I did a search on <https://discover.digitalglobe.com/> July 2018. These are some of the ims below. There were more from 2017.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Date | system | product | resolution | provider | Image Nadir | Sun Elev | cat\_ID |
| 2016/02/23 | Worldview3 | 8 band MS | 0.3m | DG | 27.1° | 52.9° | 1040010018976500 | |
| 2015/01/01 | Worldview2 | 8 band MS | 0.55m | DG |  |  | 103001003b657400 | |
| 2017/08/06 | Worldview3 | 8 band MS | 0.37m | DG | 24.6° | 34.4° | 1040010031309600 | |
| 2018/03/23 | Worldview2 | 8 band MS | 0.59m | DG | 26.7° | 46.1° | 1030010078253F00 | |
| 2017/10/01 | Worldview3 | 8 band MS | 0.34m | DG | 16.9° | 53.7° | 10400100338D2E00 | |

* It is good to have Image nadir as small as possible and Sun elevation as large (close to 90) as possible to avoid shadows, perspective distortions (worse for bigger image angles). The more orthographic/vertical the viewing geom, the less perspective distortions and probably the better the orthorectification. The more vertical the sun, the less shadows and possibly the less BRDF effects.
* It is possible shadows could provide some info relating to plant height, but this is a long shot and should probably not be used as a selection criterion, as I imagine one would lose more from the effect on plant colour than one would gain from shadow~plant height.
* The 2018/03/23 image was after some rain while the 2017/01/10 was still dry. It is difficult to know if new growth would assist biomass estimation. It could confuse things if there are a lot of grasses and small plants, which look very green / have high NDVI but contribute little to biomass. But how informative will NIR/NDVI be when the land is dry is also an unknown. Intuitively, I think it is better to go for the dry imagery as there will be less confusion with new grass etc.
* WV3 is preferable to WV2 as it has better spatial res.
* This leaves the 2017/10/01 WV3 image as our best option. It is recent although not the most recent, is dry and has the best viewing geometry. It has 8 bands.

Note WV multi-spec spatial res is 4xpan res which is ~1.2-1.4m. This is actually worse than NGI, which from what I can tell has 2xpan res, so 1m. This leaves the question as to whether WV3 will be an improvement on NGI.

**Radiometric Notes**

* All WV products are corrected for sensor/camera effects.
* <https://dg-cms-uploads-production.s3.amazonaws.com/uploads/document/file/207/Radiometric_Use_of_WorldView-3_v2.pdf>
* DG offers a proprietary Atmopsheric Compensation that they claim is v accurate. It is not clear which products this may apply to. I don’t think any products are delivered with it by default.

**In terms of orthorectification:**

* DG is fiddling with their terminology for these things.
* DG gives CE90 of 5m for basic (aka system ready) and ortho-ready standard (aka view ready). This is with GCP and image projected to a plane.
* DG standard imagery is warped with a coarse DEM and not suitable for further orthorectification. As I experienced with QB.
* DG ortho-ready standard comes with RPC’s and is not suited to physical / toutin model orthorect. But the RPC’s are more accurate than QB and one can still incorporate GCP’s with RPC. Only basic is suited to physical/toutin’s model.
* DG standard imagery has a min order size of 25km2 while basic imagery is unspecified but I think a whole scene based on past experience.
* See the paper “Assessing geometric accuracy of the orthorectification process from GeoEye-1 and WorldView-2 panchromatic images”.
* “In this way, using bias-corrected RPCs model and a single GCP, extremely accurate geopositioning results, clearly much better than those attained by using older satel- lites such as Ikonos or QuickBird, were reported by Fraser and Ravanbakhsh (2009) working on a stereo pair of GeoEye-1”
* NB “A complementary transformation based on a few GCPs is essential for attained the best accuracies” so we still need GCP’s
* Typical WV2 orthorect accuracies obtained in above paper are 0.5m. The RPC model on ORS2a is actually a bit better than Toutin on Basic. Larger off-nadir angles do affect accuracy slightly.
* “Bearing in mind these results, it seems reasonable to recommend the RPC0 model for the sensor orientation phase if steadied VHR satellite PAN images such as GeoEye-1 Geo and WV-2 ORS2A are used”
* The DEM quality also affects orthrect accuracy a bit. And this is exacerbated by the off nadir angle.

The GEF ROI is about 25km2. At LandInfo’s pricing of $19/km2, that is $475 ~ R6600 @ R14/$. Worth seeing if we can get a grant but a train-smash if we can’t.