



5. Additional Resources

Here we list additional resources we believe are useful. The focus is on open source tutorials, packages, and software for the topics focused on in this tutorial. In addition, we list papers we believe would be useful and relate to the material. This list will be updated as we find additional resources we find useful.

5.1 Tutorials

- Chris Holden's open source tutorial on Remote Sensing using R and Python. Including classification, calculations, and visualization:
 - <https://github.com/ceholden/open-geo-tutorial>
- Tutorials from Wageningen University on Remote Sensing analysis using R and Python:
 - <https://github.com/GeoScripting-WUR>
- Chris Holden's tutorial on searching for images, downloading, stacking, subsetting, and generating previews using Bash and Python:
 - https://github.com/ceholden/landsat_preprocess
- USGS page on Landsat data access:
 - http://landsat.usgs.gov/Landsat_Search_and_Download.php
- Downloading Landsat data via USGS GloVis:
 - <http://landsat.gsfc.nasa.gov/wp-content/uploads/2013/05/Make-Your-Own-Landsat-Image-Tutorial.pdf>
- Tutorial from Wageningen University using R to perform supervised (Random Forests) and unsupervised (k-means) classification:
 - <http://geoscripting-wur.github.io/AdvancedRasterAnalysis/#unsupervised-classification-k-means>
- Python course hosted online from Utah State University
 - <http://www.gis.usu.edu/~chrisg/python/2009/>
- QGIS Tutorials
 - <http://www.qgistutorials.com/en/>
 - http://hub.qgis.org/projects/quantum-gis/wiki/How_do_I_do_that_in_QGIS
- 5 part video tutorial on using QGIS's Orfeo Toolbox
 - https://www.youtube.com/watch?v=ReSbK-FS_P0

5.2 Software Packages

- Automated download of MODIS images:
 - https://github.com/jgomezdans/get_modis
- R package on Random Forests:
 - <https://cran.r-project.org/web/packages/randomForest/randomForest.pdf>
- Comparing R and Python for Random Forests classification:
 - <http://blog.yhathq.com/posts/comparing-random-forests-in-python-and-r.html>
- Scikit-Learn: Machine learning package for Python:
 - <http://scikit-learn.org/stable/index.html>
- Scikit-image: Image processing package for Python with various segmentation algorithms:
 - <https://scipy-lectures.github.io/packages/scikit-image/#image-segmentation>
- e1071: Widely used R package containing R's first support for Support Vector Machines
 - <https://cran.r-project.org/web/packages/e1071/e1071.pdf>
- Semi-Automatic Classification Plugin for QGIS:
 - <http://semiautomaticclassificationmanual.readthedocs.org/en/latest/>
- GRASS GIS: Open Source GIS with many types of raster and vector analysis including classification and segmentation:
 - http://grasswiki.osgeo.org/wiki/Image_classification
- OpenCV: Python package containing machine learning and image segmentation algorithms:
 - <http://opencv-python-tutroals.readthedocs.org/>
- Spring: Open source GIS from Brazil's National Institute for Space Research (INPE) for object-based image analysis:
 - <http://www.dpi.inpe.br/spring/english/>
- RHSEG (Recursive Hierarchical Segmentation): Free segmentation program from NASA:
 - <http://opensource.gsfc.nasa.gov/projects/HSEG/>
- Yet Another Time Series Model (YATSM) Python-based time series algorithm:
 - <https://github.com/ceholden/yatasm>
- bFastSpatial time series R package developed at Wageningen University
 - <https://github.com/dutri001/bfastSpatial>
- MODISTools - package for using MODIS data with R:
 - <https://github.com/seantuck12/MODISTools/>
- Raster - package for processing raster data in R:
 - <https://cran.r-project.org/web/packages/raster/raster.pdf>
- RGDAL - R binding for GDAL library
 - <https://cran.r-project.org/web/packages/rgdal/rgdal.pdf>
- "Essential Python Geospatial Libraries"
 - https://github.com/SpatialPython/spatial_python
- Python OGR/GDAL Cookbook - Tutorials on vector and raster analysis in Python
 - <https://pcjericks.github.io/py-gdalogr-cookbook/>
- Rasterio - Python package from MapBop for raster analysis

- <https://github.com/mapbox/rasterio>
- Cheat sheet for Rasterio, Fiona, and Shapely
 - <https://github.com/sgillies/frs-cheat-sheet>

5.3 Related Papers

- Original paper on FMask algorithm:
 - Zhu, Z., & Woodcock, C. E. (2012). Object-based cloud and cloud shadow detection in Landsat imagery. *Remote Sensing of Environment*, 118 (15), 83-94
- Original paper on Random Forests:
 - Breiman, L. (2001). Random forests. *Machine Learning*, 45, 5-32
- Original paper on Multivariate Alteration Detection:
 - Nielsen, A, Conradsen, K and Simpson, J. 1998. Multivariate alteration detection (MAD) and MAF post processing in multi-spectral bi-temporal image data: new approaches to change detection studies. *Remote Sensing of Environment*, 64: 1-19.
- Original paper on CCDC:
 - Zhu, Z., Woodcock, C. E., & Olofsson, P. (2012). Continuous monitoring of forest disturbance using all available Landsat imagery. *Remote Sensing of Environment*, 122, 75-91
- Good practices document from Dr. Olofsson
 - Olofsson, P., Foody, G., & Herold, M. (2014). Good practices for estimating area and assessing accuracy of land change. *Remote Sensing of Environment*, 148, 42-57.