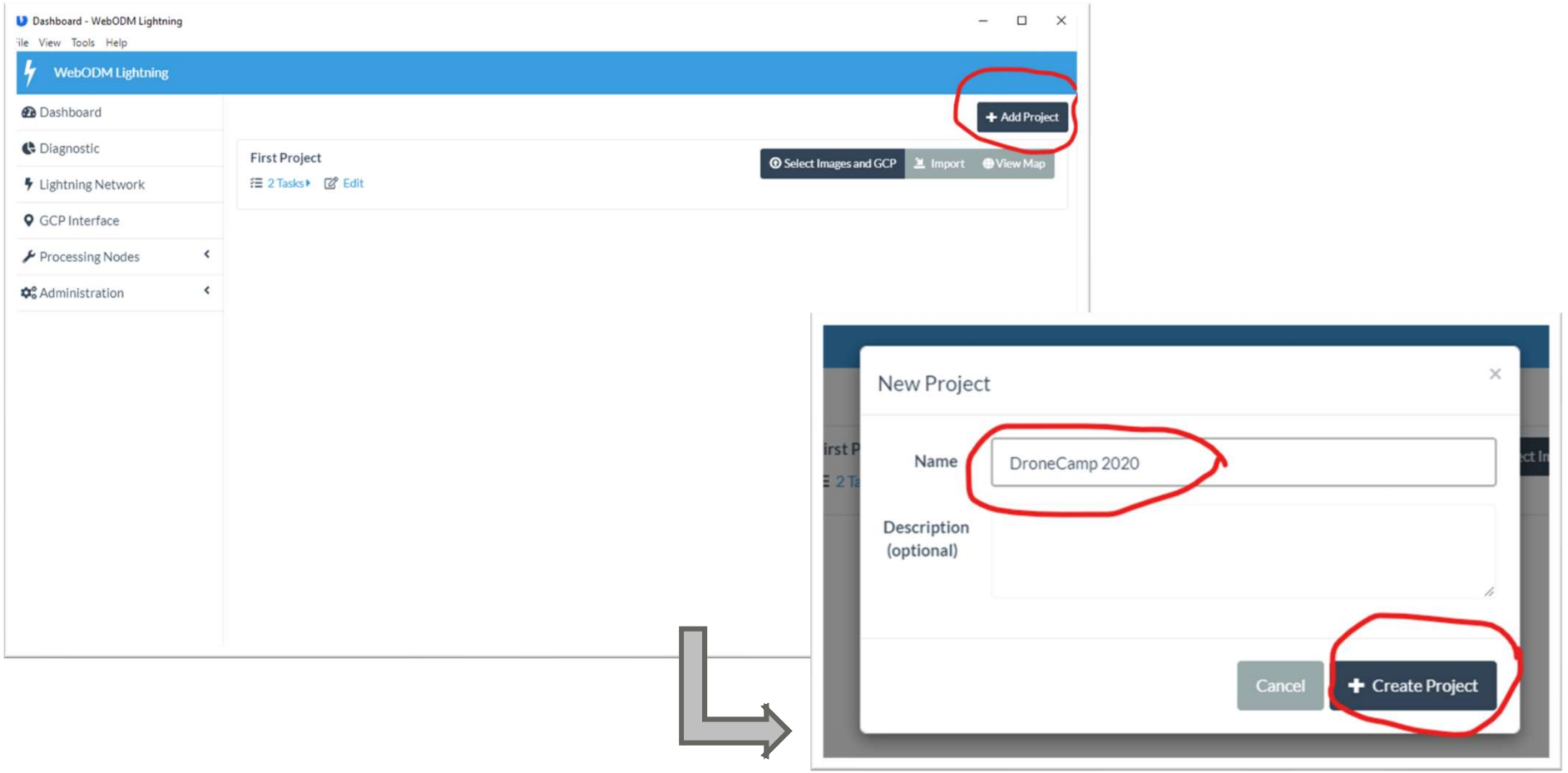
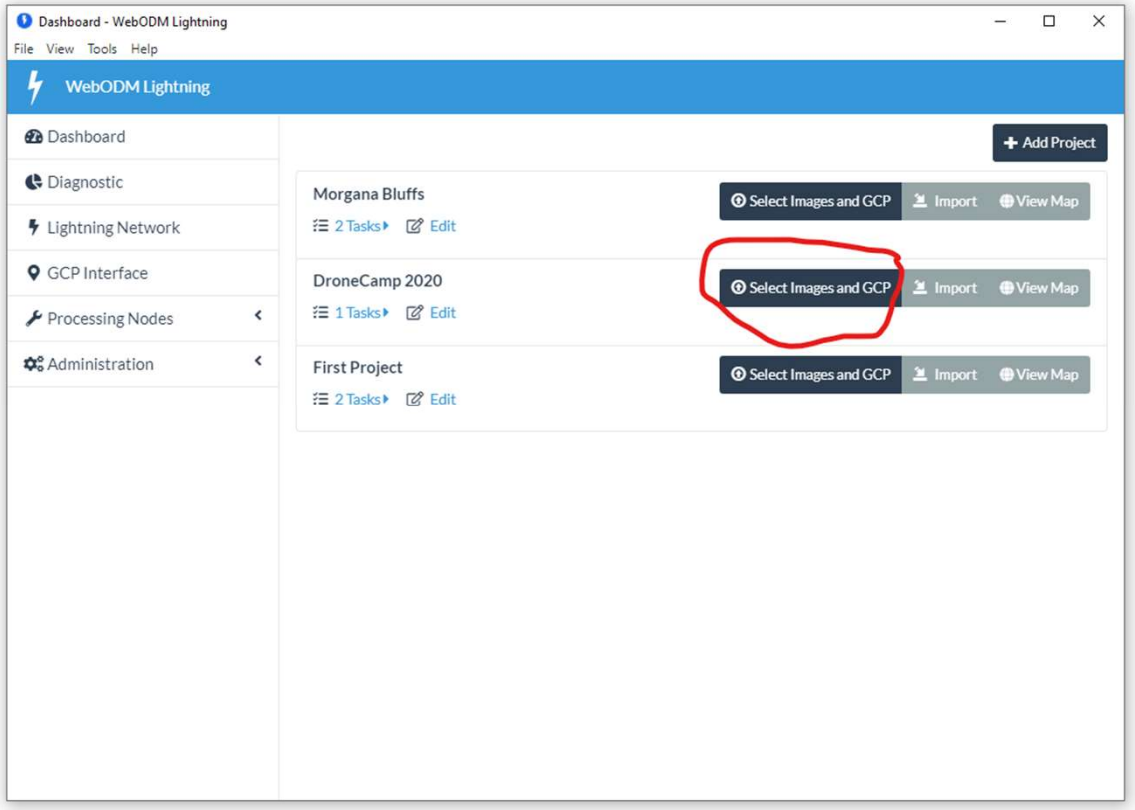
DJI_0034.JPG
DJI_0035.JPG

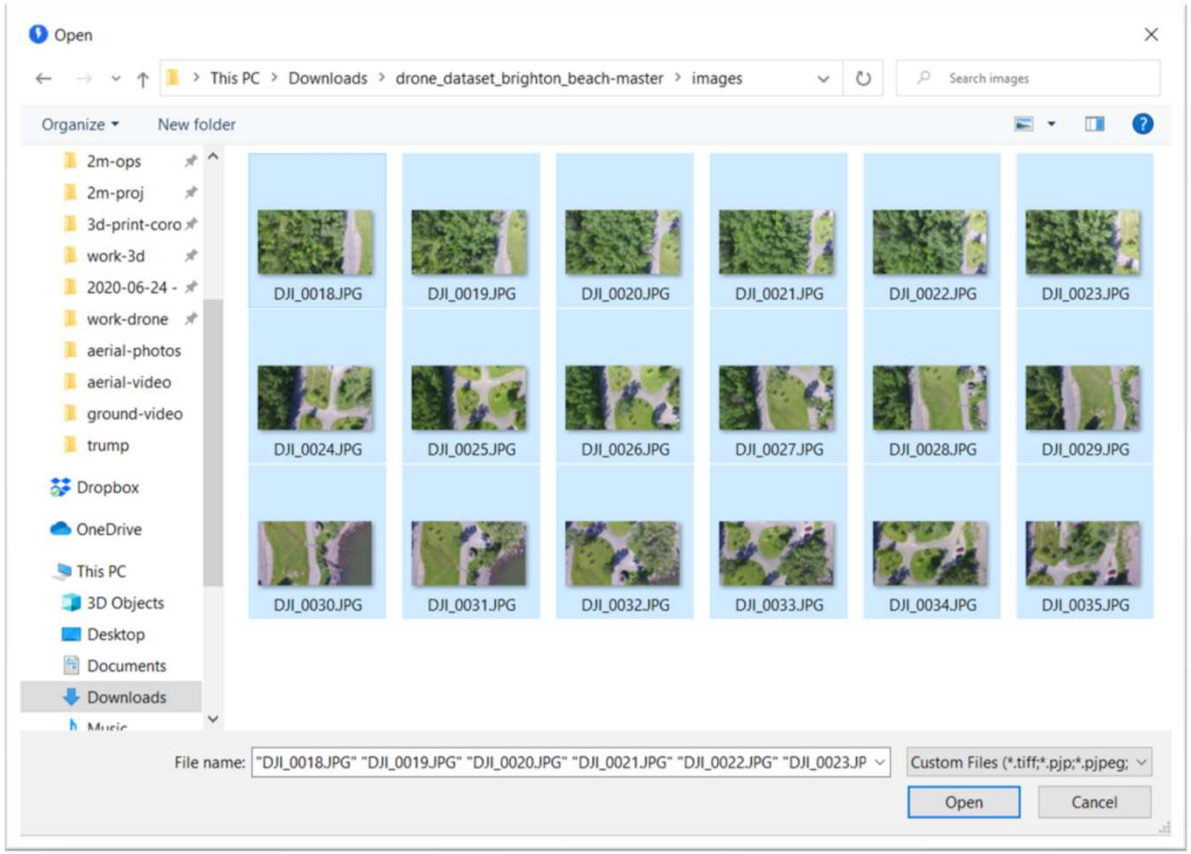
Open WebODM Lightning



Add Images


Dashboard - WebODM Lightning
File View Tools Help
WebODM Lightning
Dashboard
Diagnostic
Lightning Network
GCP Interface
Processing Nodes
Administration
+ Add Project
Morgana Bluffs
2 Tasks
Edit
Select Images and GCP
Import
View Map
DroneCamp 2020
1 Tasks
Edit
Select Images and GCP
Import
View Map
First Project
2 Tasks
Edit
Select Images and GCP
Import
View Map

Add Images


Open
This PC
Downloads
drone_dataset_brighton_beach-master
images
Search images
Organize
New folder
2m-ops
2m-proj
3d-print-coro
work-3d
2020-06-24 -
work-drone
aerial-photos
aerial-video
ground-video
trump
Dropbox
OneDrive
This PC
3D Objects
Desktop
Documents
Downloads
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DJI_0034.JPG
DJI_0035.JPG
File name:
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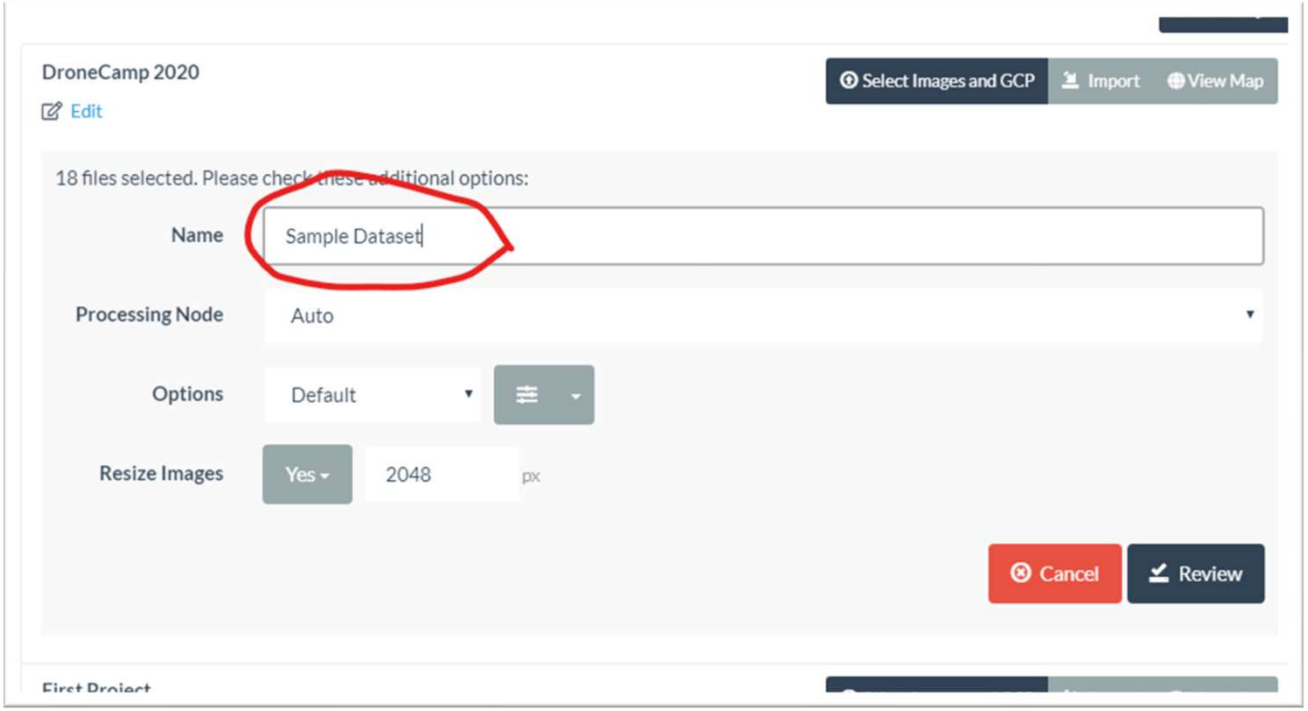
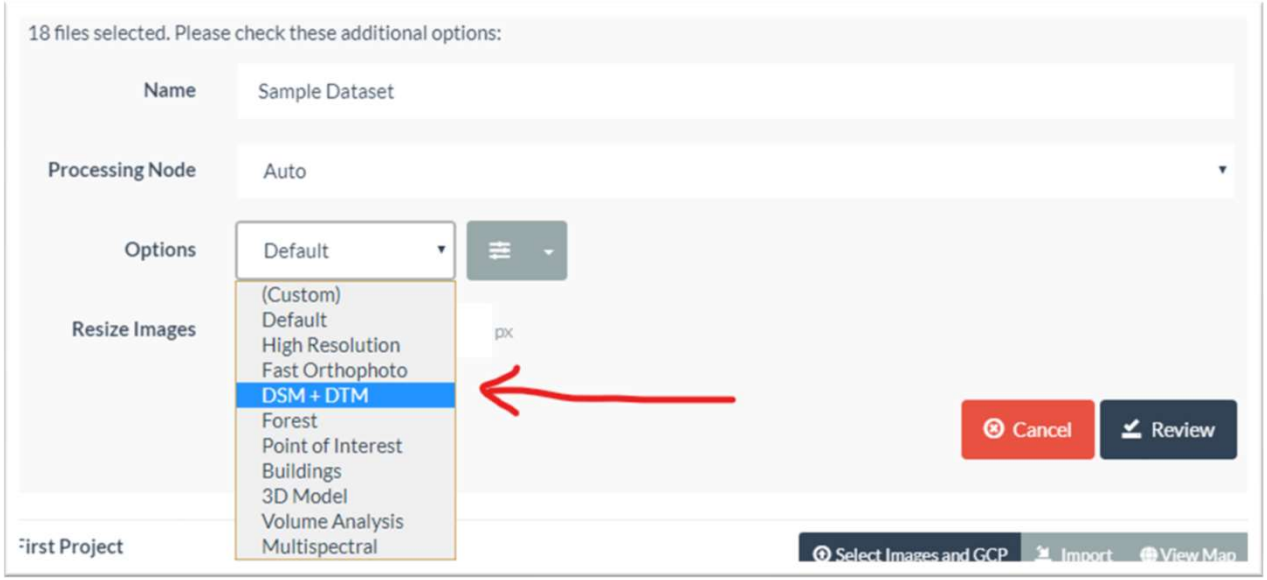
Custom Files (*.tiff;*.pjp;*.pjpeg;
Open
Cancel

Set Configuration



Set Configuration



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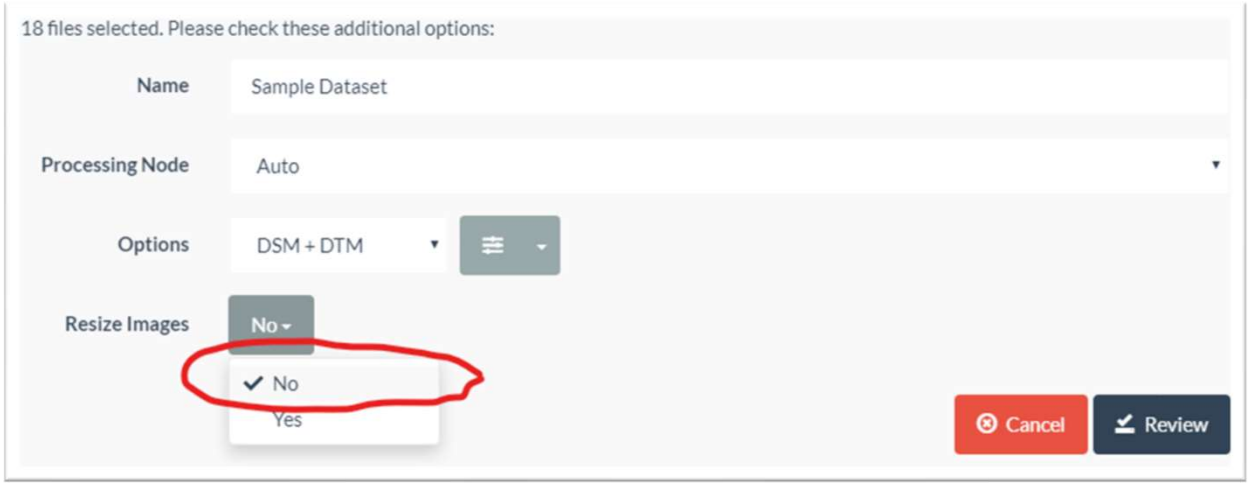
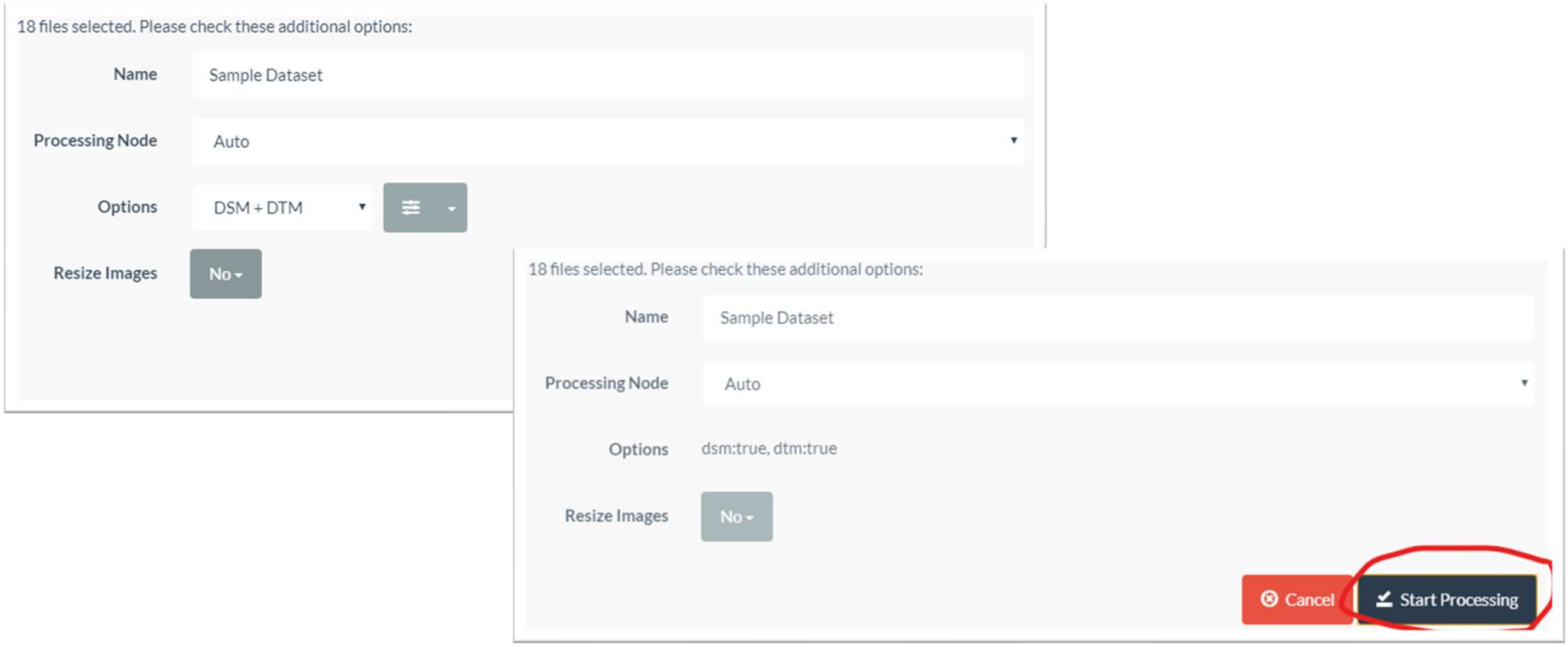
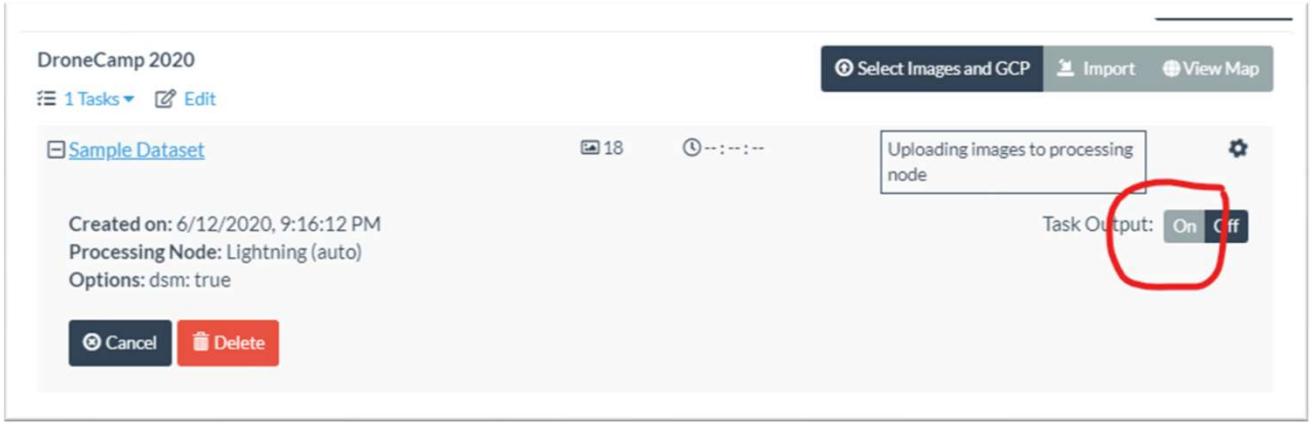


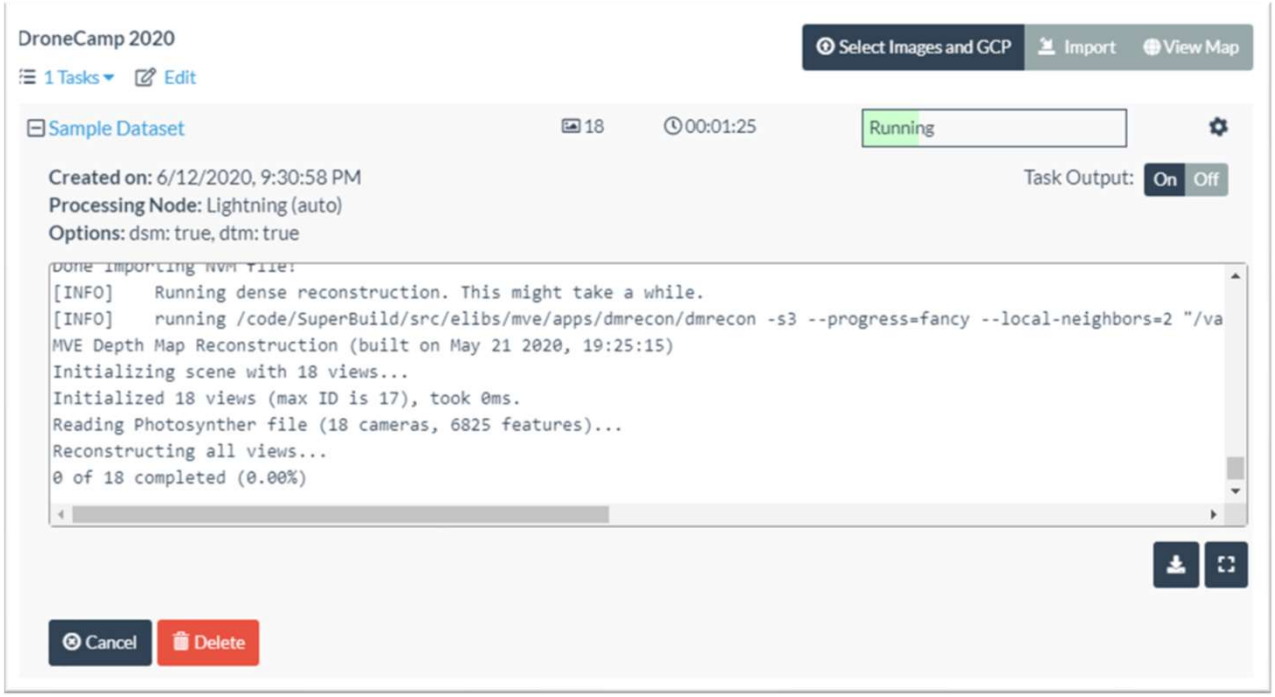
Start Processing



Processing Status



Running


DroneCamp 2020
Select Images and GCP
Import
View Map
1 Tasks
Edit
Sample Dataset
18
00:01:25
Running
Created on: 6/12/2020, 9:30:58 PM
Processing Node: Lightning (auto)
Options: dsm: true, dtm: true
Task Output:
On
Off
Done importing NVM file!
[INFO] Running dense reconstruction. This might take a while.
[INFO] running /code/SuperBuild/src/elibs/mve/apps/dmrecon/dmrecon -s3 --progress=fancy --local-neighbors=2 "/va
MVE Depth Map Reconstruction (built on May 21 2020, 19:25:15)
Initializing scene with 18 views...
Initialized 18 views (max ID is 17), took 0ms.
Reading Photosynther file (18 cameras, 6825 features)...
Reconstructing all views...
0 of 18 completed (0.00%)
Cancel
Delete

OpenDroneMap

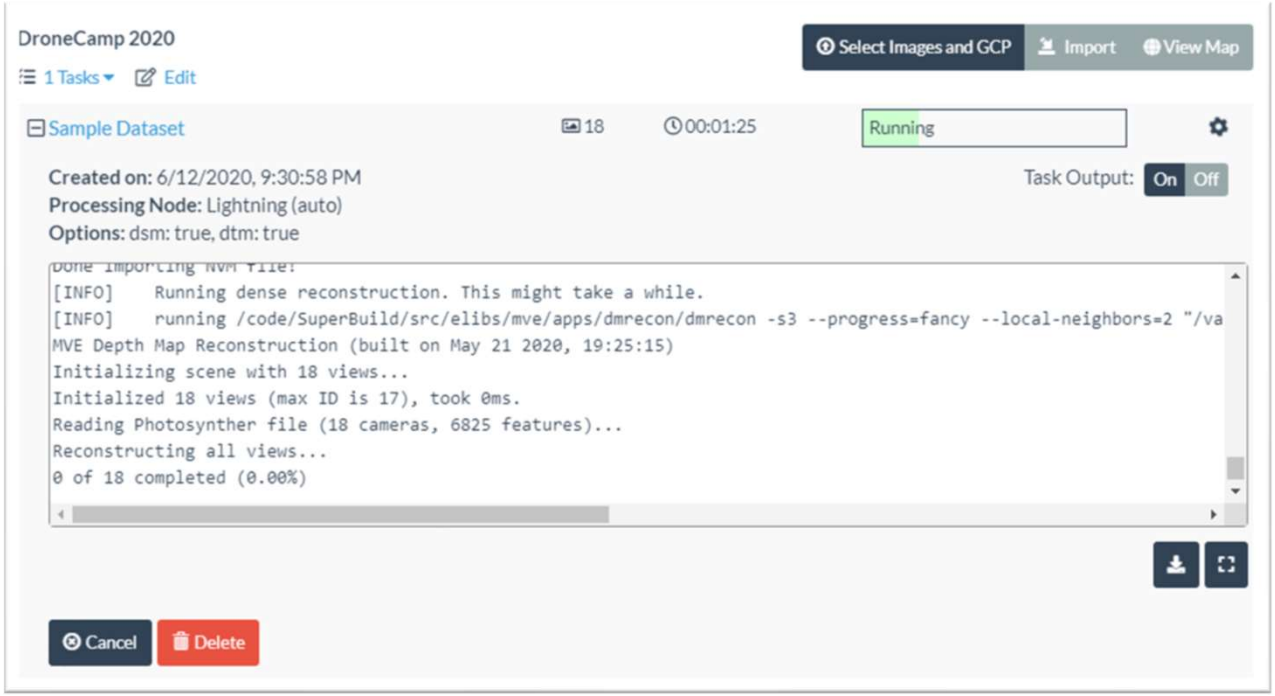
HANDS-ON WITH ODM

Part B – Working with ODM Outputs

WebODM vs. WebODM Lightning

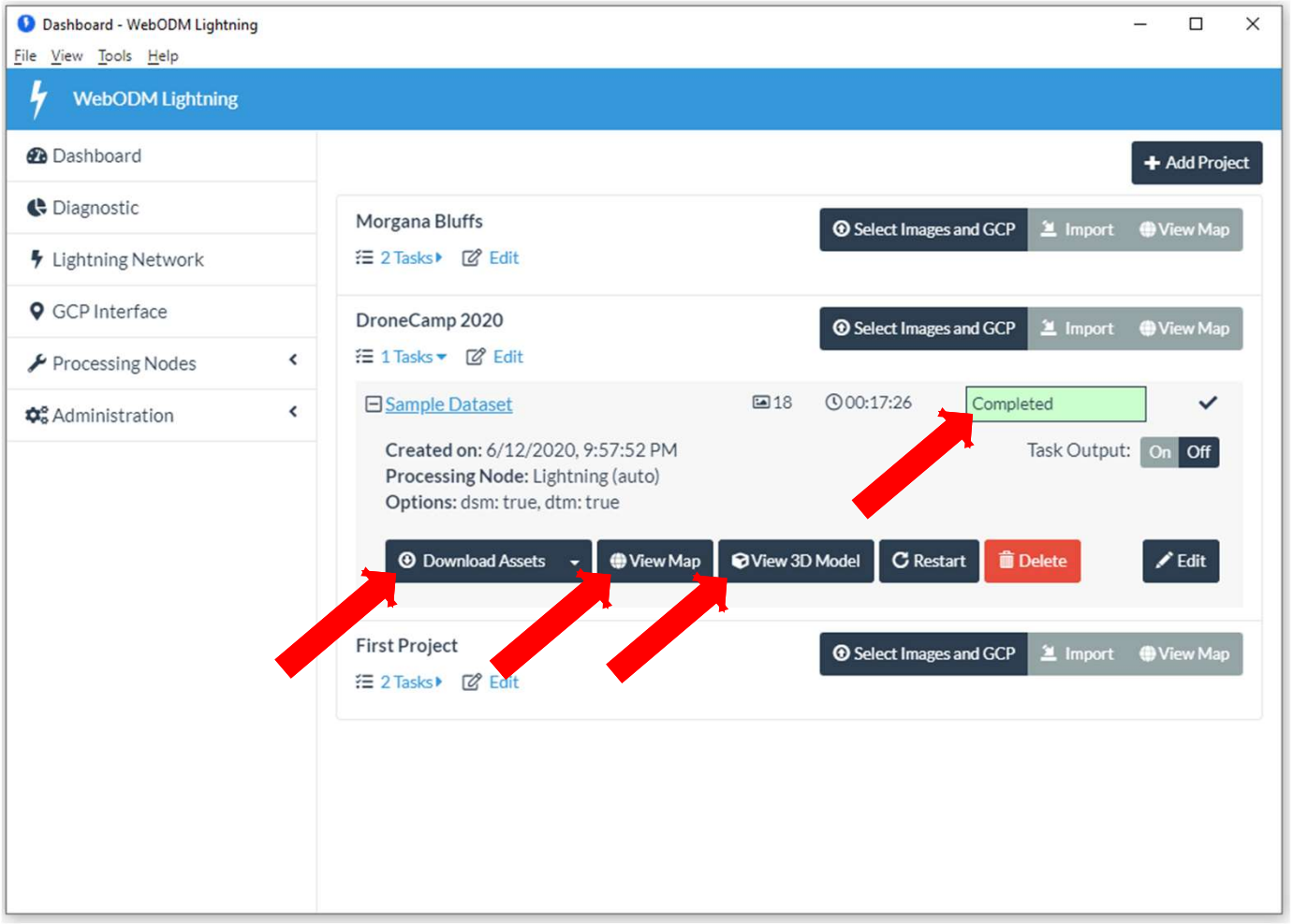
- WebODM
  - *Install for free*
  - *Process locally for free*
- WebODM Lightning 
  - *Commercial service*
  - *Install for free*
  - *Process in the cloud ($)*

Still Running?

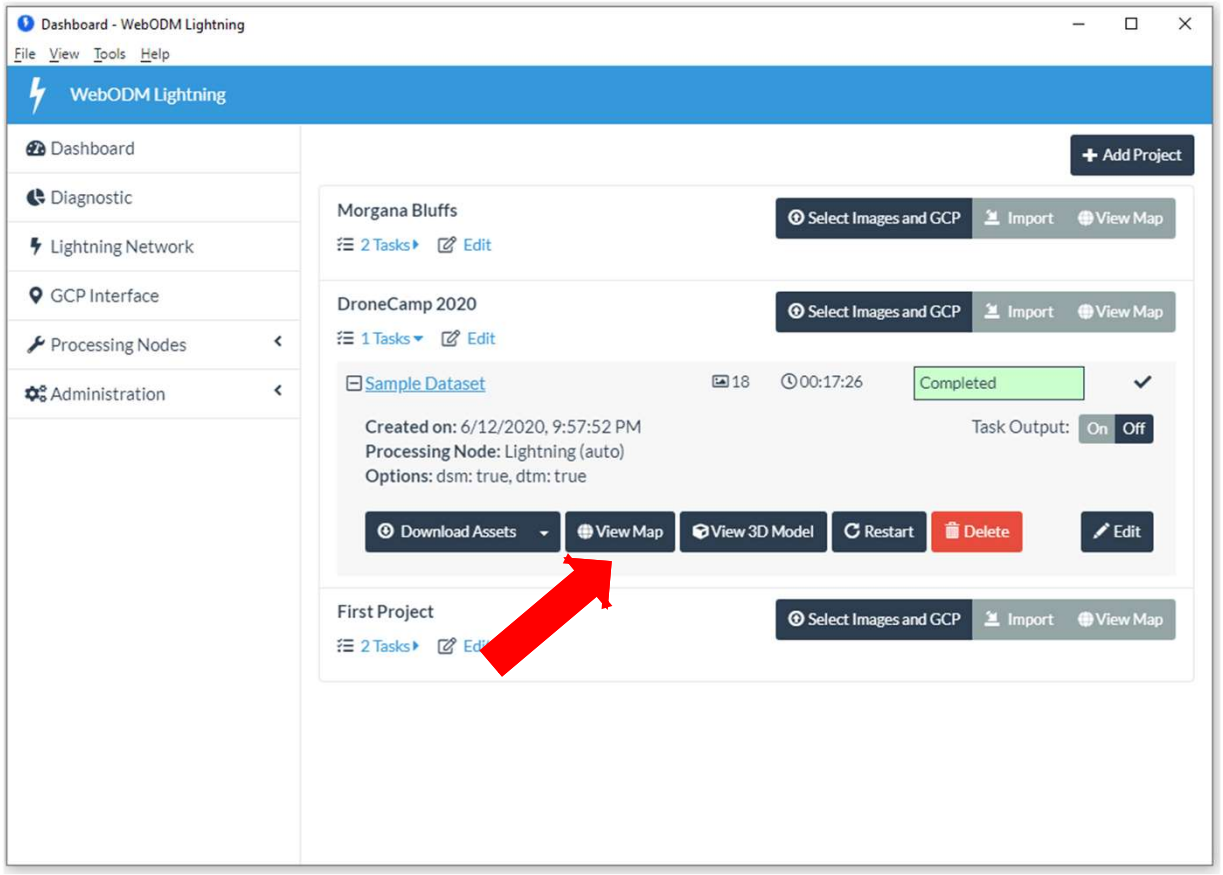


Finished

- Today,
  Speed > Quality

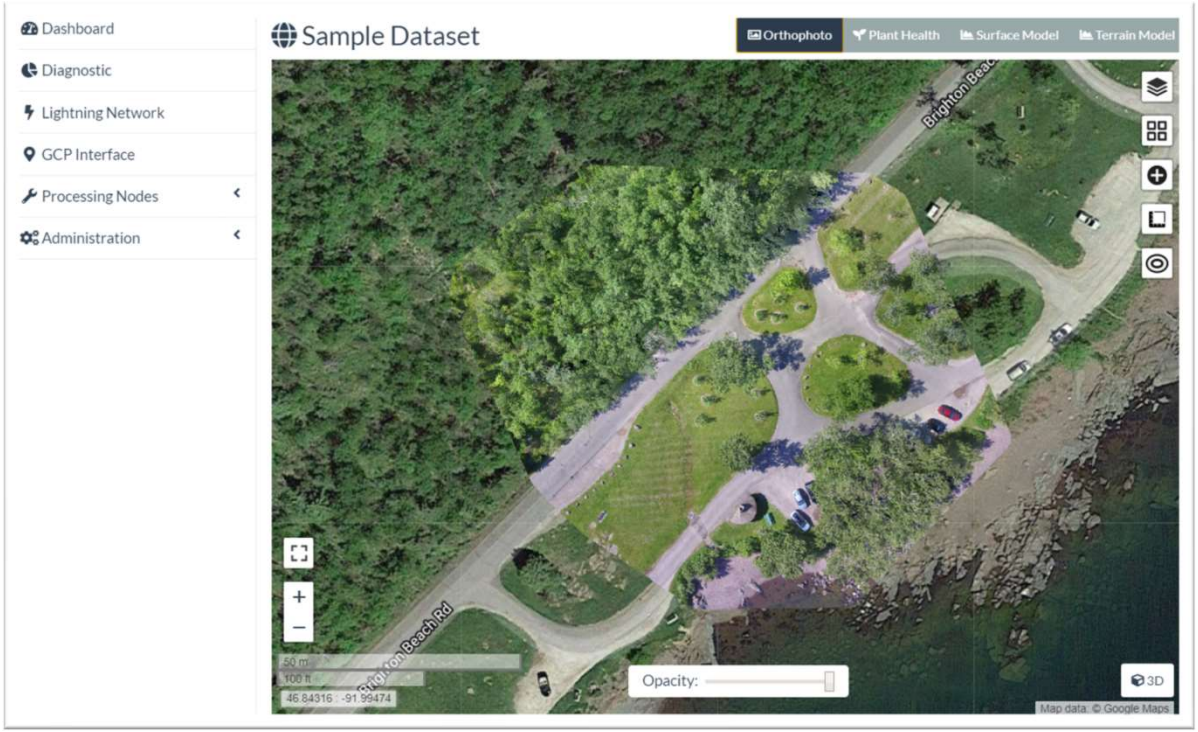


Exercises – 2D Orthophoto



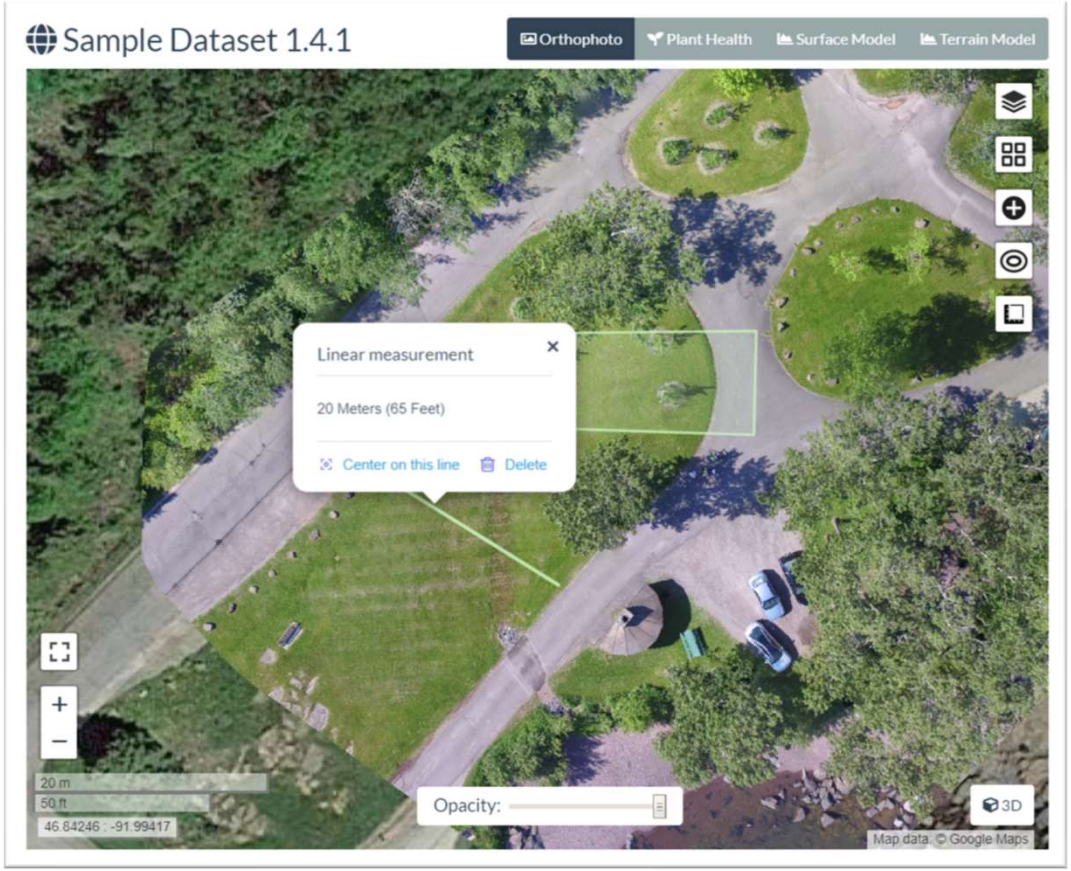
#1 – Orthophoto - Navigate

A. Click+hold = move map
B. Scroll wheel = zoom in/out
C. Map controls +/- = zoom
D. Map control square = full screen
E. Top buttons:
    A. *Ortho*
    B. *Plant Health*
    C. *Surface Model*
    D. *Terrain Model*



#2 – Orthophoto - Measure

A. Click ruler (4th on right)
B. Create new measurement
C. Click 2 points on map
D. Click “Finish measurement”
E. View calculations in white balloon
F. Close balloon with “x”
G. Click ruler again, new measurement
H. Click 4 points on map to make a box, click “Finish”
I. View calculations
J. Click “Delete” to remove it

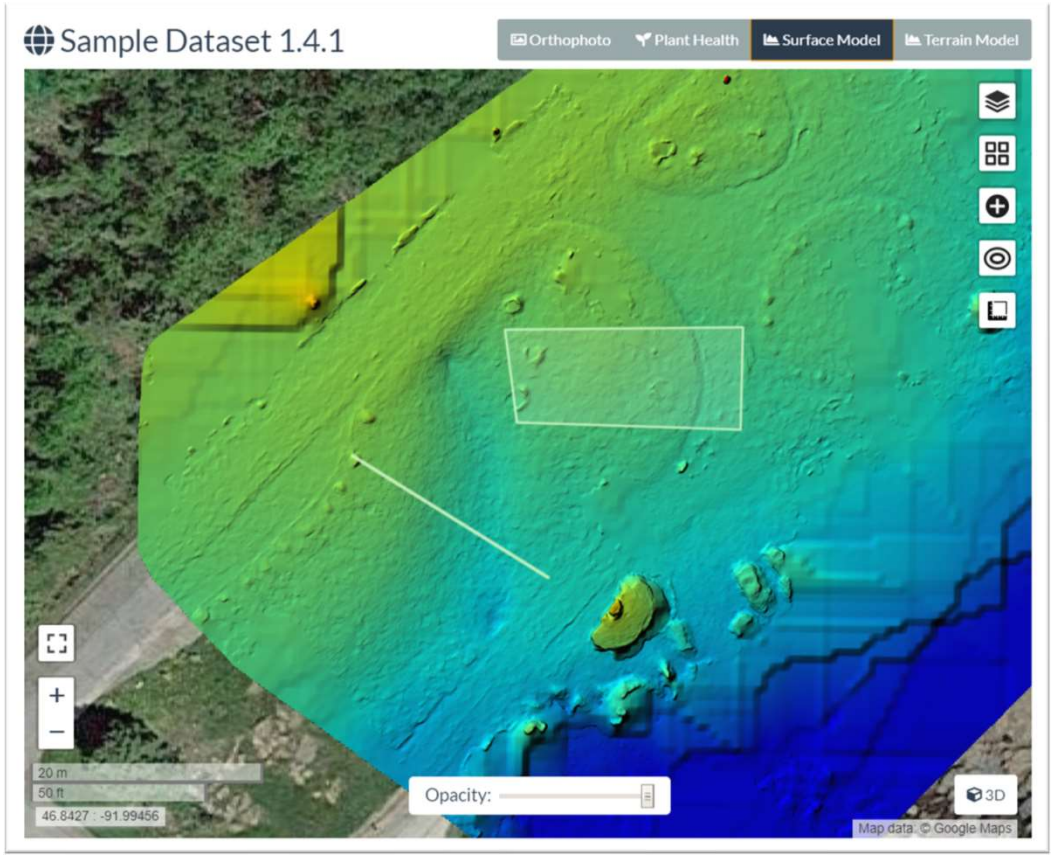


#3 – Plant Health

A. 2nd Top Button: Plant Health
B. Note color differences in different grassy areas
C. Click top right “layers” icon
D. View “Algorithm” options
E. View “Color” options
F. Drag min/max bars
G. Export GeoTIFF

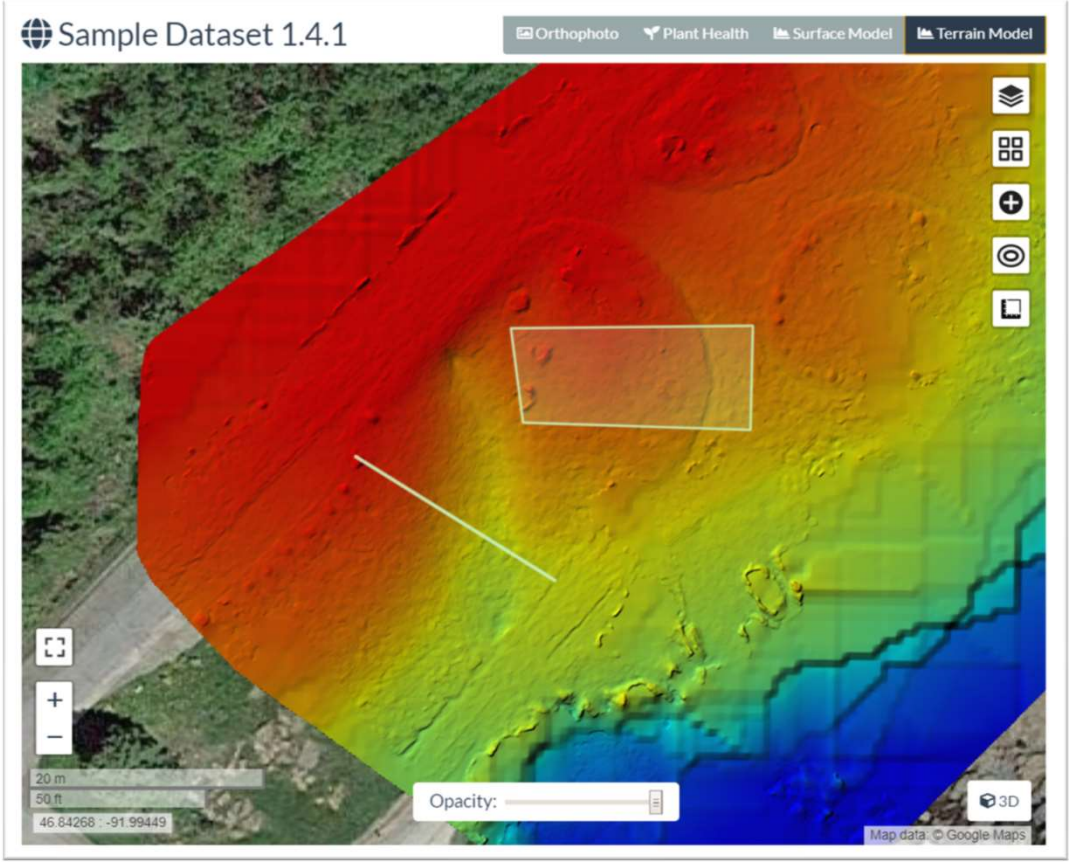
#4 – Surface Model (DSM)

A. 3rd Top Button: Surface Model
B. Wait for calc/load
C. Note color varies by altitude
D. Click top right “layers” icon
E. View “Color” options
F. Drag min/max bars
G. Wait for refresh
H. Export GeoTIFF

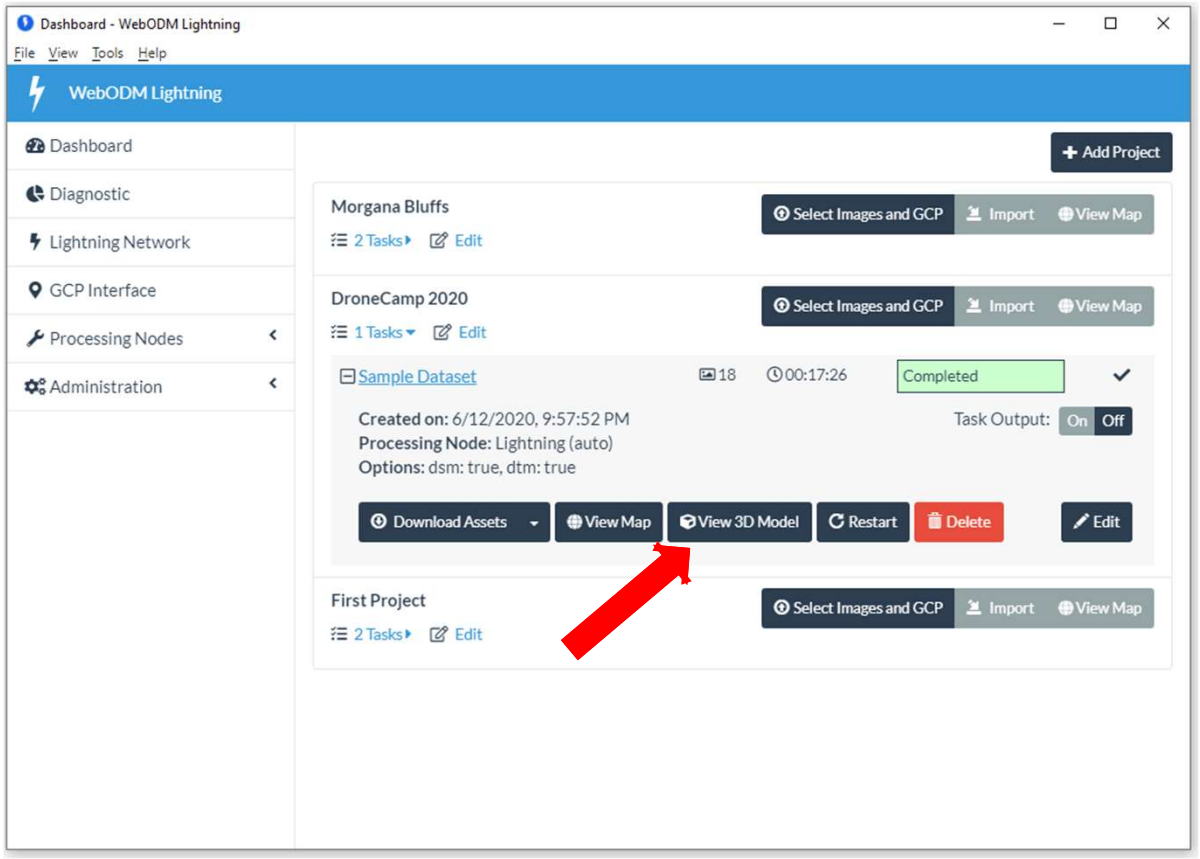


#5 – Terrain Model (DTM)

A. 4th Top Button: Terrain Model
B. Wait for calc/load
C. Note color varies by altitude
D. Click top right “layers” icon
E. View “Color” options
F. Drag min/max bars
G. Wait for refresh
H. Export GeoTIFF

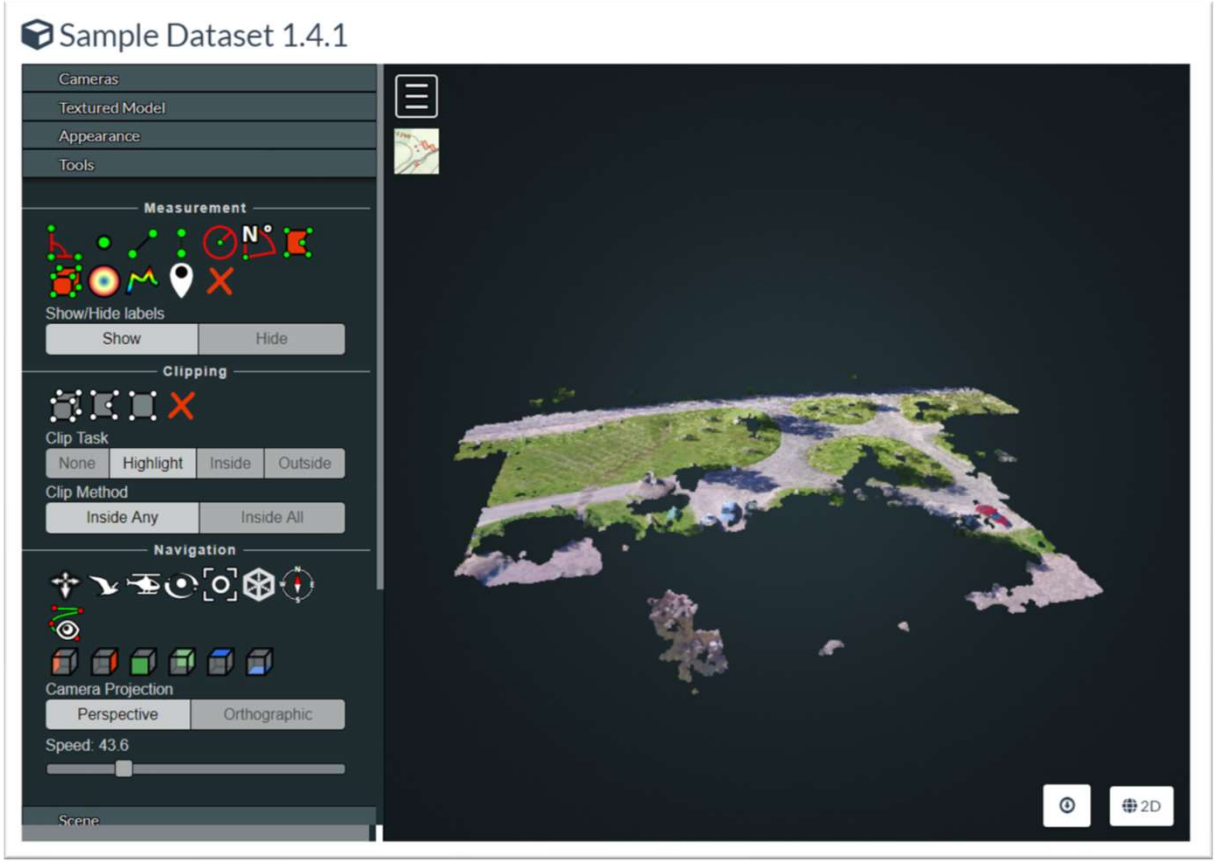


Exercises – 3D Model



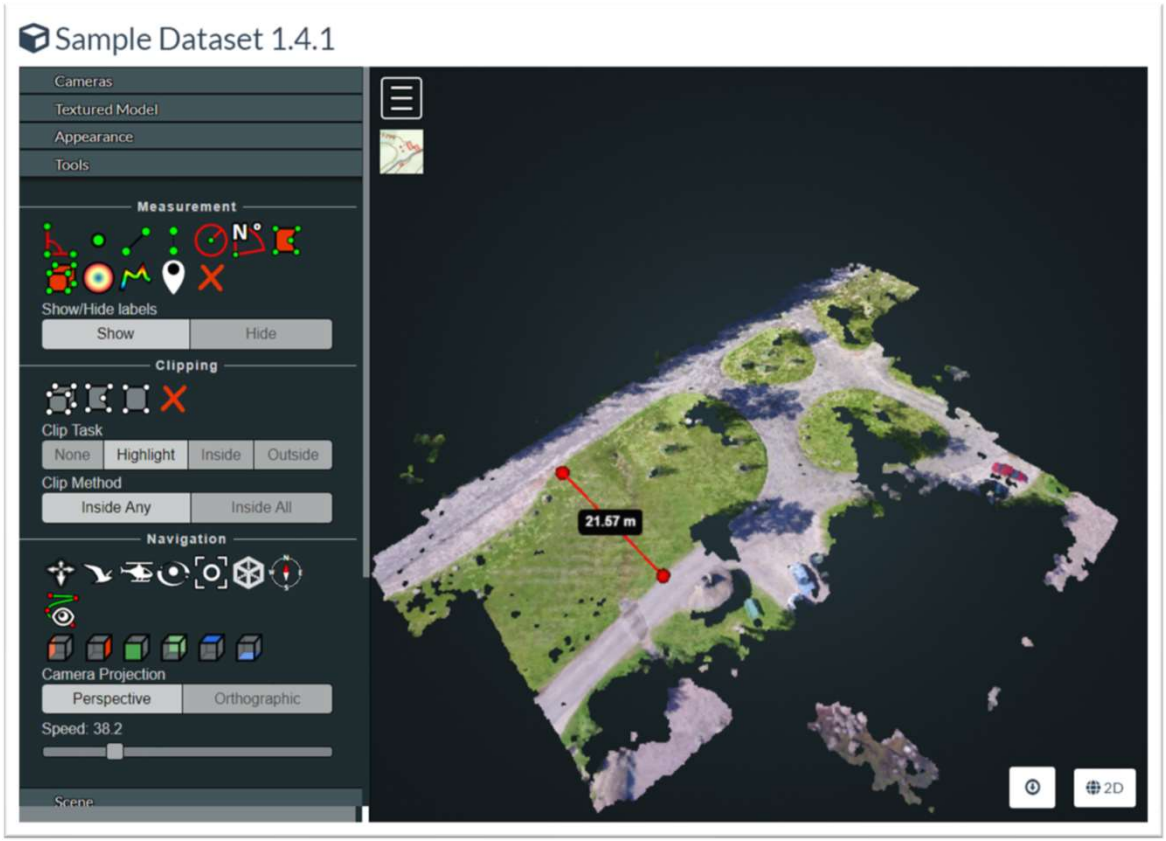
#6 – 3D Model - Navigate

A. Left click+drag = rotate model
B. Right click+drag = move model
C. Scroll wheel = zoom in/out
D. Top left (3 bars) button = collapse tools
E. Top left (map) button = show model location
F. Tools
   A. *Measure*
   B. *Navigation*
G. Appearance
H. Scene



#7 – 3D Model – Measure (Linear)

A. Adjust the model so you can see
B. Click 3rd Measurement tool (angled line)
C. LEFT click 2 points in a grassy area on the map
D. Now RIGHT click the last point to finish
E. View measured distance (m)
F. Click red “X” in measurement tools, to delete



#8 – 3D Model – Measure (Area)

A. Adjust the model so you can see
B. Click top right Measurement tool (red box)
C. LEFT click 4 points in a grassy area on the map
D. Now RIGHT click the last point to finish
E. View measured distances (white)
F. View measured area (green)

#9 – View Textured Model

A. Find “Textured Model” near the top of the tool menu

B. Click to expand, then click “Show Model”

C. Wait a few seconds

D. View how the scene becomes more detailed, holes are filled

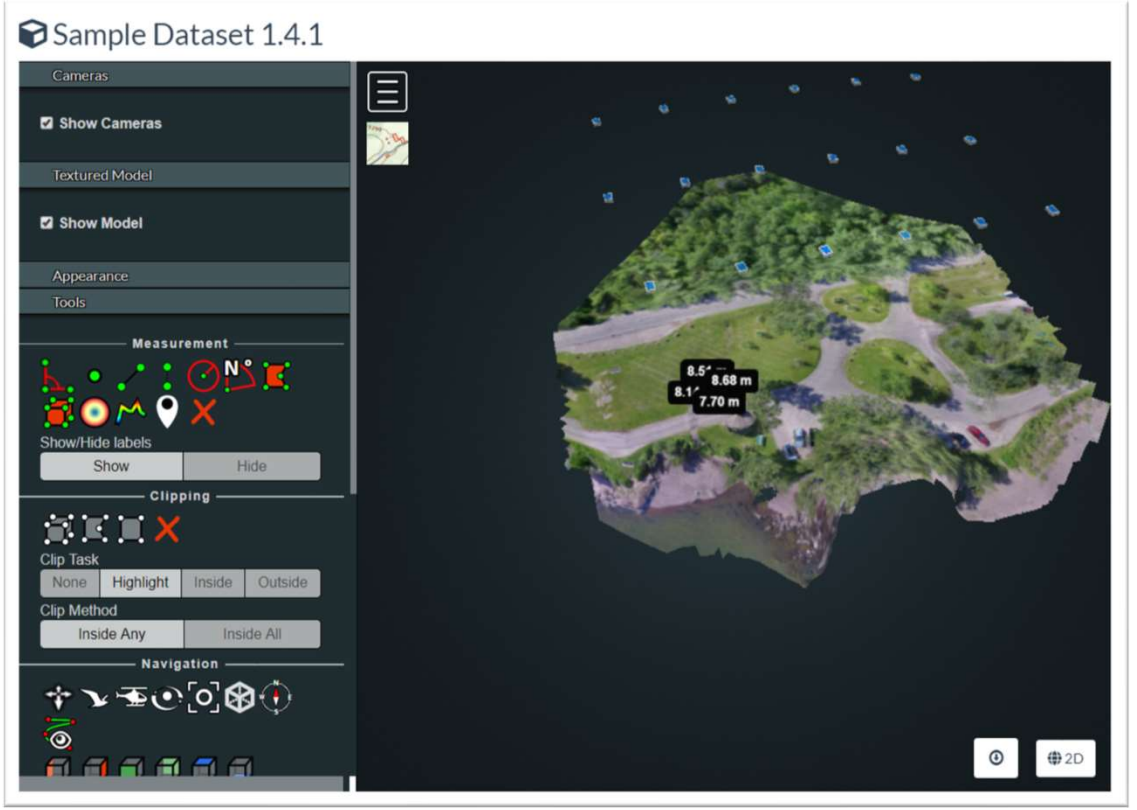
E. Uncheck and check the box to turn off, and on

F. Move the model around to view other parts

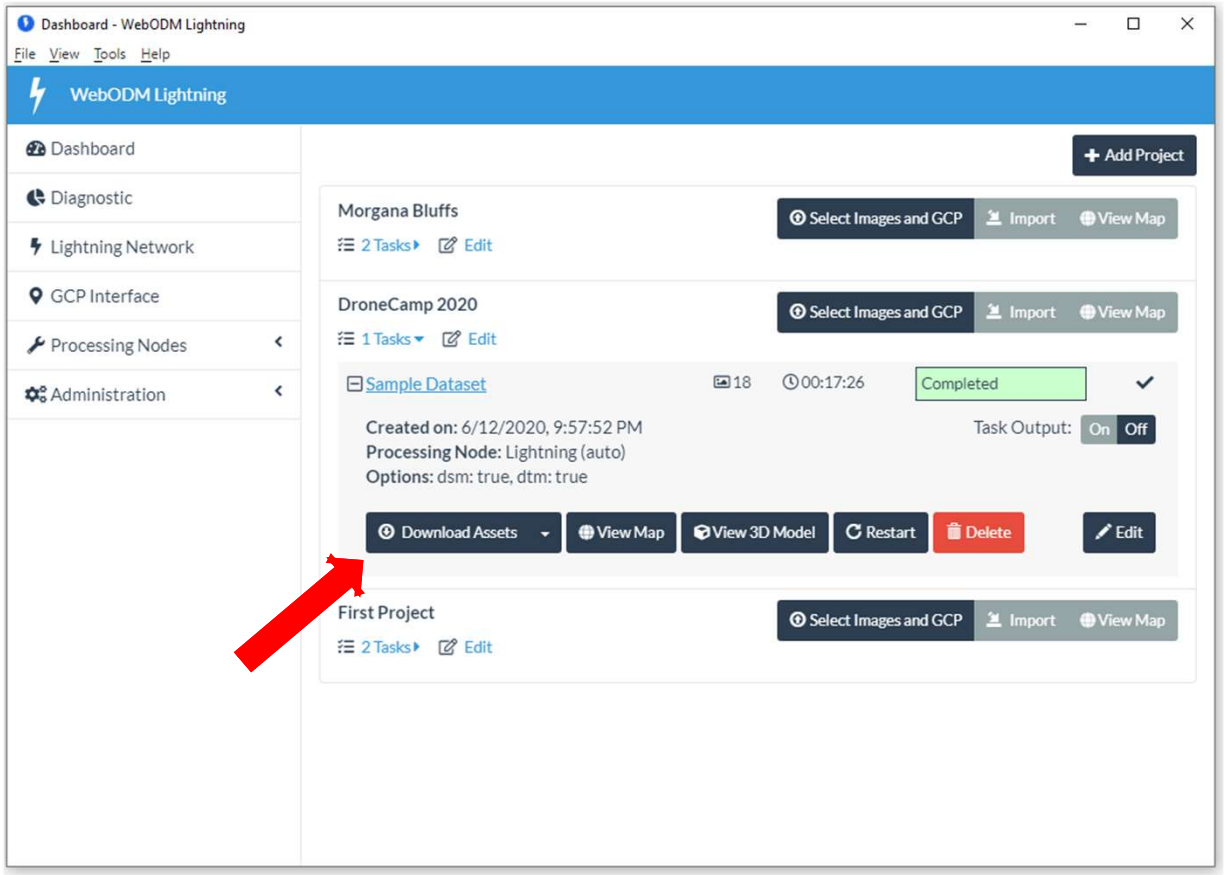
G. Edges of model = lots of error
Interior of model = better precision

#10 – View Cameras

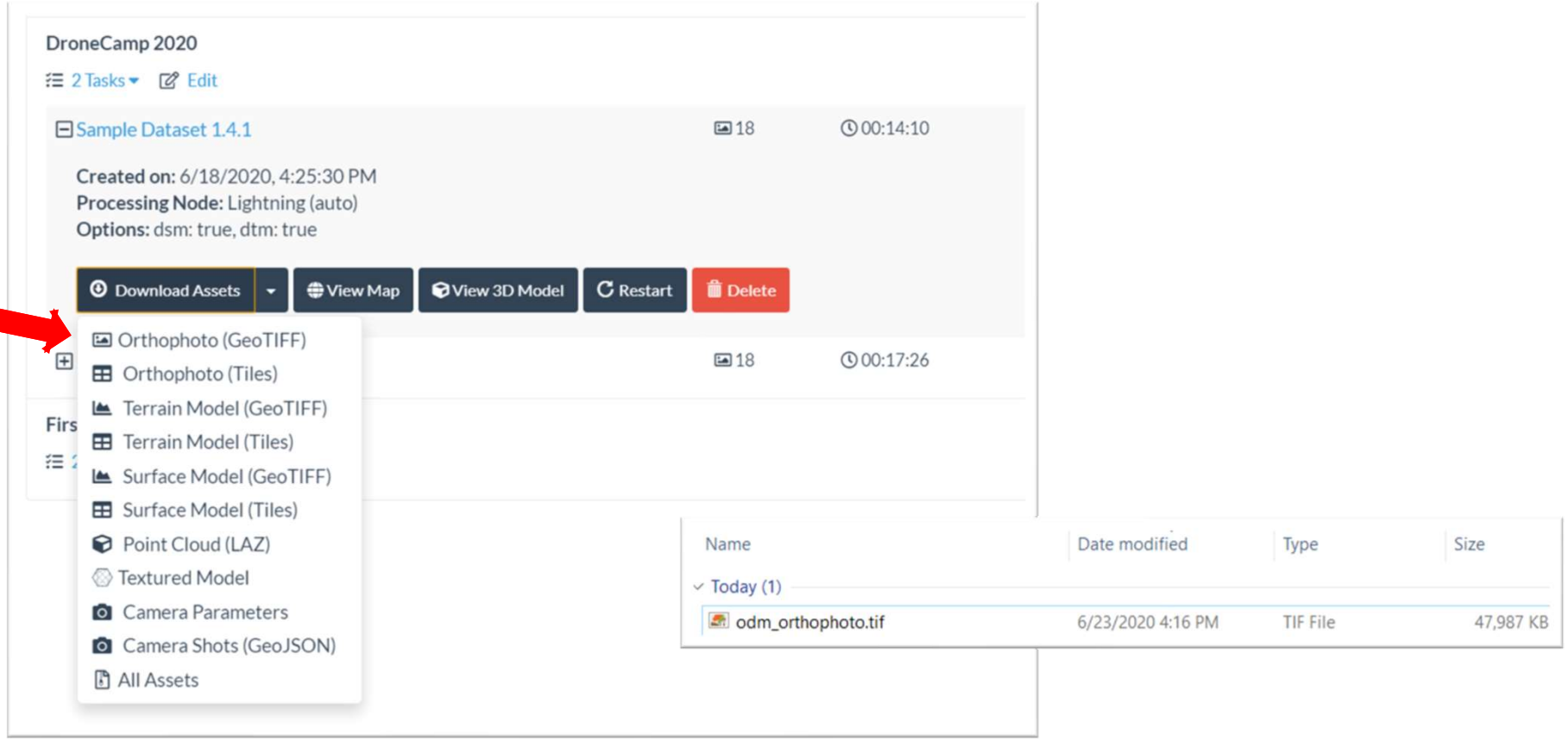
A. Find “Cameras” near the top of the tool menu
B. Click to expand, then click “Show Cameras”
C. Zoom out (scroll) until you see the blue squares floating above the scene
D. Note positions, angles of cameras
E. Click one camera to see the photo from that position



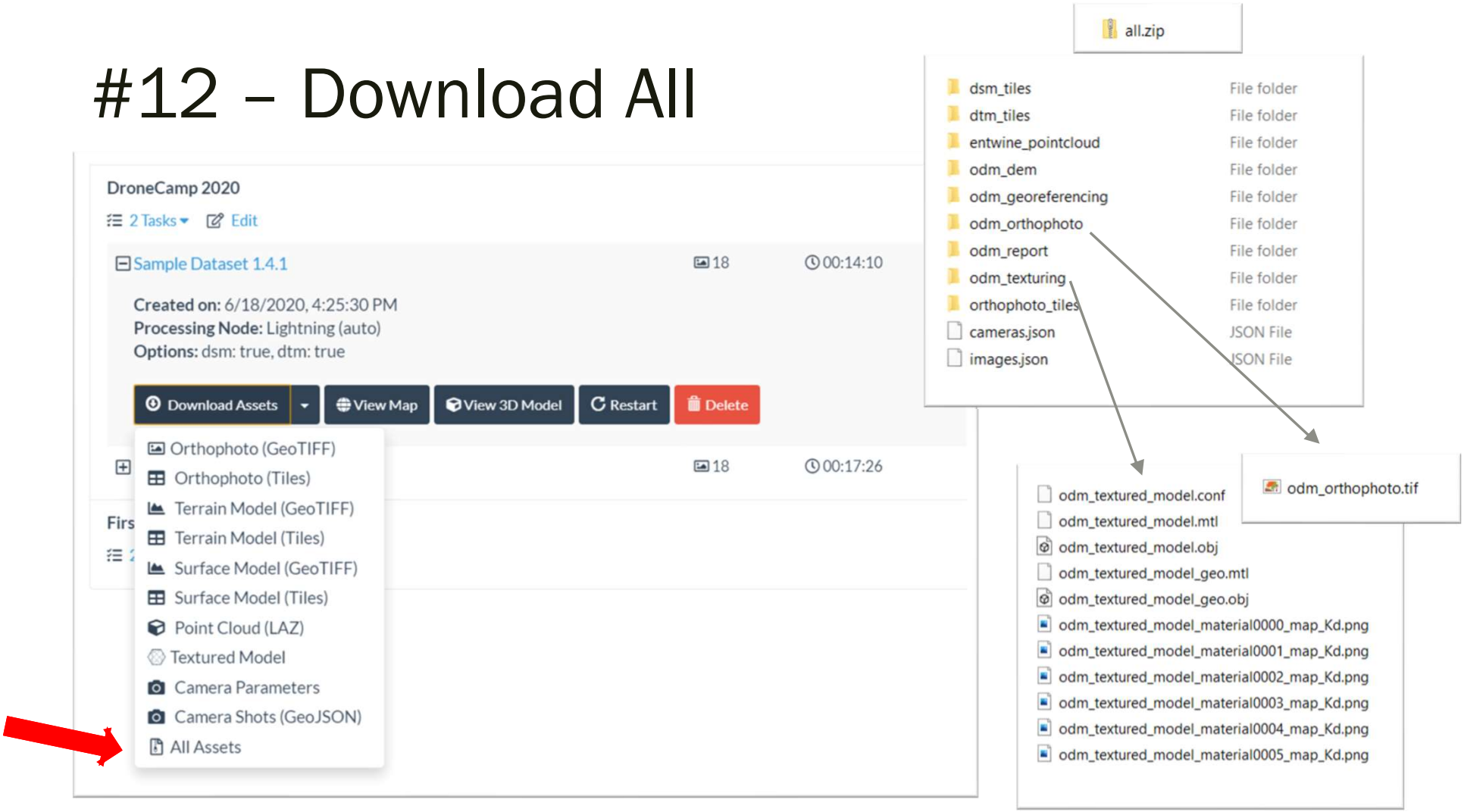
Exercises – Download



#11 – Download Orthophoto



#12 – Download All



END

Hands-On Exercises
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