Metadata Sheet: Wetland Disconnectivity

(Indicator No. 6)

Title:	***Biodiversity and Habitat Loss - Wetland Disconnectivity***
Indicator Number:	***6***
Thematic Group:	***Ecosystems***
Rationale:	*Wetland disconnectivity is defined as the proportion of wetlands occupied by dense cropland or urban areas, assuming that human occupancy results in severing the natural physical and biological interconnections between river channels and their floodplains. Many cases of disconnectivity feature destruction and overt draining of wetlands to make them suitable for human use. Vast floodplain areas have been made dysfunctional by levee construction and river channelisation to protect urban areas. Wetland disconnectivity can lead to distortion of flow patterns and the loss of local flood protection, water storage, habitat, nutrient processing and natural water purification.*
Interlinkages:	*Wetlands are an essential part of catchment hydrology. The definition of wetlands includes rivers, lakes and near-shore marine areas, and boundaries cannot be clear-cut. Hence the obvious linkages with the other water systems. Depending on the gradient of the groundwater table and topography of the land surface, wetlands also perform the important function of aquifer recharge or discharge.*
Description:	Wetland disconnectivity is defined as the proportion of wetlands occupied by dense cropland or urban areas, assuming that human occupancy results in severing the natural physical and biological interconnections between river channels and their floodplains.
Metrics:	Charles J. Vörösmarty, Ellen M. Douglas, Pamela A. Green, and Carmen Revenga. Geospatial Indicators of Emerging Water Stress: An Application to Africa, Ambio, 34 (3): 230-236, 2005b. Lehner, B. & Döll, P. Development and validation of a global database of lakes, reservoirs and wetlands. J. Hydrol. 296, 1-22 (2004). Data set information available at http://www.worldwildlife. org/science/ data/GLWD _Data_Documentation.pdf; data available at: http://www. worldwildlife. org/science/data/item1877.html Eldridge, C. D. et al. Global distribution and density of constructed impervious surfaces. Sensors 7, 1962-1979 (2007). Available at http://www. ngdc.noaa.gov/dmsp/download_global_isa.html

	Ramankutty, N., Evan, A. T., Monfreda, C. & Foley, J. A. Farming the planet: geographic distribution of global agricultural lands in the year 2000. Global Biogeochemical Cycles 22, GB1003 (2008). Data available at: http://www.geog.mcgill.ca/~nramankutty/Datasets/ Datasets.html
Computation:	The indicator was computed as the Wetland Disconnectivity threat driver from Vörösmarty et al. 2010 over the TFDD basin-country-unit (BCU) and transboundary basin regions. Wetland areas were defined as Classes 3-10 of the Global Lakes and Wetlands Database (Lehner & Doll 2004); lakes and reservoirs (Classes 1 and 2) were excluded. The wetland area occupied by cropland was based on a global data set on agricultural lands (i.e., croplands and pasture) in use around the year 2000 (Ramankutty et al 2008); data on wetlands occupied by urban use was based on a global inventory of the distribution and density of constructed Impervious Surface Area (Eldridge et al 2007). Average Wetland Disconnectivity threat over the TFDD BCU and basin regions was calculated as the area-weighted average of the grid cells within each TFDD BCU and basin. Winsorization was applied to limit the weighting influence of a handful of small basins/BCUs comprised predominantly of grid cells with high wetland disconnectivity. Given the data was previously normalized on a 0-1 scale the winsorization was applied to the count of basins falling in equally spaced bins with the top 2.5% by count assigned as the range max value. For basin averages, the top 2.5% was applied at values of 0.725 and greater. For BCUs the top 2.5% was applied at values of 0.825 and greater. To maintain the integrity of the approach, only results for basins greater than 25,000 – 30,000 km2 can be provided with a scientifically credible level of certainty and thus used in the ranking system. Results for basins smaller than 25,000 – 30,000 km2 have been provided with the tabular information for reference only and were not used in the calculation of rankings. All data were computed in 30' latitude-longitude (i.e., 0.5° degree) gridded format in the Geographic projection over the TFDD BCU/transboundary basin regions.
Units:	See description

<table>
<tr><td>Scoring system:</td><td>Due to the standardized nature of the original Vörösmarty et al. 2010 datasets, risk categories were defined as 20% equal-interval classes with the lowest corresponding to very low relative risk and the highest corresponding to very high relative risk

The results for the Wetland Disconnectivity indicator are summarized below:

<table>
<tr><th>Relative risk category</th><th>Range (normalized score)</th><th>No. of Basins</th><th>Proportion of Basins</th><th>No. of BCUs</th><th>Proportion of BCUs</th></tr>
<tr><td>1 - Very low</td><td>0.00 – 0.19</td><td>69 (29*)</td><td>34%</td><td>196 (91*)</td><td>36%</td></tr>
<tr><td>2 - Low</td><td>0.20 – 0.39</td><td>78 (25*)</td><td>38%</td><td>141 (45*)</td><td>26%</td></tr>
<tr><td>3 - Moderate</td><td>0.40 – 0.59</td><td>28 (8*)</td><td>14%</td><td>101 (36*)</td><td>19%</td></tr>
<tr><td>4 - High</td><td>0.60 – 0.79</td><td>17 (7*)</td><td>8%</td><td>56 (20*)</td><td>10%</td></tr>
<tr><td>5 - Very high</td><td>0.8 – 1.00</td><td>13 (10*)</td><td>6%</td><td>48 (23*)</td><td>9%</td></tr>
</table>
* Number of basins/BCUs for which results have been calculated, but bear a lower level of confidence due to modelling limitations. See more in section ‘Computation’</td></tr>
<tr><td>Limitations:</td><td>The lack of detailed descriptive attributes in Class 3-10 items of the GLWD such as names or volumes may hamper analysis at level-2 scale; however GIS information could be derived from data sources other than remote sensing, including Ramsar site data in Ramsar Information Sheets (RIS) format.</td></tr>
<tr><td>Spatial Extent:</td><td>Global</td></tr>
<tr><td>Spatial Resolution:</td><td>30- X 30-min Lat X Lon</td></tr>
<tr><td>Year of Publication:</td><td>2010</td></tr>
<tr><td>Time Period:</td><td>2000</td></tr>
<tr><td>Additional Notes:</td><td></td></tr>
<tr><td>Date:</td><td>16.02.2015.</td></tr>
<tr><td>Format:</td><td>Excel spreadsheet</td></tr>
<tr><td>File Name:</td><td>TWAP_RB_indicator_06_results.xlsx</td></tr>
<tr><td>Contact person:</td><td>Charles J. Vörösmarty, Pamela Green</td></tr>
<tr><td>Contact details:</td><td>cvorosmarty@ccny.cuny.edu, pgreen.ccny@gmail.com</td></tr>
</table>