



# Assessment of Nitrogen and Carbon compounds emission as aftermath of wildfires in Dniester Delta (Ukraine) in 2010-2019

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## Introduction

Reed-beds and aquatic plants are among main nitrogen (N) and carbon (C) depots in the Dniester Delta capable to accumulate up to 10-15% of N from total annual riverine discharge. No assessment of N and C gaseous compounds' emission resulting from wildfires/burnings in river deltas have been performed until now. This study aim is the first assessment of N and C emissions as the result of wildfires in Dniester Delta.

## Approach and methodology

Study region is Dniester Delta (Ukraine). LandSat multispectral images were used to digitalize wildfire zones area according to methodology (Medinets et al., 2019). Experimental data on N and C content in reed and its biomass (Yakubovskiy et al., 1975; this study) were used to calculate emissions.

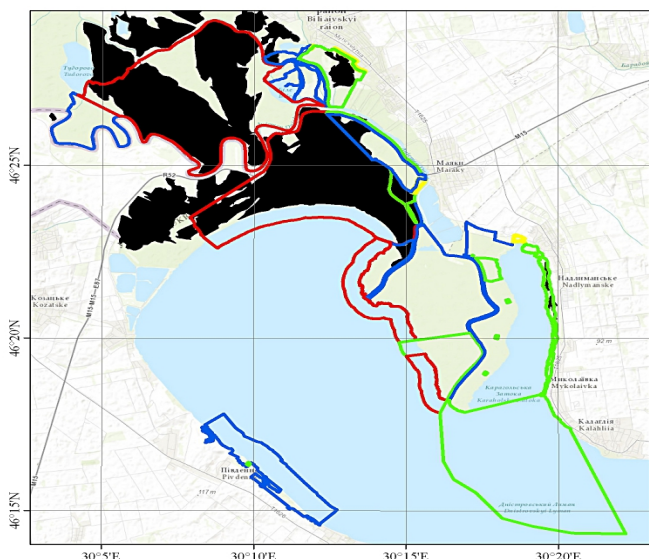


Figure 1 Example of schematic map of the wildfire traces (black) mapped using space images of the Dniester Delta for autumn-spring periods of 2015-2016

## Results and Discussion

We found that average wildfires area for 2010-2019 was equal to 4150 ha (range: 326-11093 ha), which made on average 10% of total delta area. Based on our estimates we suppose that N and C emission as wildfires aftermath can be important pathway of N and C removal from deltaic areas (Table 1).

Table 1: N and C emission from wildfires in the Dniester Delta in 2010-2019

October -April	Burned area , ha	N-emission , MgN	C-emission, MgC
2010-2011	2883	1932	63426
2011-2012	5852	3921	128737
2012-2013	1202	805	26433
2013-2014	6892	4617	151615
2014-2015	326	219	7176
2015-2016	11093	7432	244042
2016-2017	4054	2716	89186
2017-2018	1183	793	26033
2018-2019	5663	3794	124579
Total 2010 -2019	39147	26228	861227
Average	4350	2914	95692

Thus we state that wildfires (as important N and C emission source to the atmosphere) cannot be neglected upon C and N balance assessments at regional and global scales.

## Conclusion

The first estimation of N and C compounds emission from wildfires in Dniester Delta showed that average fluxes into atmosphere made ~3 GgNyr<sup>-1</sup> and ~96 GgCyr<sup>-1</sup> respectively, and should be accounted in N and C balances/ budgets for this region.

## Acknowledgements

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**References:** Medinets V, Gazyetov Ye, Pavlik T, Medinets S, Kovalova N 2019 Assessment of Fire Zones Area in the Dniester Delta in 2007-2019. Abstracts of Intern. Scien. Conf. (Kharkiv April 17-18 2019) 83-86 (in Ukrainian); Yakuboskiy K, Merezgko A, Shiyani P 1975 Accumulation of nutrients and pesticides by reed and rush. In Formation and quality control of surface waters (Kiev: Naukova dumka) 109-115 (in Russian)