

BULK TOTAL NITROGEN DEPOSITION WITHIN LITORAL-HIGHLANDS COUNTY, CROATIA, 1996-2008

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INTRODUCTION: Complex orography plays an important role in deposition of acidic species within the County: local washout of the atmosphere in the wider urban area of Rijeka, and higher precipitation depth in the background Highlands District. Time trends in bulk total nitrogen ($\text{NH}_4^+ + \text{NO}_3^-$) deposition at four selected sites are presented: remote Site 1, urban and industrial Site 2 (Rijeka), while Site 3 and Site 4 are located in the highlands area, claimed to suffer from acidic deposition.

RESULTS AND DISCUSSION

Except a slight increase at Site 3, there is hardly any trend in bulk total-N deposition over the area studied.

MATERIALS AND METHODS

Sampling: Bulk samples, open polyethylene buckets

Analyses: spectrophotometrically, LDL= 0.2 mg/L for nitrates and LDL=0.1 mg/L for ammonium.

Location of sampling sites is given on Figure 1



Figure 1: Location of sampling sites: Site 1 – remote island site, 250 m a.s.l.; Site 2 – urban site, 20 m a.s.l.; Site 3 – small town, 700 m a.s.l.; Site 4 – hunting resort, 930 m a.s.l.

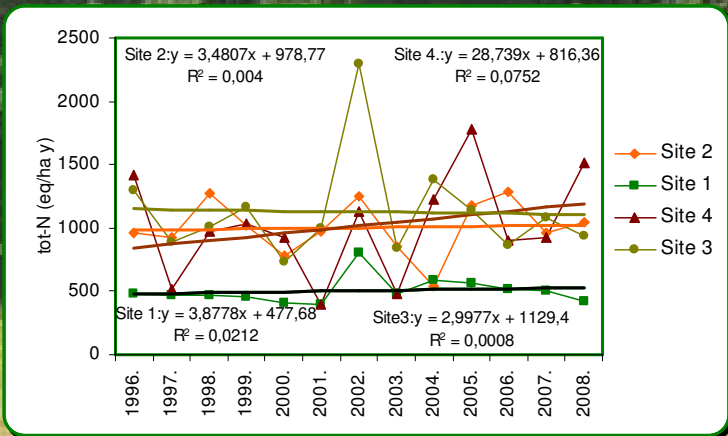


Figure 2: Deposition of bulk total-N in the area studied

Since 2004 the ratio $\text{N-NH}_4^+/\text{total-N}$ declined from 2/3 to 1/2, (Figure 3) due to increase in N-NO_3^- deposition (Figure 4).

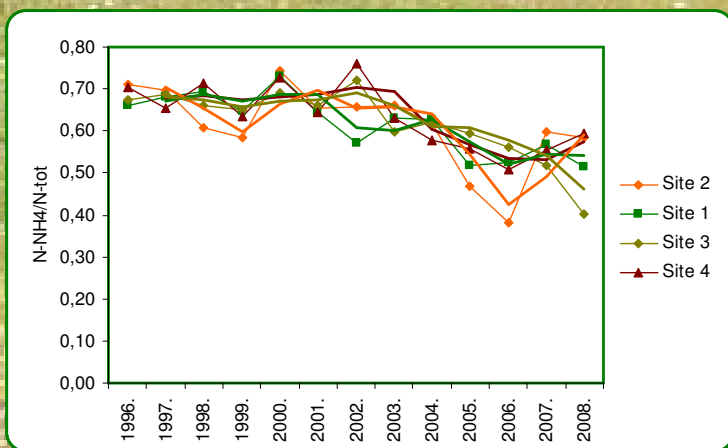


Figure 3: $\text{N-NH}_4^+/\text{N-total}$ ratio with corresponding 2-y running mean

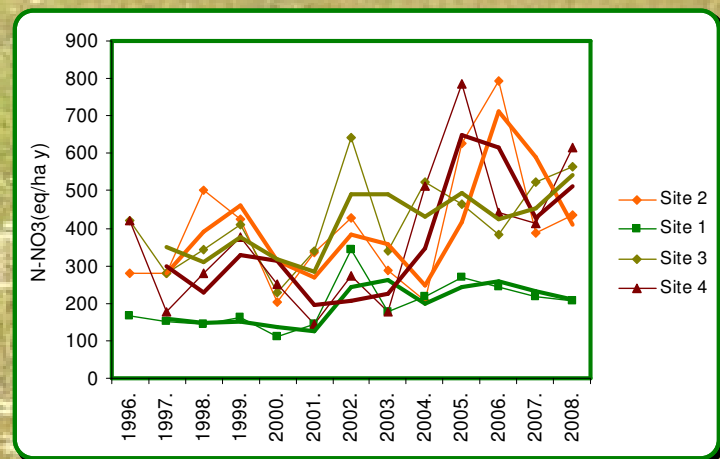


Figure 4: Deposition of N-NO_3^- with corresponding 2-y running mean

Soil-vegetation type at Sites 3 and 4: Calcic cambisol and redzina with $\text{CL}_{\text{tot-N}} = 4603 \text{ eq/ha y}$ that was not exceeded. The exceedence might occur at the most susceptible area with $\text{CL}_{\text{tot-N}} = 1745 \text{ eq/ha y}$, in 2002, due to severe Saharan sand episode that caused an unusually high deposition of tot-N.

CONCLUSION: The 12-year survey of bulk total-N deposition detected the change of $\text{N-NH}_4^+/\text{tot-N}$ ratio, due to increase of N-NO_3^- deposition since 2004 presumably due to higher use of diesel fuel in the wider region. No exceedences of CL values for tot-N were observed since, but data on dry deposition are missing.