

EOLakeWatch: Satellite observations for lake monitoring

2002 Algal Bloom Report - Lake Erie

Satellite-derived algal bloom indices for Lake Erie have been estimated using data from the European Space Agency's OLCI (Ocean Land Colour Instrument) for 2016 to present, and MERIS (Medium Resolution Imaging Spectrometer) for 2002 to 2011.

Daily bloom indices are derived from 14-day rolling-average satellite data products. Annual bloom indices are reported as the averages and maxima over the June to October monitoring period.

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Table 1. Lake Erie algal bloom graphs (June to October)

Bloom Index	2002 Daily Indices	Annual Indices
Bloom Extent (km ²) & (% of lake area)		
Bloom Intensity (µg/L)		
Bloom Severity (µg/L km ²)		

*2002 to 2018 average. No data available from 2012 to 2015.

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Table 2. Lake Erie bloom index map products (2002)

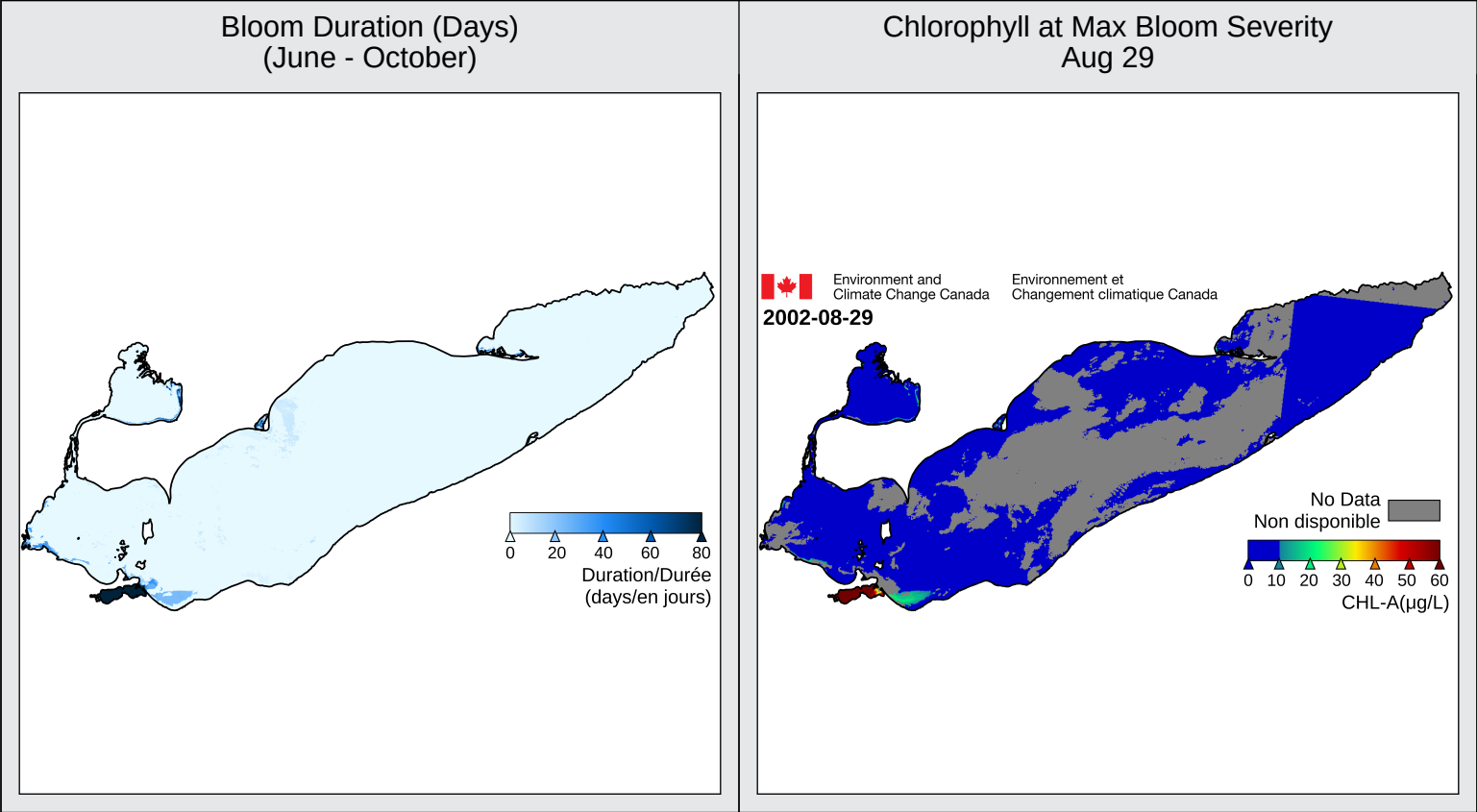


Table 3. Lake Erie 2002 bloom indices (June to October)

Bloom Indices									
Year	Average				Maximum				
	Extent km ² (% of lake area)	Intensity µg/L	Severity x10 ³ µg/L km ²	Duration days	Extent km ² (% of lake area)	Intensity µg/L	Severity x10 ³ µg/L km ²	Day of Max Severity	Duration days
2002	185 (0.7)	31.9	6.1	29	305 (1.1)	48.2	10.4	Aug 29	132
Avg*	446 (1.7)	33.0	13.4	24	1,269 (4.8)	53.5	38.2	Sep 13	146

*2002 to 2018 average. No data available from 2012 to 2015.

Table 4. Terminology

Bloom Index	Description
Bloom Flag	A per pixel bloom flag is raised when Chlorophyll > 10 µg/L
Bloom Extent	Total area of pixels flagged as bloom (km ² or % of lake area)
Bloom Intensity	Average chlorophyll concentration within area flagged as bloom (µg/L)
Bloom Severity	Bloom Intensity x Bloom Extent (µg/L km ²)
Bloom Duration	Number of days a pixel is flagged in bloom (days)



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Appendix. Annual average and maximum bloom indices (June to October)

Bloom Indices									
Year	Average				Maximum				
	Extent km ² (% of lake area)	Intensity µg/L	Severity x10 ³ µg/L km ²	Duration days	Extent km ² (% of lake area)	Intensity µg/L	Severity x10 ³ µg/L km ²	Day of Max Severity	Duration days
2002	185 (0.7)	31.9	6.1	29	305 (1.1)	48.2	10.4	Aug 29	132
2003	447 (1.7)	35.2	13.2	28	1,401 (5.2)	58.2	33.4	Sep 21	146
2004	236 (0.9)	33.8	7.6	21	455 (1.7)	53.3	14.6	Sep 21	150
2005	221 (0.8)	37.2	8.0	30	419 (1.6)	54.1	12.7	Sep 07	150
2006	285 (1.1)	32.9	8.8	27	711 (2.7)	52.0	21.6	Aug 25	148
2007	305 (1.1)	34.7	9.6	20	638 (2.4)	53.1	14.0	Sep 15	149
2008	499 (1.9)	34.1	16.0	24	1,573 (5.9)	49.0	59.8	Sep 12	150
2009	434 (1.6)	32.7	12.0	16	1,625 (6.1)	59.9	31.9	Sep 07	148
2010	448 (1.7)	28.5	12.0	22	1,207 (4.5)	42.3	34.0	Sep 22	142
2011	1,663 (6.2)	27.2	47.7	25	5,257 (19.7)	44.8	176.4	Oct 19	146
2016	238 (0.9)	36.8	8.4	24	609 (2.3)	56.6	20.6	Aug 23	153
2017	553 (2.1)	36.7	18.0	21	1,725 (6.5)	65.6	55.0	Sep 25	150
2018	279 (1.0)	27.6	7.3	19	572 (2.1)	59.0	12.4	Sep 12	133
Avg*	446 (1.7)	33.0	13.4	24	1,269 (4.8)	53.5	38.2	Sep 13	146

*2002 to 2018 average. No data available from 2012 to 2015.

ECCC EOLakeWatch algal bloom indices are produced using remote sensing data from the Envisat MERIS and Copernicus Sentinel-3 OLCI missions. Data made available by the European Space Agency (ESA).

