

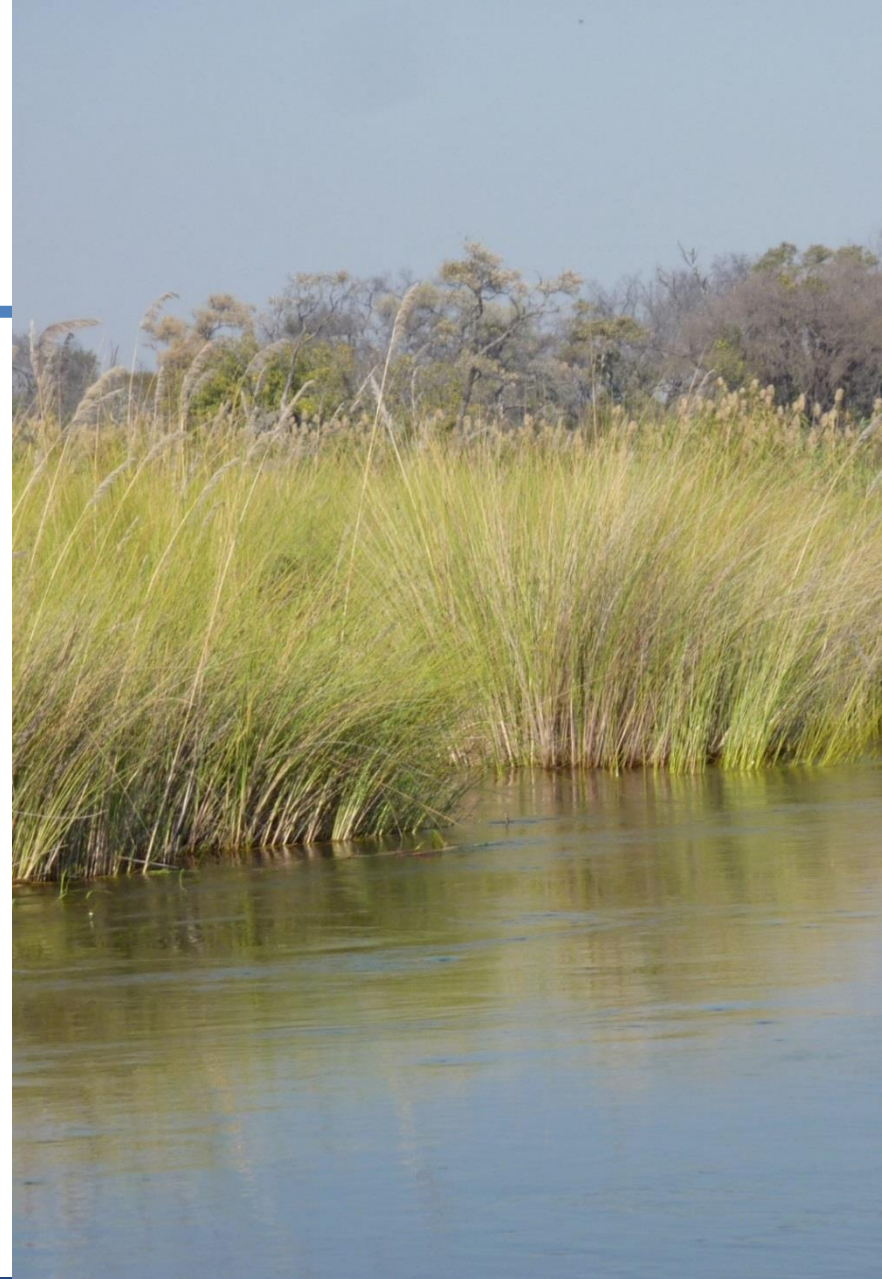
# Indicator 6.6.1 – health of water- related ecosystems

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**GEMS Water, 9 November 2016**



# Freshwater ecosystem health and the American election

Electoral vote

Popular vote

Clinton

218

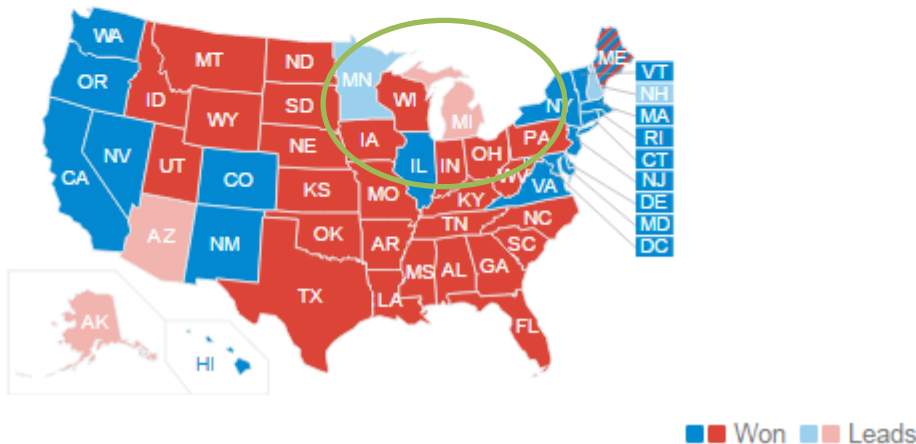
Trump

✓ 276

56,855,614 votes

57,600,953 votes

270 to win



**Great Lakes:** largest source of freshwater in the world

Post-industrial regions

Serious water pollution –  
Flint, Chicago,  
Fish, beaches, coastal  
wetlands in peril

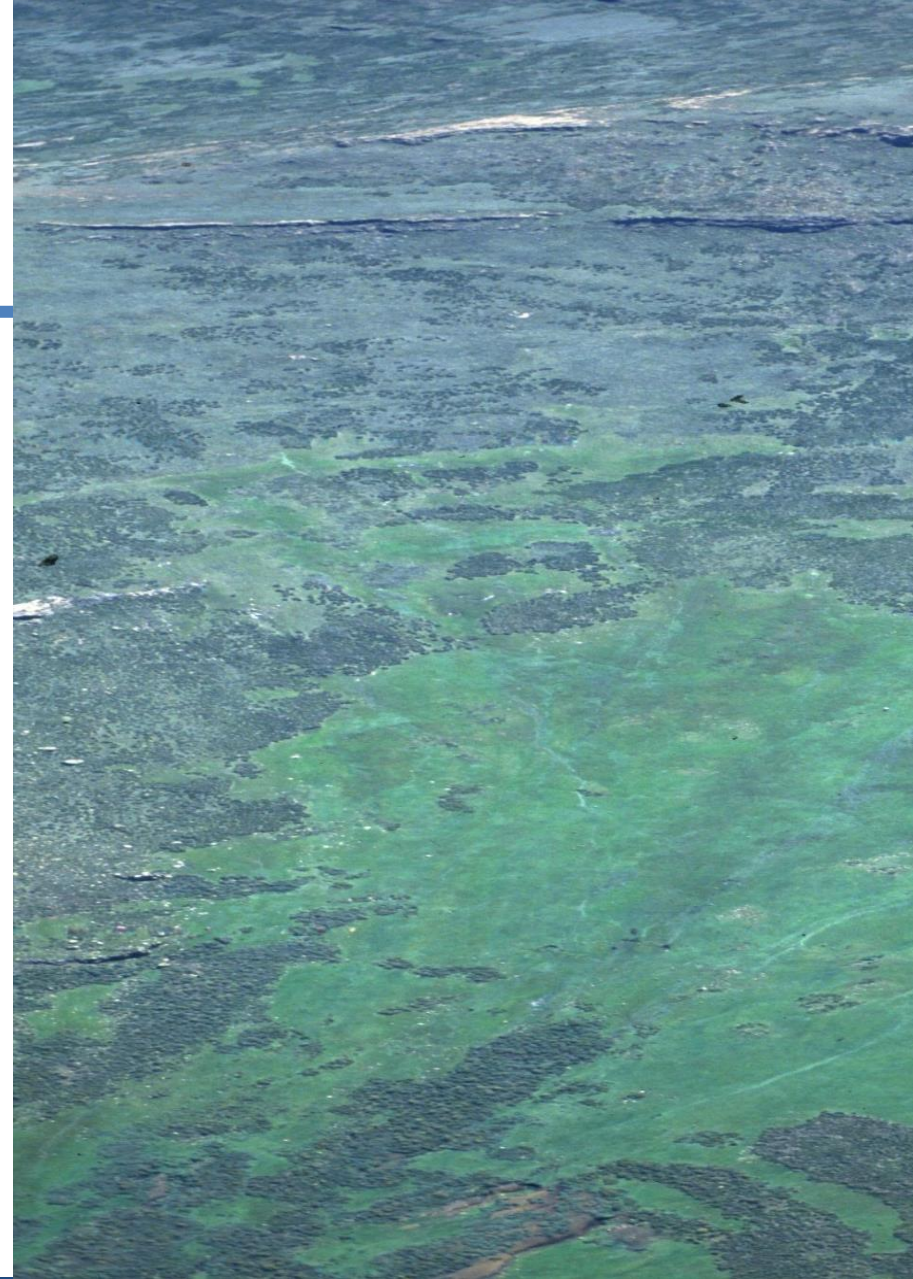
**Great Lakes States:**  
Indiana, Ohio,  
Michigan, Minnesota,  
Pennsylvania, Wisconsin

# SDG Indicator 6.6.1:

- **Target 6.6: By 2020 protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes**
  - *2020 synchronizes with the Aichi Biodiversity Targets of the CBD but will continue beyond that date to synchronise with the rest of the 2030 Agenda.*
- **Indicator 6.6.1: Percentage of change in water-related ecosystems extent over time.**
  - *Their spatial extent*
  - *The quantity of water contained within these ecosystems*
  - *The health or state of these ecosystems*

# What are water-related ecosystems?

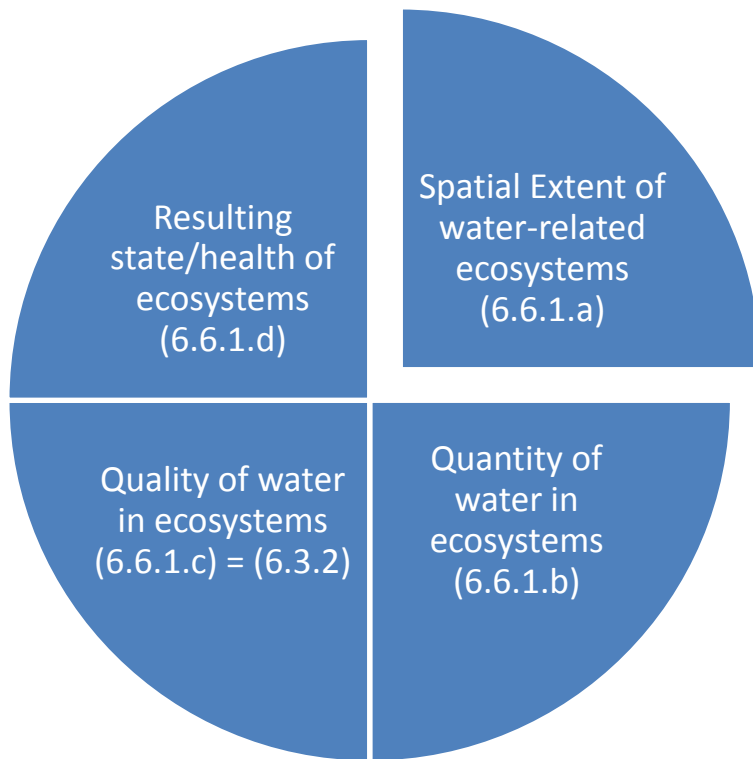
- Swamps, bogs, peat (palustrine wetlands)
  - Ponds, lakes (lacustrine wetlands)
  - Rivers, estuaries (lentic wetlands)
  - Mangroves
  - Forests
  - Drylands/deserts
  - Groundwater
- Ramsar definition: *lakes and rivers, underground aquifers, swamps and marshes, wet grasslands, peatlands, oases, estuaries, deltas and tidal flats, mangroves and other coastal areas, coral reefs, and all human-made sites such as fish ponds, rice paddies, reservoirs and salt pans*



# Ecosystems included

Ecosystem category	Extent indicator	Ecosystem health indicator
Wetlands (vegetation and water dominated ecosystems such as swamps, marshes and peatlands)	Spatial extent/area	Wetland health indices
Inland open waters (lakes and reservoirs)	Spatial extent/area and quantity (volume)	Lake health indices Water quality
Rivers and estuaries	Quantity (streamflow)	Biological indices, river health indices, water quality
Groundwater	Quantity (depth to groundwater table)	Groundwater interaction with surface water, water quality

# Indicator 6.6.1 – a framework for monitoring



Ecosystem category	Extent indicator	Ecosystem health indicator
Wetlands (swamps, marshes and peatlands)	Spatial extent/area	Wetland health indices
Inland open waters (lakes and reservoirs)	Spatial extent/area and quantity (volume)	Lake health indices
Rivers and estuaries	Quantity (streamflow)	Biological indices, river health indices
Groundwater	Quantity (depth to groundwater table)	Groundwater interaction with surface water

Sub-indicator	Data produced	Units of measurement
Change in the spatial extent of water-related ecosystems	Quantitative measure of wetland extent	% change in area (km <sup>2</sup> ) from reference condition
Change in quantity of water	Quantitative measure of river flow,  lake volume and  groundwater depth	% change in the volume of flow (Mm <sup>3</sup> ) from reference condition.  % change in volume (Mm <sup>3</sup> ) of water in lake  % change in depth (m) to groundwater
Ground based interpretation of Earth Observation data	Quantitative measure of wetland extent and also qualitative descriptions	% change in area (km <sup>2</sup> ) from reference condition
Ground based assessment of ecosystem extent and also classification of wetland type	Quantitative measure of wetland extent and also qualitative descriptions	% change in area (km <sup>2</sup> ) from reference condition
Change in health or state of ecosystem health	Quantitative measure of ecosystem health	% change of biological indicator from natural reference condition



Sub-indicator	Sub-indicator	Ref	Pres	Change	% change	% change
Change in the spatial extent of water-related ecosystems	Change in extent of palustrine wetlands	656 km <sup>2</sup>	439 km <sup>2</sup>	217 km <sup>2</sup>	-33	-30.5
	Change in extent of floodplain wetlands	110 km <sup>2</sup>	79 km <sup>2</sup>	31 km <sup>2</sup>	-28	
Change in the quantity of water in water-related ecosystems	Change in river flow	108 Mm <sup>3</sup>	93 Mm <sup>3</sup>	15 Mm <sup>3</sup>	-14	-8.3
	Change in lake volume	1121 Mm <sup>3</sup>	1087 Mm <sup>3</sup>	34 km <sup>2</sup>	-3	
	Change in groundwater depth	32 m	35 m	3 m	-8 <sup>#</sup>	
Change in the health of water-related ecosystems	Change in river health	156 index score	123 index score	33 index score	-21	-15.3
	Change in estuary health	8.0 index score	6.2 index score	1.8 index score	-23	
	Change in lake health	33 index score	32.3 index score	0.66 index score	-2	
<b>TOTAL CHANGE (AVERAGE)</b>						<b>-18</b>

# 6.6.1 Data collection

- Biophysical data on extent-and quantity are available for the freshwater ecosystems listed in the majority of the countries but with temporal gaps;
- Wetland extent is computed through the existing Living Planet Index methodology for data collection and analysis (<http://www.livingplanetindex.org/home/index>).
- EO data are universally freely available, and can be used by national institutions at a relatively low cost.
- The collection of data is possible through the collaboration of international and national institutions (UNEP (GEMS Water); GRDC; UNEP-WCMC and Convention on Biological Diversity; Convention on Combatting Desertification; Ramsar; ESA and NASA, GEO/GEOSS, and National Governments and other organisations).
- Downscaling to the national level is undertaken on the UNEP Live platform with the relevant national institution in the Indicator Reporting and Information System.

# GEMI Current work taking place

- **Methodology guide for implementation** is being finalized to be applied in 5 maybe 6 initial roll-out countries for SDG 6 indicators 6.3.1 through 6b (UN-Water coordinated GEMI project).
- 2017: around 60 more countries involved in the project activity for roll-out – each indicator have more
- 2017: Capacity development material prepared and used in supporting the participating countries
- 2018: Data repository and web portal ready and functioning at national and global level
- Early 2018: SDG 6 Synthesis Report – HLPF July 2018
- End 2018: Global baseline prepared and reported