# Mercury Contaminated Sites – Chemical Industry Legacy in CEE Region

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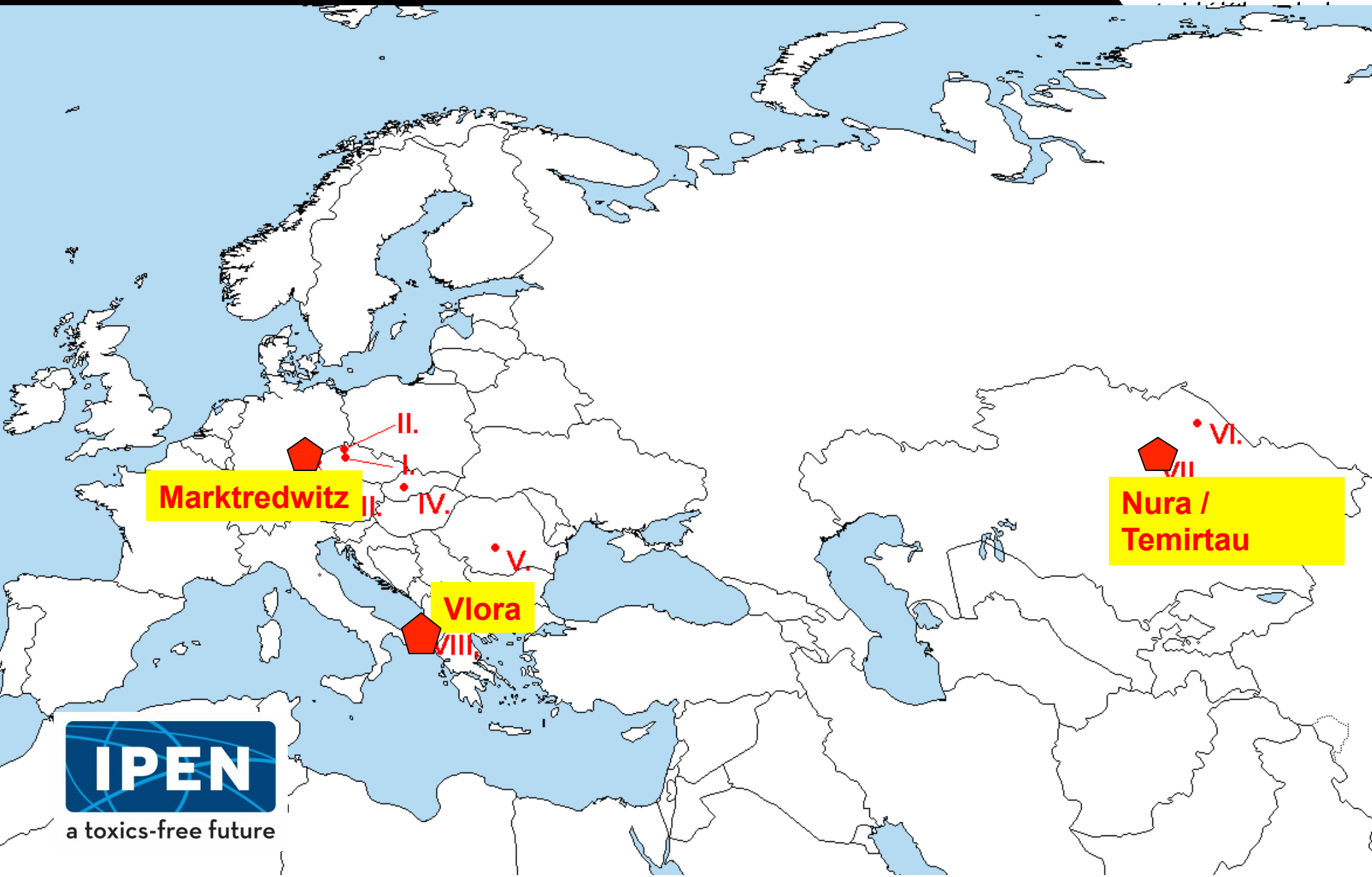
# Mercury Contaminated Sites in CEE Region

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# Research and monitoring studies in CEE

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**Chemical Plants as a Significant Source of Mercury Contamination in the CEE Region (2015)**

http://english.arnika.org/kazakhstan/publications

**Contaminated Sites and Their Management. Case studies: Kazakhstan and Armenia (2015)**

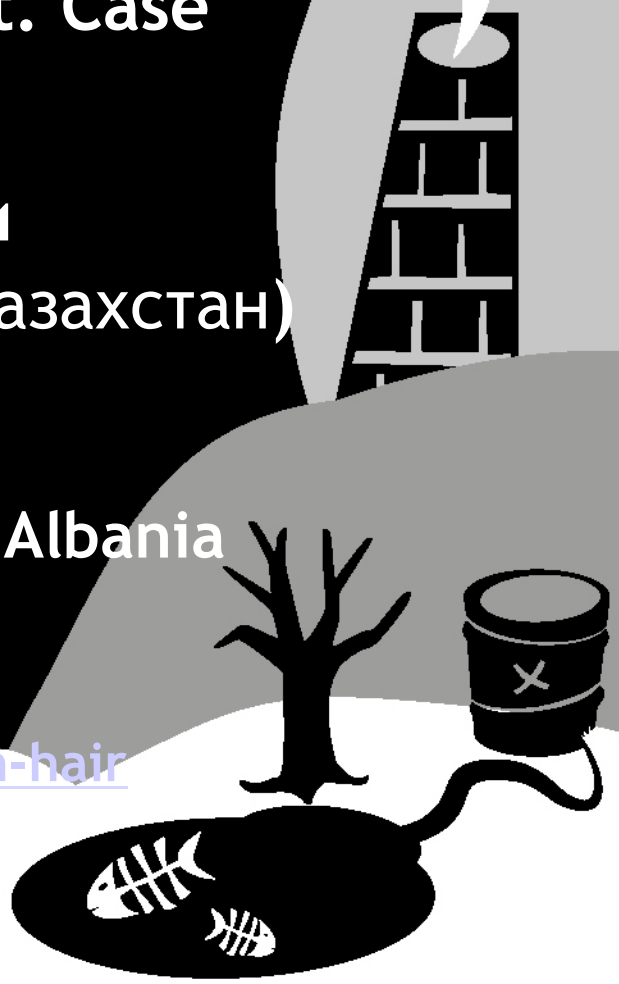
**(Горячие точки загрязнения токсичными веществами.** Центральный и восточный Казахстан)

http://english.arnika.org/kazakhstan/publications

**Contaminated site: Vlora Mercury Hot Spot in Albania**

**IPEN Mercury Free Campaign Report (2013)**

http://www.ipen.org/projects/mercury-fish-and-human-hair



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# Nura river, „Karbid“ Temirtau (Kazakhstan)

N OF HUMAN HEALTH RISKS ASSOCIATED WITH MERCURY IN SELECTED SAMPLES – HAZARD QUOTIENTS (HQ).

| Concentration in soil (mg kg$^{-1}$) | Exposition pathway | | | |
|---|---|---|---|---|
| | Ingestion of soil | Dermal contact of soil | Ingestion of vegetable | |
| 11.8 | 8.4E-02 | 1.7E-02 | 3.5E+00 | 3.6E+00 |
| 10.1 | 7.2E-02 | 1.4E-02 | 3.0E+00 | 3.1E+00 |
| 17.0 | 1.2E-01 | 2.4E-02 | 5.1E+00 | 5.2E+00 |
| 178 | 1.3E+00 | 2.5E-01 | 5.3E+01 | 5.5E+01 |
| 10.8 | 7.7E-02 | 1.5E-02 | 3.2E+00 | 3.3E+00 |

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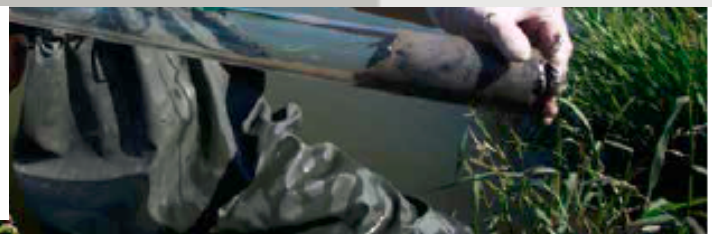
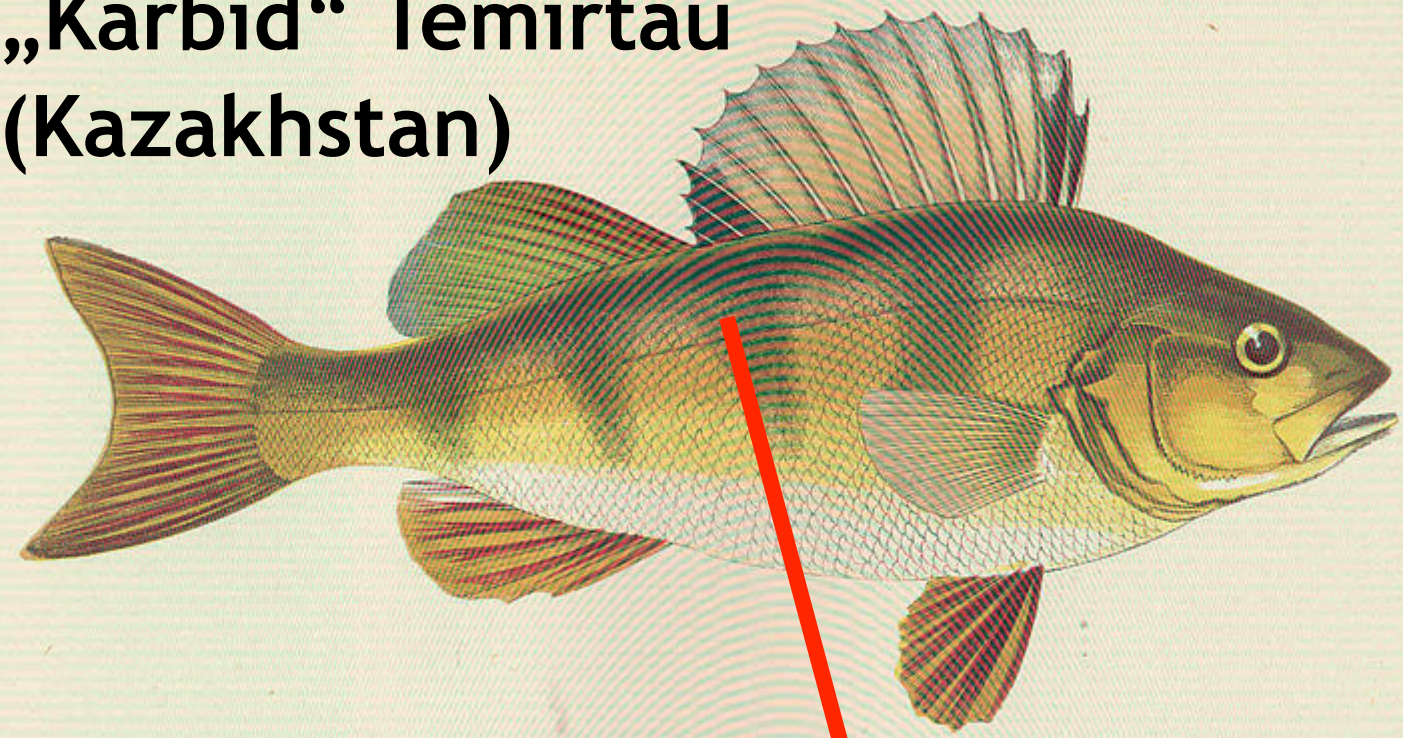


# Nura river, „Karbid“ Temirtau (Kazakhstan)



MERCURY IN
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Standard deviation (SD) of the measurement is 12 %.

| Sample Code | Mercury (mg kg$^{-1}$) | Methylmercury (mg kg$^{-1}$) |
|---|---|---|
| NUR-F-14/1/1 | 0.44 | 0.343 |
| NUR-F-14/1/2-3 | 1.38 | 1.36 |
| NUR-F-14/2 | 0.634 | 0.543 |

# Martredwitz (Germany) and Skalka reservoir (Czech Rep.)

Selb
Skalná
Františkovy Lázně
Skalka reservoir
Skalka
Cheb
Waldsassen
Neualbe
Mitterteich
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Google earth
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km 20

**Established in 1788; 1907 – 1985 – herbicide production based on mercury**

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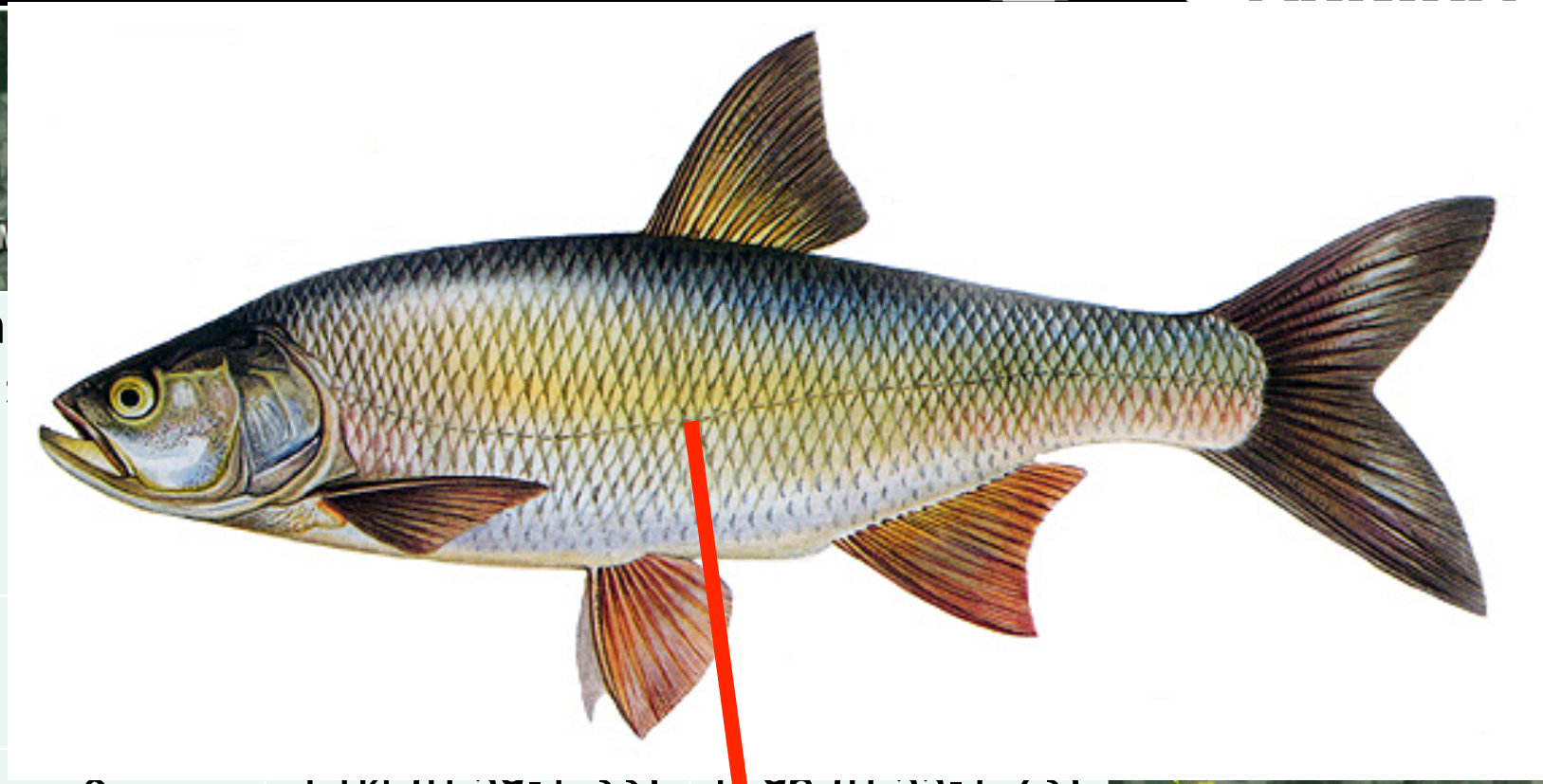
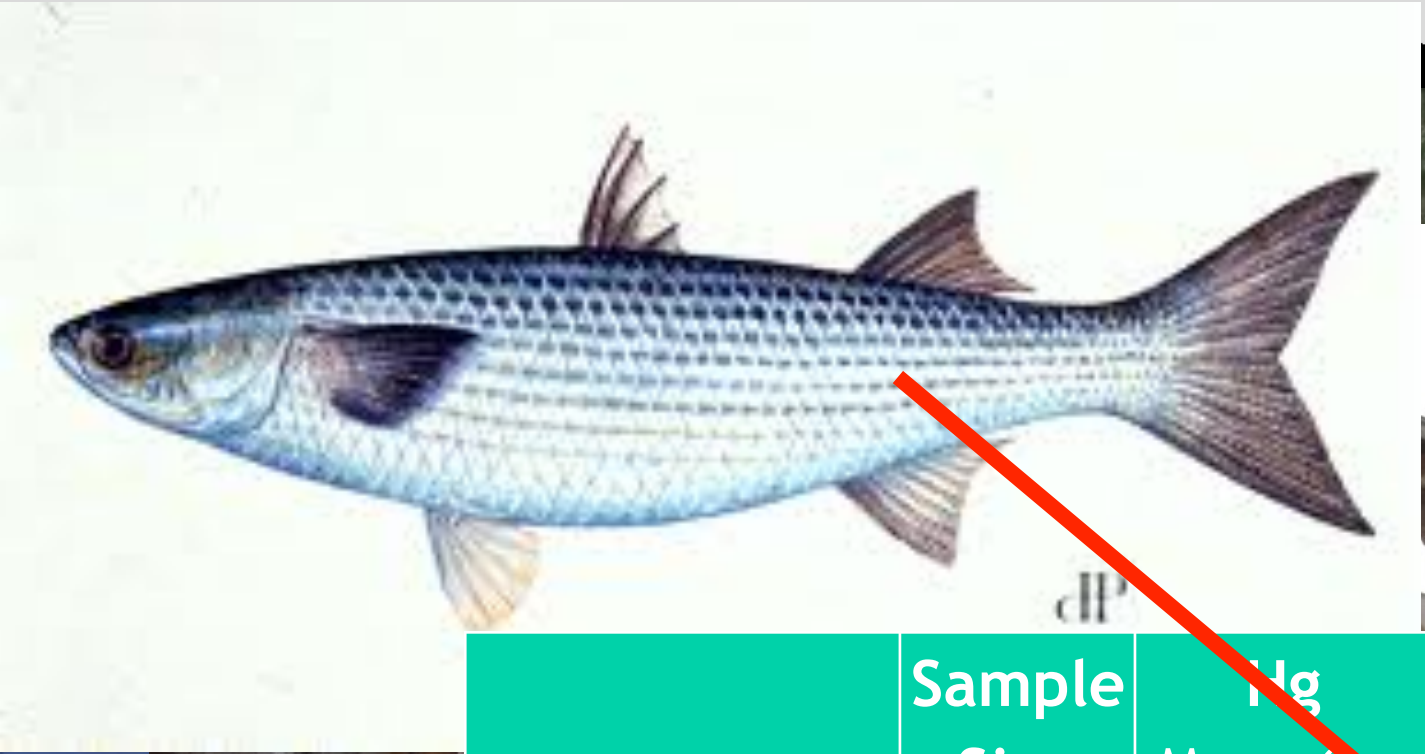
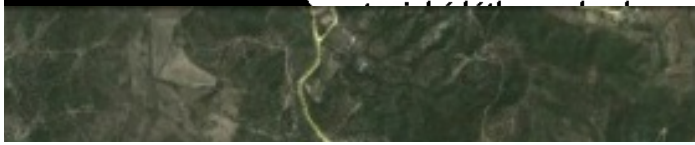
# Martredwitz (Germany) and Skalka reservoir (Czech Rep.)

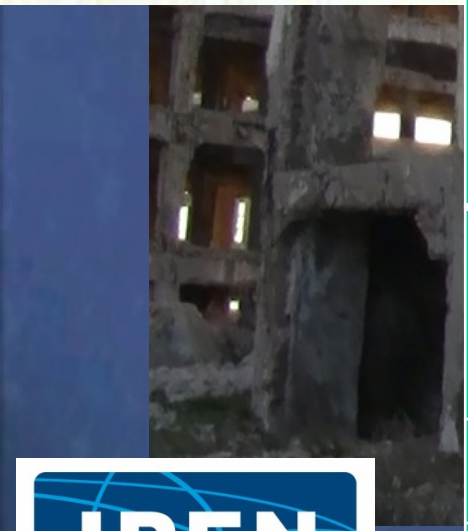


| species | n | | |
|---|---|---|---|
| Big head carp | | | |
| Bream | 8 | 1.04 (0.59-1.33) | 0.96 (0.55-1.23) |
| Roach | 5 | 0.87 (0.65-1.37) | 0.81 (0.58-1.27) |
| Silver bream | 2 | 0.95 (0.91-0.99) | 0.86 (0.81-0.91) |
| Asp | 4 | 3.41 (3.00-4.05) | 3.11 (2.93-3.40) |
| Eel | 3 | 1.85 (1.66-2.11) | 1.80 (1.52-2.26) |
| Wels | 1 | 1.11 | 0.96 |

# Vlora (Albania)







| | Sample Size | Hg Mean(ppm, ww) | St Dev | Min Hg (ppm) | Max Hg (ppm) |
|---|---|---|---|---|---|
| All fish samples | 14 | 0.285 | 0.227 | 0.112 | 0.961 |
| Cod fish | 11 | 0.195 | 0.076 | 0.112 | 0.343 |
| Mullet fish | 3 | 0.617 | 0.309 | 0.365 | 0.961 |

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# Contaminated Sites in CEE Region

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## Remediation of Contaminated Sites is Crucial!

„ Contaminated sediments at the bottom of surface waters can serve as an important mercury reservoir, with sediment-bound mercury recycling back into the aquatic ecosystem for decades or longer.“ (UNEP 2002). Contaminated sites also contribute to re-mobilization and re-emissions of mercury, a significant source and pathway of mercury air emissions (Pirrone, Cinnirella et al. 2010); ( UNEP Chemicals Branch 2008).

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# Contaminated Sites in CEE Region

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## Combined pollution sources

Sources of mercury releases are combined at many sites – ongoing chlorine or VCM production as well as contaminated soil/sediments/site by mercury from historic production using mercury

## Major fish contamination

by mercury can be several tenths km far downstream from the plant (e.g. Karbid facility 60 – 70 km far from Intumak dam (Kazakhstan); Marktredwitz, Germany 20 km from Skalka dam, Czech Republic)

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# Děkuji - Thank you
# Спасибо - Arigato

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