High-Res Landsat-8 satellite images for human density prediction

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1. Presentation
2. Landsat-8 imagery
   - Earth Covering
   - Image Georeferencement
   - Importing images
   - Image query
   - Image bands
3. Importing labels
4. Vegetation index extraction
   - NDVI extraction
   - NDVI evolution
   - Data to Machine Learning
5. Supervised Regression
6. Supervised Classification

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- Population census is expensive using conventional methods
  - 180 millions euros in France (officials,1999)
- How High-resolution satellites images could explain human density ?
- How to transform HR satellite images to explain human density ?

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Total earth covering defined by path,row grid pattern and achieved every 16 days

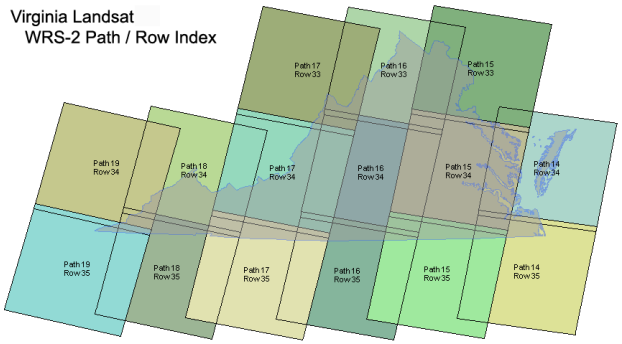

FIGURE : Landsat-8 grid covering (path,row) for Virginia (*USA*)

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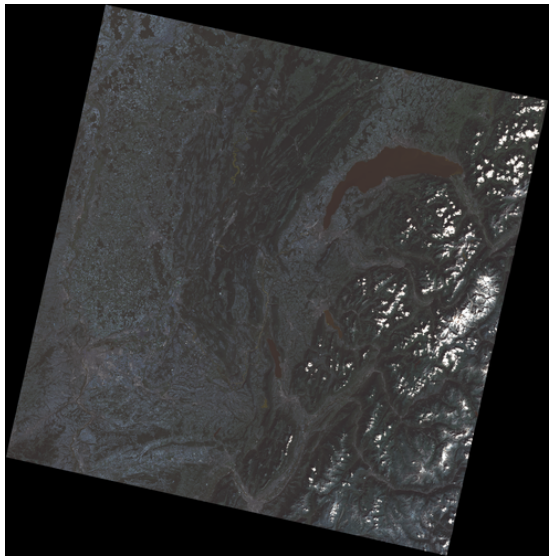
Landsat-8 images are georeferenced : each pixel has (x,y) coordinates in a certain Projection Coordinates System (*UTM Mercator*)



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coordinates

Landast-8 georeferencing can be checked comparing with another georeferenced source like *IGN* using a *SIG* (open source *QGIS*).

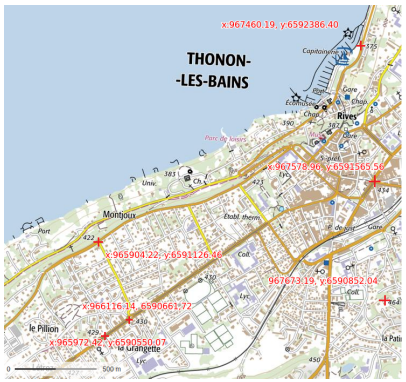

FIGURE : IGN georeferenced image from *Lambert* 93

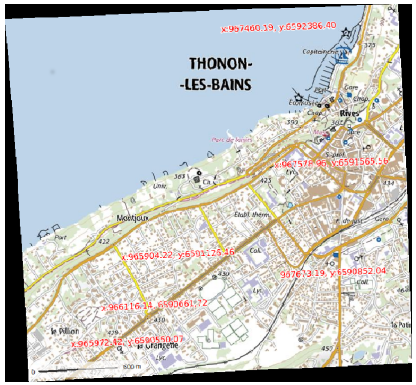

FIGURE : IGN georeferenced image to *UTM Mercator*

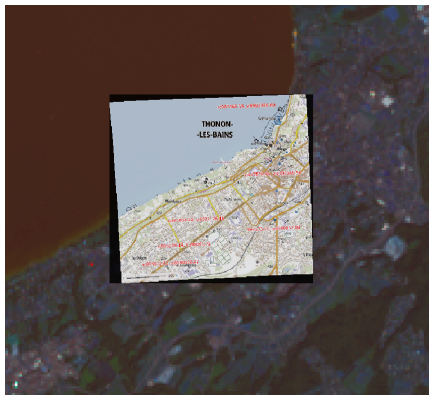

FIGURE : IGN georeferenced image (*UTM Mercator*) superposed with Landsat-8 georeferenced image (*UTM Mercator*)