

# Supplementary Material for HYDRAFloods Module 2

Optical Water Indices

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In the below table...

- “Red” represents radiance/reflectance in the red band
- “Green” represents radiance/reflectance in the green band
- “Blue” represents radiance/reflectance in the blue band
- “NIR” represents radiance/reflectance in the Near infrared band (0.85 - 0.88 microns on Landsat 8)
- “Swir1” represents radiance/reflectance in the first shortwave infrared band (1.57-1.65 microns on Landsat 8)
- “Swir2” represents radiance/reflectance in the second shortwave infrared band (2.11-2.99 microns on Landsat 8)

Index Name	Formula	HYDRAFloods Code	Reference
Modified Normalized Water Index (MNDWI)	$\frac{green - swir1}{green + swir1}$	Python hf.mndwi	<a href="https://doi.org/10.1080/01431160600589179">https://doi.org/10.1080/01431160600589179</a>
New Water Index (NWI)	$\frac{blue - (nir + swir1 + swir2)}{blue + (nir + swir1 + swir2)}$	Python hf.nwi	<a href="https://www.mdpi.com/2073-4441/13/12/1647">https://www.mdpi.com/2073-4441/13/12/1647</a>
General Water Index (GWI)	$(green + red) - (nir + swir1)$	Python hf.gwi	<a href="https://github.com/Servir-Mekong/hydra-floods/blob/master/hydrafloods/indices.py">https://github.com/Servir-Mekong/hydra-floods/blob/master/hydrafloods/indices.py</a>
Automated Water	$4.0 * (green - swir1) - ((0.25 * nir) + (2.75 * swir2))$		<a href="https://doi.org/10.1016">https://doi.org/10.1016</a>

Extraction Index No Shadow		Python hf.aewinsh	<a href="https://doi.org/10.1016/j.rse.2013.08.029">/j.rse.2013.08.029</a>
Automated Water Extraction Index with Shadow	$blue + 2.5 * green - 1.5 * (nir + swir1) - 0.25 * swir2$	Python hf.aewish	<a href="https://doi.org/10.1016/j.rse.2013.08.029">https://doi.org/10.1016/j.rse.2013.08.029</a>
Land Surface Water Index	$\frac{(nir - swir1)}{(nir + swir1)}$	Python hf.lswi	<a href="https://doi.org/10.1080/01431160802572653">https://doi.org/10.1080/01431160802572653</a>
Water Ratio Index	$\frac{(green + red)}{(nir + swir1)}$	Python hf.wri	<a href="https://doi.org/10.1109/GEOINFORMATICS.2010.5567762">https://doi.org/10.1109/GEOINFORMATICS.2010.5567762</a>
Multi Band Water Index	$(3 * green) - red - nir - swir1 - swir2$	Python hf.mbwi	<a href="https://doi.org/10.1016/j.jag.2018.01.018">https://doi.org/10.1016/j.jag.2018.01.018</a>

Modified Water Index	$1 - (NDVI - MNDWI)$	<div>Python hf.mwi</div>	<a href="https://ieeexplore.ieee.org/document/9011209">https://ieeexplore.ieee.org/document/9011209</a>
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