Atmospheric Correction Software
Delivered by a SaaS for Smallsat Flocks

David P. Groeneveld, PhD • david@advancedremotesensing.com

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Example

Uncorrected top-of-atmosphere Reflectance

RESOLV-corrected Surface Reflectance

Satellogic (1m)

# What is RESOLV?

RESOLV is a...

- Software application to correct smallsat images to surface reflectance;

- Comprehensive solution delivering convenience, accuracy and reliability;

- No-delay correction to surface reflectance for each smallsat image;

- Efficient process requiring a fraction of the time for competing methods;

- SaaS maintaining each smallsat in calibration to counter orbital effects; and

- Solution verified to be accurate and reliable.*

* see Journal Papers that test this unique new solution.

Example
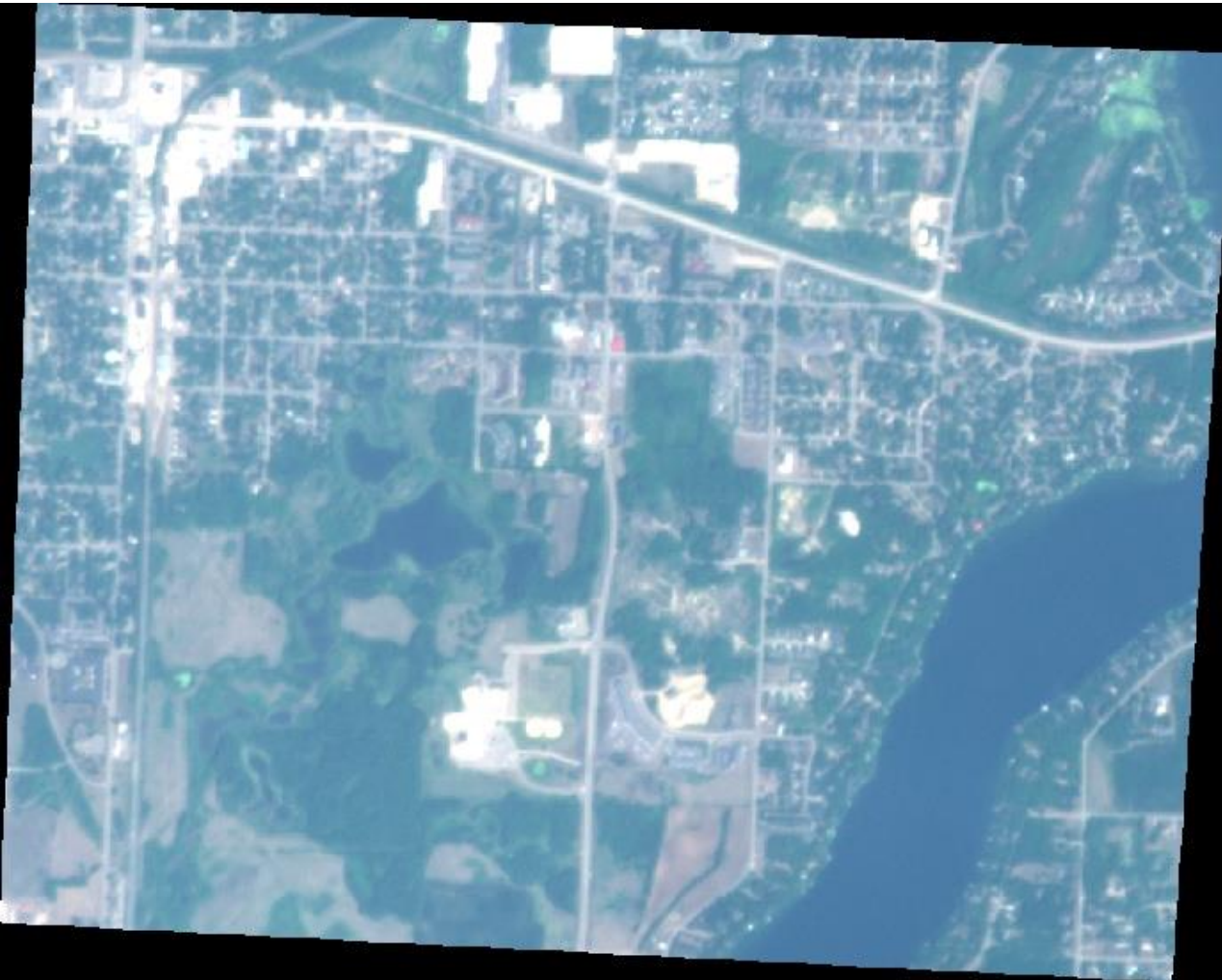
Uncorrected top-of-atmosphere Reflectance

RESOLV-corrected Surface Reflectance

PlanetScope (3m)
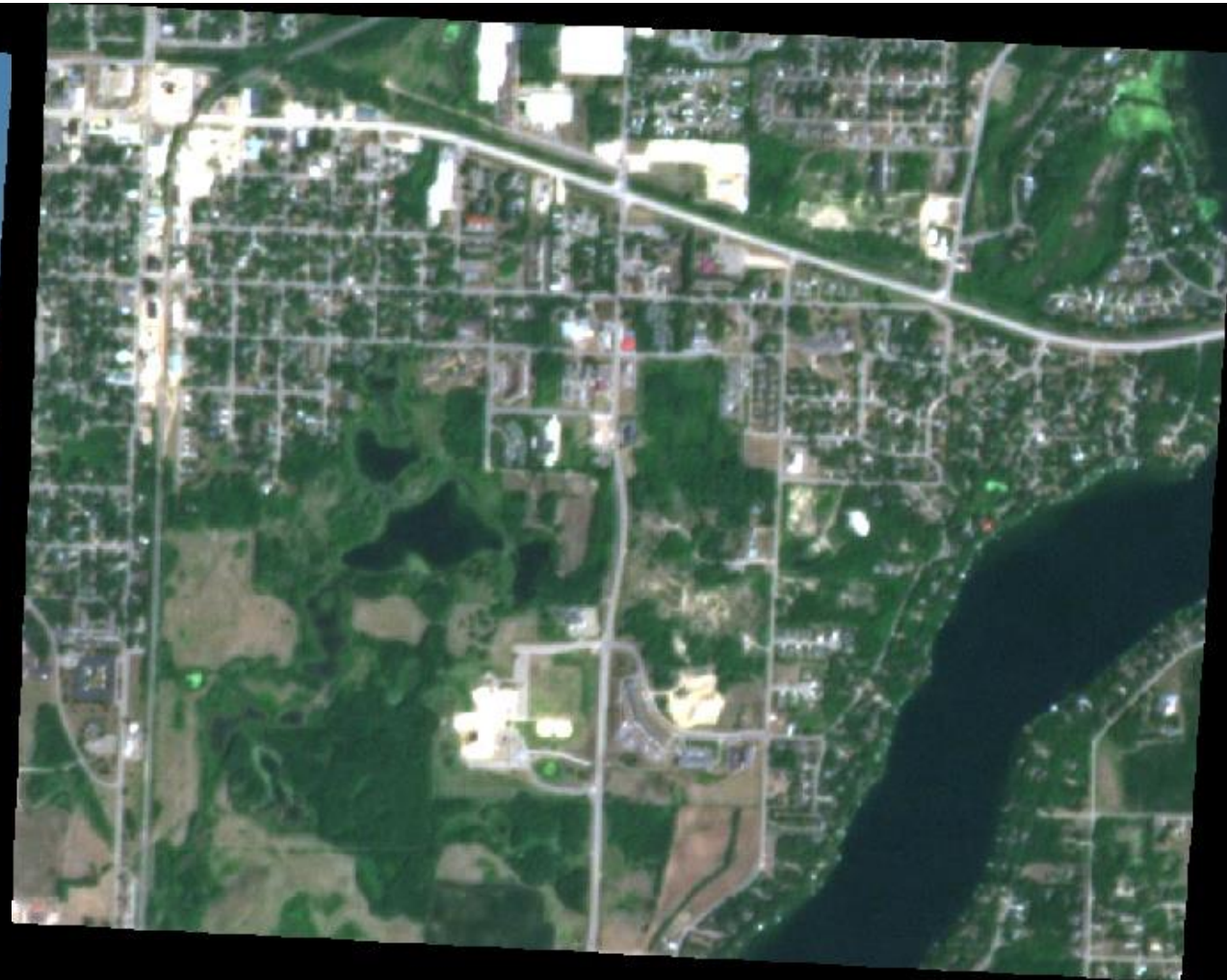
Why RESOLV?

Practicality: Outsourcing to the RESOLV SaaS achieves the best solution available.

Faster: Uses scene statistics – images can be processed/transmitted within minutes of download.

Better: The most accurate and robust atmospheric correction software.*

Cheaper: Retrieves more images and obviates staff attention to maintain the program.*

Convenience: Calibration for each smallsat delivered in a Docker Container to convert top-of-atmosphere data to surface reflectance for rapid and seamless application.

Enhanced Image Demand: Users want surface reflectance data – a standard that clears the image and restores the digital data for automated analysis (including AI).

Expand the Market: Accurate, no-delay surface reflectance is a game changer for smallsat data.

The Superior Solution, the Superior Alternative: Our software and support will help you deliver accurate surface reflectance retrieval in near real-time without delay.

*Compared to the existing methods for smallsats (radiative transfer and harmonized datasets)

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No-Cost Demo

- We will work with you to specify the images we need for calibration.

- We'll calibrate RESOLV for five smallsats and return a docker container with documentation for your verification and evaluation.

Software Enrollment

- RESOLV is offered for an annual fee per smallsat.

- Add any new smallsat for this service at any time after initiation.

- Operational RESOLV software has two components: Calibration and Correction.
  - Calibration contains fitted coefficients for each member of the smallsat flock.
  - Correction currently works for up to 8 bands. We can reconfigure for more and different bands, including hyperspectral data.

- The Correction ingests the image, reads the metadata, summons the Calibration File, performs the correction for each band, and outputs a configurable image package.

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RESOLV Pedigree

- RESOLV is the product of 6 years of research and development and applies the "Closed-form Method for Atmospheric Correction" (CMAC) algorithm by Advanced Remote Sensing, Inc.

- CMAC was prototyped using Sentinel-2 imagery, was confirmed for correction of Landsat 8/9 and has been applied to several different smallsat flocks.

- Through extensive comparisons, CMAC is verified to convert top-of-atmosphere reflectance to surface reflectance more accurately and for much greater levels of haze than NASA's industry-standard Land Surface Reflectance Code (LaSRC) combined with data harmonization.

- RESOLV overcomes the complexities of competing methods without the delay of ancillary data, correcting much higher levels of atmospheric aerosol.

- RESOLV is a simpler, more accurate, and more robust pathway for smallsat atmospheric correction than the NASA-proposed radiative transfer/data-harmonization pathway.

Uncorrected top of atmosphere   RESOLV-corrected Surface Reflectance

Sentinel-2, May 3, 2021, view of Playa Chachalacas, Veracruz, MX with smoke from fields burned prior to planting. For reference, the Sentinel-2 software, Sen2Cor cannot correct this image.

RESOLV-w is a solution that delivers surface reflectance over the ocean, now available only for testing.

The proposed standard to calibrate smallsats for atmospheric correction is Landsat's LaSRC software shown here compared to RESOLV–corrected and uncorrected Landsat 8.

LaSRC corrected

Uncorrected top of atmosphere

RESOLV-corrected Surface Reflectance

Kelowna, British Columbia (Landsat-8)