

NATURE - Pollution around our school



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What was our goal?

- to gain the information about the environment around our school with help of various technologies

4 aspects we focused on were:

1. the purity of water measured by using a measuring tube
2. the quality of climate by researching spruce fir needles
3. the quality of climate by researching lichen
4. the rubbish dumped around our school

1) The level of water pollution of Ředice and Poběžovice brook and their comparison

- **The goal**: To prove or deny differences of measurement between water pollution in town and in the country off the town
- **The tools** : a note, a pencil , a cut plastic bottle, a measuring tube



- **Procedure:** We took water samples at given locations (at least 3 times for more accurate results) using plastic container. Then we poured water into the measuring tube. We observed a special black-and-white bottom of the tube and kept pouring water until it reached the borderline of visibility of the black-and-white pattern.



The view from above into the measuring tube



We read and set the final results according to the measure tape attached to the tube

Ředice brok - map

Results

- A) 53 cm, 42 cm, 59 cm (average 51 cm)
- B) 24 cm, 43 cm, 54 cm (average 40 cm)
- C) 68 cm, 69 cm, 74 cm (average 70 cm)
- D) 34cm, 23 cm, 21 cm (average 26 cm)
- **Total average: 47 cm**



Poběžovice brook - map

Results

- A) 43 cm, 47 cm, 51 cm (47 cm)
- B) 38 cm , 31 cm , 35 cm (31 cm)
- C) 46 cm, 44 cm, 38 cm (43 cm)
- **Total average: 40 cm**



Conclusion

- We found out that the results are influenced by the amount of water in the brook. Since there was a shortage of water during our measurement, our results might be affected (e.g. by moving dirt of bed).
- Ředice brook which flows through a city got **47 cm**.
- Poběžovice brook, which flows mainly through countryside got **40 cm**.
- It is obvious from the results, that the difference between pollution in Holice and its surroundings is quite significant.
- We can assume, that the difference would be even more apparent in a bigger cities.

2) Estimating of air quality using lichens

- **The Goal**: to find out airpollution in Holic town using lichens.
- Lichens can indicate airpollution thanks to their sensitivity. Lichens especially cannot stand sulphur dioxide, fluorine, bromine and heavy metals.
- The most resistant lichens are those with crustose thallus (up to $170 \mu\text{g SO}_2/\text{m}^3$ of air)
- Lichens with foliose thallus (up to $70 \mu\text{g SO}_2/\text{m}^3$ of air)
- The least resistant are lichens with fruticose thallus (up to $35 \mu\text{g SO}_2/\text{m}^3$ of air)
- **The tools**: a pencil, paper, a camera and GPS

Map - lichen



Lecanora muralis



- Crustose lichen

Xanthoria parietina



- Filiose lichen

Hypogymnia Physodes



- Filiose lichen

Conclusion

- During our monitoring we manage to locate 3 kind of lichens.
- The biggest number of lichens (including lichens with leafy thallus) we found in parks or distant places that are not close to roads.
- Lichens grow even near very busy roads, but only the really resistant ones with crustose thallus e.g. *Lecanora muralis*.
- We manage to prove that in parks and not so busy places, air is much cleaner. In these places lichens occur much more often and create larger covers. That means predisposed lichens can grow here.

3) Estimating of the air quality via spruce needles

- **Procedure**: We explored spruce needles on ten trees in different places all over Holicice.
- For each tree we counted how long the needles are growing on the branches and through that we found out how good the quality of the atmosphere is in particular parts of Holicice.



The tree no. 1

- Location: close to school, on the periphery of the city, close to major roads
- Number of years: 6

The tree no. 2

- Location: close to the gas station, near a busy road
- Years: 2





The tree No. 3

- Location: behind an apartment building, further from the city centre
- Years: 7

The tree No. 4

- Location: between apartment buildings, further from the city centre
- Years: 6





Tree No. 5

- Location: next to the Sports hall, in the city centre
- Years: 6

Tree No. 6

- Location: in the city centre, between kindergarten old Sokol house/gym
- Years:7



The tree No. 7

- Location: close to a busy road, quite in the city centre
- Years: 4

The tree No. 8

- Location: the city park in the middle of the town square, next to the main roads
- Years: 4





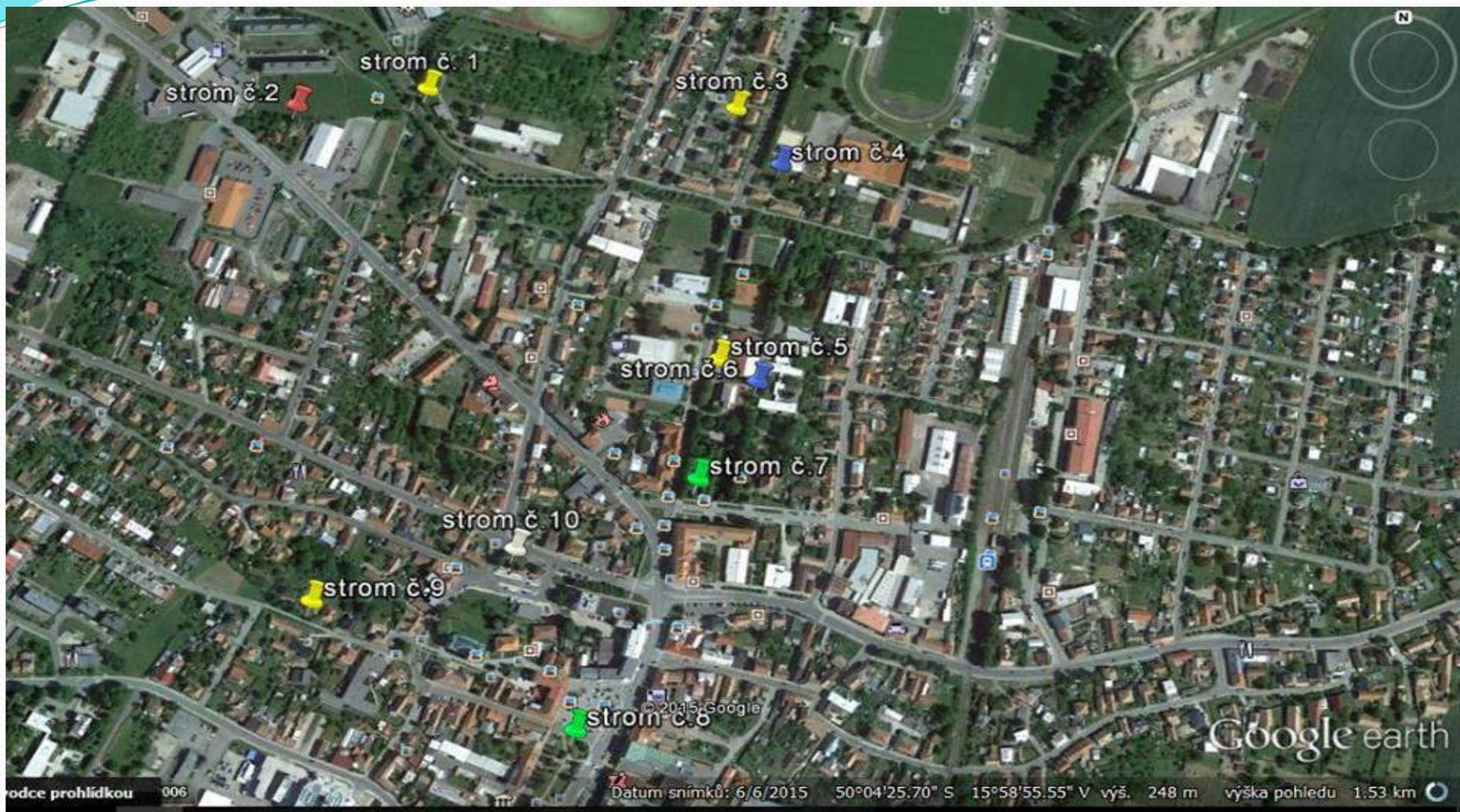
The tree No. 9

- Location: near a family house in the suburbs
- Years: 6

The tree No. 10

- Location: bus station in the city centre
- Year: 1





White pin – 1 year, red pin – 2 years, green pin – 4 years, yellow pin - 6 years,
blue pin - 7 years

Summary

- The lowest values were measured at the bus station
- Better, clearer air is in the city park in the middle of the square
- The best air in our city is in the outlying residential areas

4) The rubbish around our school

- The surroundings of our school is quite clear, we don't have any pollution problems here and either much garbage.
- There are no black landfills.
- People in Holicice are used to sort the waste and use services of dumping .
- Around our school there are a lot of rubbish bins including those for dog excrements.

View from our school's roof



Ředice brook - rabbish

Rubbish bin on dog excrements

Thank you for your
attention 😊