

EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 3, Czech Hydrometeorological Institute, Praha (Czech Republic)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	1.012	0.9	0.873	0.157	0.888	S
H2		0.817	0.7	0.712	0.057	1.835	S
H3		9.225	8	7.968	0.706	1.779	Q
H4		11.765	10.5	10.572	1.021	1.168	S
H1	Cd µg/l	0.091	0.09	0.087	0.011	0.362	S
H2		0.102	0.1	0.096	0.008	0.856	S
H3		1.633	1.5	1.486	0.09	1.646	S
H4		1.44	1.3	1.279	0.081	1.985	S
H1	Cr µg/l	0.997	1.1	1.042	0.109	-0.409	S
H2		0.64	0.7	0.671	0.056	-0.544	S
H3		6.654	7	6.799	0.349	-0.416	S
H4		7.553	8	7.819	0.365	-0.726	S
H1	Cu µg/l	1.222	1.3	1.278	0.113	-0.497	S
H2		0.956	1	0.987	0.088	-0.354	S
H3		8.673	9	8.657	0.395	0.041	S
H4		7.81	8	7.764	0.3	0.154	S
H1	Ni µg/l	1.203	1.2	1.141	0.117	0.532	S
H2		0.895	0.9	0.872	0.089	0.261	S
H3		10.34	10	9.795	0.657	0.829	S
H4		11.22	11	10.726	0.588	0.841	S
H1	Pb µg/l	0.75	0.8	0.756	0.06	-0.099	S
H2		1.018	1.1	1.034	0.083	-0.195	S
H3		24.295	25.5	24.811	1.314	-0.393	S
H4		25.52	27	26.083	1.52	-0.37	S
H1	Zn µg/l	14.1	12	12.065	1.301	1.564	Q
H2		10.69	9	9.088	1.789	0.895	S
H3		138.25	115	114.681	8.25	2.857	Q
H4		143.8	122	120.844	8.84	2.597	Q

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PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

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If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

☒ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 4, Aarhus University, Department of Environmental Science (Denmark)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As $\mu\text{g/l}$	0.876	0.9	0.873	0.157	0.021	S
H2		0.686	0.7	0.712	0.057	-0.46	S
H3		7.712	8	7.968	0.706	-0.363	S
H4		10.011	10.5	10.572	1.021	-0.55	S
H1	Cd $\mu\text{g/l}$	0.079	0.09	0.087	0.011	-0.76	S
H2		0.089	0.1	0.096	0.008	-0.927	S
H3		1.377	1.5	1.486	0.09	-1.211	S
H4		1.181	1.3	1.279	0.081	-1.221	S
H1	Cr $\mu\text{g/l}$	1.186	1.1	1.042	0.109	1.321	S
H2		0.776	0.7	0.671	0.056	1.856	S
H3		7.617	7	6.799	0.349	2.341	S
H4		8.578	8	7.819	0.365	2.078	S
H1	Cu $\mu\text{g/l}$	1.513	1.3	1.278	0.113	2.076	S
H2		1.184	1	0.987	0.088	2.223	S
H3		10.408	9	8.657	0.395	4.431	Q
H4		9.232	8	7.764	0.3	4.898	Q
H1	Ni $\mu\text{g/l}$	1.212	1.2	1.141	0.117	0.609	S
H2		0.939	0.9	0.872	0.089	0.752	S
H3		9.863	10	9.795	0.657	0.103	S
H4		10.867	11	10.726	0.588	0.241	S
H1	Pb $\mu\text{g/l}$	0.737	0.8	0.756	0.06	-0.315	S
H2		1.012	1.1	1.034	0.083	-0.262	S
H3		23.282	25.5	24.811	1.314	-1.164	S
H4		24.652	27	26.083	1.52	-0.941	S
H1	Zn $\mu\text{g/l}$	-999	12	12.065	1.301		B
H2		-999	9	9.088	1.789		B
H3		-999	115	114.681	8.25		B
H4		-999	122	120.844	8.84		B

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PO Box 100
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NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 5, Finnish Meteorological Institute. Air Quality Department (Finland)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.831	0.9	0.873	0.157	-0.264	S
H2		0.651	0.7	0.712	0.057	-1.076	S
H3		7.422	8	7.968	0.706	-0.774	S
H4		9.727	10.5	10.572	1.021	-0.828	S
H1	Cd µg/l	0.085	0.09	0.087	0.011	-0.199	S
H2		0.098	0.1	0.096	0.008	0.261	S
H3		1.479	1.5	1.486	0.09	-0.073	S
H4		1.282	1.3	1.279	0.081	0.031	S
H1	Cr µg/l	1.036	1.1	1.042	0.109	-0.052	S
H2		0.671	0.7	0.671	0.056	-0.004	S
H3		6.794	7	6.799	0.349	-0.015	S
H4		7.726	8	7.819	0.365	-0.254	S
H1	Cu µg/l	1.237	1.3	1.278	0.113	-0.36	S
H2		0.98	1	0.987	0.088	-0.083	S
H3		8.715	9	8.657	0.395	0.147	S
H4		7.762	8	7.764	0.3	-0.006	S
H1	Ni µg/l	1.135	1.2	1.141	0.117	-0.05	S
H2		0.853	0.9	0.872	0.089	-0.219	S
H3		9.618	10	9.795	0.657	-0.27	S
H4		10.584	11	10.726	0.588	-0.241	S
H1	Pb µg/l	0.799	0.8	0.756	0.06	0.712	S
H2		1.108	1.1	1.034	0.083	0.892	S
H3		25.657	25.5	24.811	1.314	0.644	S
H4		27.04	27	26.083	1.52	0.63	S
H1	Zn µg/l	11.497	12	12.065	1.301	-0.436	S
H2		37.942	9	9.088	1.789	16.13	U
H3		112.067	115	114.681	8.25	-0.317	S
H4		118.647	122	120.844	8.84	-0.249	S

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NO-9296 TROMSØ, Norway
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Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 7, synlab Umweltinstitut GmbH, Niederlassung Leipzig (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As $\mu\text{g/l}$	0.91	0.9	0.873	0.157	0.237	S
H2		0.71	0.7	0.712	0.057	-0.038	S
H3		8.07	8	7.968	0.706	0.144	S
H4		10.63	10.5	10.572	1.021	0.057	S
H1	Cd $\mu\text{g/l}$	0.083	0.09	0.087	0.011	-0.386	S
H2		0.095	0.1	0.096	0.008	-0.135	S
H3		1.57	1.5	1.486	0.09	0.943	S
H4		1.34	1.3	1.279	0.081	0.751	S
H1	Cr $\mu\text{g/l}$	1.023	1.1	1.042	0.109	-0.171	S
H2		0.66	0.7	0.671	0.056	-0.199	S
H3		6.46	7	6.799	0.349	-0.971	S
H4		7.5	8	7.819	0.365	-0.873	S
H1	Cu $\mu\text{g/l}$	1.2	1.3	1.278	0.113	-0.687	S
H2		1.013	1	0.987	0.088	0.29	S
H3		8.6	9	8.657	0.395	-0.144	S
H4		7.74	8	7.764	0.3	-0.08	S
H1	Ni $\mu\text{g/l}$	1.045	1.2	1.141	0.117	-0.821	S
H2		0.83	0.9	0.872	0.089	-0.479	S
H3		9.34	10	9.795	0.657	-0.693	S
H4		10.32	11	10.726	0.588	-0.69	S
H1	Pb $\mu\text{g/l}$	0.71	0.8	0.756	0.06	-0.761	S
H2		0.99	1.1	1.034	0.083	-0.526	S
H3		26.37	25.5	24.811	1.314	1.186	S
H4		28.14	27	26.083	1.52	1.353	S
H1	Zn $\mu\text{g/l}$	14.21	12	12.065	1.301	1.649	Q
H2		10.46	9	9.088	1.789	0.767	S
H3		122	115	114.681	8.25	0.887	S
H4		128	122	120.844	8.84	0.81	S

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Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 8, Umweltbundesamt, Langen (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As $\mu\text{g/l}$	0.865	0.9	0.873	0.157	-0.051	S
H2		0.677	0.7	0.712	0.057	-0.617	S
H3		7.635	8	7.968	0.706	-0.472	S
H4		10.02	10.5	10.572	1.021	-0.541	S
H1	Cd $\mu\text{g/l}$	0.088	0.09	0.087	0.011	0.044	S
H2		0.095	0.1	0.096	0.008	-0.135	S
H3		1.454	1.5	1.486	0.09	-0.352	S
H4		1.255	1.3	1.279	0.081	-0.304	S
H1	Cr $\mu\text{g/l}$	1.039	1.1	1.042	0.109	-0.024	S
H2		0.665	0.7	0.671	0.056	-0.11	S
H3		6.784	7	6.799	0.349	-0.043	S
H4		7.735	8	7.819	0.365	-0.229	S
H1	Cu $\mu\text{g/l}$	1.29	1.3	1.278	0.113	0.108	S
H2		0.993	1	0.987	0.088	0.064	S
H3		8.97	9	8.657	0.395	0.792	S
H4		8	8	7.764	0.3	0.788	S
H1	Ni $\mu\text{g/l}$	1.166	1.2	1.141	0.117	0.215	S
H2		0.865	0.9	0.872	0.089	-0.084	S
H3		9.75	10	9.795	0.657	-0.069	S
H4		10.64	11	10.726	0.588	-0.146	S
H1	Pb $\mu\text{g/l}$	0.767	0.8	0.756	0.06	0.182	S
H2		1.065	1.1	1.034	0.083	0.376	S
H3		24.73	25.5	24.811	1.314	-0.062	S
H4		26.03	27	26.083	1.52	-0.035	S
H1	Zn $\mu\text{g/l}$	12.02	12	12.065	1.301	-0.034	S
H2		9.51	9	9.088	1.789	0.236	S
H3		115.8	115	114.681	8.25	0.136	S
H4		122.8	122	120.844	8.84	0.221	S

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NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
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* Z score in unitless

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U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 10, Institute for Atmospheric Physics (Hungary)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As <i>µg/l</i>	-999	0.9	0.873	0.157		B
H2		-999	0.7	0.712	0.057		B
H3		-999	8	7.968	0.706		B
H4		-999	10.5	10.572	1.021		B
H1	Cd <i>µg/l</i>	-999	0.09	0.087	0.011		B
H2		-999	0.1	0.096	0.008		B
H3		-999	1.5	1.486	0.09		B
H4		-999	1.3	1.279	0.081		B
H1	Cr <i>µg/l</i>	-999	1.1	1.042	0.109		B
H2		-999	0.7	0.671	0.056		B
H3		-999	7	6.799	0.349		B
H4		-999	8	7.819	0.365		B
H1	Cu <i>µg/l</i>	-999	1.3	1.278	0.113		B
H2		-999	1	0.987	0.088		B
H3		-999	9	8.657	0.395		B
H4		-999	8	7.764	0.3		B
H1	Ni <i>µg/l</i>	-999	1.2	1.141	0.117		B
H2		-999	0.9	0.872	0.089		B
H3		-999	10	9.795	0.657		B
H4		-999	11	10.726	0.588		B
H1	Pb <i>µg/l</i>	0.693	0.8	0.756	0.06	-1.043	S
H2		1.163	1.1	1.034	0.083	1.553	S
H3		28.789	25.5	24.811	1.314	3.027	S
H4		29.832	27	26.083	1.52	2.466	S
H1	Zn <i>µg/l</i>	-999	12	12.065	1.301		B
H2		-999	9	9.088	1.789		B
H3		-999	115	114.681	8.25		B
H4		-999	122	120.844	8.84		B

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Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 15, Norwegian Institute for Air Research NILU (Norway)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As <i>µg/l</i>	0.9	0.9	0.873	0.157	0.174	S
H2		0.7	0.7	0.712	0.057	-0.214	S
H3		7.4	8	7.968	0.706	-0.805	S
H4		9.6	10.5	10.572	1.021	-0.952	S
H1	Cd <i>µg/l</i>	0.09	0.09	0.087	0.011	0.269	S
H2		0.1	0.1	0.096	0.008	0.525	S
H3		1.5	1.5	1.486	0.09	0.162	S
H4		1.3	1.3	1.279	0.081	0.255	S
H1	Cr <i>µg/l</i>	1	1.1	1.042	0.109	-0.382	S
H2		0.66	0.7	0.671	0.056	-0.199	S
H3		6.8	7	6.799	0.349	0.002	S
H4		7.8	8	7.819	0.365	-0.051	S
H1	Cu <i>µg/l</i>	1.3	1.3	1.278	0.113	0.196	S
H2		1	1	0.987	0.088	0.143	S
H3		8.7	9	8.657	0.395	0.109	S
H4		7.8	8	7.764	0.3	0.12	S
H1	Ni <i>µg/l</i>	1.1	1.2	1.141	0.117	-0.35	S
H2		0.8	0.9	0.872	0.089	-0.817	S
H3		9.6	10	9.795	0.657	-0.297	S
H4		10.5	11	10.726	0.588	-0.384	S
H1	Pb <i>µg/l</i>	0.75	0.8	0.756	0.06	-0.099	S
H2		1	1.1	1.034	0.083	-0.406	S
H3		25	25.5	24.811	1.314	0.144	S
H4		27	27	26.083	1.52	0.604	S
H1	Zn <i>µg/l</i>	11	12	12.065	1.301	-0.819	S
H2		8.5	9	9.088	1.789	-0.329	S
H3		105	115	114.681	8.25	-1.174	S
H4		116	122	120.844	8.84	-0.548	S

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Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 16, Institute of Meteorology and Water Management, Warsaw (Poland)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	-999	0.9	0.873	0.157		B
H2		-999	0.7	0.712	0.057		B
H3		-999	8	7.968	0.706		B
H4		-999	10.5	10.572	1.021		B
H1	Cd µg/l	0.085	0.09	0.087	0.011	-0.199	S
H2		0.095	0.1	0.096	0.008	-0.135	S
H3		1.5	1.5	1.486	0.09	0.162	S
H4		1.3	1.3	1.279	0.081	0.255	S
H1	Cr µg/l	1.05	1.1	1.042	0.109	0.076	S
H2		0.65	0.7	0.671	0.056	-0.376	S
H3		6.8	7	6.799	0.349	0.002	S
H4		7.8	8	7.819	0.365	-0.051	S
H1	Cu µg/l	1.3	1.3	1.278	0.113	0.196	S
H2		1	1	0.987	0.088	0.143	S
H3		8.6	9	8.657	0.395	-0.144	S
H4		7.8	8	7.764	0.3	0.12	S
H1	Ni µg/l	1.1	1.2	1.141	0.117	-0.35	S
H2		0.8	0.9	0.872	0.089	-0.817	S
H3		9.7	10	9.795	0.657	-0.145	S
H4		10.8	11	10.726	0.588	0.127	S
H1	Pb µg/l	0.8	0.8	0.756	0.06	0.728	S
H2		1	1.1	1.034	0.083	-0.406	S
H3		24.5	25.5	24.811	1.314	-0.237	S
H4		26	27	26.083	1.52	-0.054	S
H1	Zn µg/l	11.5	12	12.065	1.301	-0.434	S
H2		8.5	9	9.088	1.789	-0.329	S
H3		110	115	114.681	8.25	-0.567	S
H4		115	122	120.844	8.84	-0.661	S

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B – Blank: You reported either no value or the detection limit

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 20, Swedish Environmental Research Institute IVL, Gothenburg (Sweden)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.95	0.9	0.873	0.157	0.491	S
H2		0.72	0.7	0.712	0.057	0.138	S
H3		8.2	8	7.968	0.706	0.328	S
H4		10.65	10.5	10.572	1.021	0.076	S
H1	Cd µg/l	0.094	0.09	0.087	0.011	0.643	S
H2		0.107	0.1	0.096	0.008	1.45	S
H3		1.575	1.5	1.486	0.09	0.999	S
H4		1.349	1.3	1.279	0.081	0.862	S
H1	Cr µg/l	1.02	1.1	1.042	0.109	-0.198	S
H2		0.64	0.7	0.671	0.056	-0.553	S
H3		6.54	7	6.799	0.349	-0.742	S
H4		7.422	8	7.819	0.365	-1.086	S
H1	Cu µg/l	1.25	1.3	1.278	0.113	-0.245	S
H2		0.94	1	0.987	0.088	-0.535	S
H3		8.56	9	8.657	0.395	-0.245	S
H4		7.498	8	7.764	0.3	-0.887	S
H1	Ni µg/l	1.107	1.2	1.141	0.117	-0.29	S
H2		0.812	0.9	0.872	0.089	-0.682	S
H3		9.472	10	9.795	0.657	-0.492	S
H4		10.23	11	10.726	0.588	-0.843	S
H1	Pb µg/l	0.76	0.8	0.756	0.06	0.066	S
H2		1.04	1.1	1.034	0.083	0.075	S
H3		24.52	25.5	24.811	1.314	-0.222	S
H4		25.55	27	26.083	1.52	-0.35	S
H1	Zn µg/l	13.2	12	12.065	1.301	0.873	S
H2		9.8	9	9.088	1.789	0.398	S
H3		121.5	115	114.681	8.25	0.827	S
H4		126.9	122	120.844	8.84	0.685	S

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 22, Institute of Global Climate and Ecology (Russian Federation)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As <i>µg/l</i>	-999	0.9	0.873	0.157		B
H2		-999	0.7	0.712	0.057		B
H3		-999	8	7.968	0.706		B
H4		-999	10.5	10.572	1.021		B
H1	Cd <i>µg/l</i>	0.095	0.09	0.087	0.011	0.736	S
H2		0.1	0.1	0.096	0.008	0.525	S
H3		1.5	1.5	1.486	0.09	0.162	S
H4		1.2	1.3	1.279	0.081	-0.986	S
H1	Cr <i>µg/l</i>	-999	1.1	1.042	0.109		B
H2		-999	0.7	0.671	0.056		B
H3		-999	7	6.799	0.349		B
H4		-999	8	7.819	0.365		B
H1	Cu <i>µg/l</i>	-999	1.3	1.278	0.113		B
H2		-999	1	0.987	0.088		B
H3		-999	9	8.657	0.395		B
H4		-999	8	7.764	0.3		B
H1	Ni <i>µg/l</i>	-999	1.2	1.141	0.117		B
H2		-999	0.9	0.872	0.089		B
H3		-999	10	9.795	0.657		B
H4		-999	11	10.726	0.588		B
H1	Pb <i>µg/l</i>	1	0.8	0.756	0.06	4.039	S
H2		0.97	1.1	1.034	0.083	-0.766	S
H3		23.1	25.5	24.811	1.314	-1.302	S
H4		24.3	27	26.083	1.52	-1.173	S
H1	Zn <i>µg/l</i>	-999	12	12.065	1.301		B
H2		-999	9	9.088	1.789		B
H3		-999	115	114.681	8.25		B
H4		-999	122	120.844	8.84		B

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Framsenteret / The Fram Centre
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Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 31, Slovak Hydrometeorological Institute (Slovakia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.96	0.9	0.873	0.157	0.555	S
H2		0.675	0.7	0.712	0.057	-0.654	S
H3		8.249	8	7.968	0.706	0.398	S
H4		11.143	10.5	10.572	1.021	0.559	S
H1	Cd µg/l	0.087	0.09	0.087	0.011	-0.012	S
H2		0.095	0.1	0.096	0.008	-0.135	S
H3		1.436	1.5	1.486	0.09	-0.553	S
H4		1.283	1.3	1.279	0.081	0.044	S
H1	Cr µg/l	1.041	1.1	1.042	0.109	-0.006	S
H2		0.599	0.7	0.671	0.056	-1.279	S
H3		6.853	7	6.799	0.349	0.154	S
H4		8.077	8	7.819	0.365	0.707	S
H1	Cu µg/l	1.282	1.3	1.278	0.113	0.037	S
H2		0.957	1	0.987	0.088	-0.343	S
H3		8.713	9	8.657	0.395	0.142	S
H4		8.091	8	7.764	0.3	1.091	S
H1	Ni µg/l	1.203	1.2	1.141	0.117	0.532	S
H2		0.873	0.9	0.872	0.089	0.007	S
H3		9.789	10	9.795	0.657	-0.01	S
H4		11.06	11	10.726	0.588	0.569	S
H1	Pb µg/l	0.787	0.8	0.756	0.06	0.513	S
H2		1.059	1.1	1.034	0.083	0.303	S
H3		23.942	25.5	24.811	1.314	-0.661	S
H4		26	27	26.083	1.52	-0.054	S
H1	Zn µg/l	11.487	12	12.065	1.301	-0.444	S
H2		9.306	9	9.088	1.789	0.122	S
H3		111.34	115	114.681	8.25	-0.405	S
H4		121.584	122	120.844	8.84	0.084	S

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Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 32, Atmospheric Pollution Research Laboratory, Institute of Physics, Vilnius (Lithuania)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As $\mu\text{g/l}$	0.074	0.9	0.873	0.157	-5.071	U
H2		0.071	0.7	0.712	0.057	-11.278	U
H3		0.92	8	7.968	0.706	-9.982	U
H4		1.16	10.5	10.572	1.021	-9.219	U
H1	Cd $\mu\text{g/l}$	0.09	0.09	0.087	0.011	0.269	S
H2		0.11	0.1	0.096	0.008	1.846	S
H3		1.31	1.5	1.486	0.09	-1.959	S
H4		1.17	1.3	1.279	0.081	-1.358	S
H1	Cr $\mu\text{g/l}$	0.93	1.1	1.042	0.109	-1.022	Q
H2		0.65	0.7	0.671	0.056	-0.376	S
H3		6.31	7	6.799	0.349	-1.4	S
H4		7.01	8	7.819	0.365	-2.214	S
H1	Cu $\mu\text{g/l}$	1.18	1.3	1.278	0.113	-0.863	S
H2		1.02	1	0.987	0.088	0.369	S
H3		8.33	9	8.657	0.395	-0.827	S
H4		7.42	8	7.764	0.3	-1.147	S
H1	Ni $\mu\text{g/l}$	1.06	1.2	1.141	0.117	-0.692	S
H2		1.02	0.9	0.872	0.089	1.666	S
H3		8.85	10	9.795	0.657	-1.438	S
H4		9.62	11	10.726	0.588	-1.88	S
H1	Pb $\mu\text{g/l}$	0.72	0.8	0.756	0.06	-0.596	S
H2		1.5	1.1	1.034	0.083	5.604	U
H3		22.9	25.5	24.811	1.314	-1.454	S
H4		23.81	27	26.083	1.52	-1.495	S
H1	Zn $\mu\text{g/l}$	1.21	12	12.065	1.301	-8.344	U
H2		0.97	9	9.088	1.789	-4.538	U
H3		11.61	115	114.681	8.25	-12.494	U
H4		11.57	122	120.844	8.84	-12.362	U

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NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 33, Environmental Pollution Observ. Centre (Latvia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.8	0.9	0.873	0.157	-0.461	S
H2		0.7	0.7	0.712	0.057	-0.214	S
H3		8.5	8	7.968	0.706	0.753	S
H4		10.5	10.5	10.572	1.021	-0.071	S
H1	Cd µg/l	0.1	0.09	0.087	0.011	1.204	S
H2		0.1	0.1	0.096	0.008	0.525	S
H3		1.5	1.5	1.486	0.09	0.162	S
H4		1.3	1.3	1.279	0.081	0.255	S
H1	Cr µg/l	1.04	1.1	1.042	0.109	-0.015	S
H2		0.65	0.7	0.671	0.056	-0.376	S
H3		6.7	7	6.799	0.349	-0.284	S
H4		7.7	8	7.819	0.365	-0.325	S
H1	Cu µg/l	1.3	1.3	1.278	0.113	0.196	S
H2		0.95	1	0.987	0.088	-0.422	S
H3		8.8	9	8.657	0.395	0.362	S
H4		8	8	7.764	0.3	0.788	S
H1	Ni µg/l	1.3	1.2	1.141	0.117	1.362	S
H2		1.12	0.9	0.872	0.089	2.796	S
H3		10.2	10	9.795	0.657	0.616	S
H4		10.8	11	10.726	0.588	0.127	S
H1	Pb µg/l	0.8	0.8	0.756	0.06	0.728	S
H2		1.1	1.1	1.034	0.083	0.796	S
H3		26	25.5	24.811	1.314	0.905	S
H4		27	27	26.083	1.52	0.604	S
H1	Zn µg/l	11	12	12.065	1.301	-0.819	S
H2		9.1	9	9.088	1.789	0.007	S
H3		106	115	114.681	8.25	-1.052	S
H4		110.5	122	120.844	8.84	-1.17	S

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 34, Ministry of Environment and Urbanisation (Turkey)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.077	0.9	0.873	0.157	-5.049	U
H2		0.644	0.7	0.712	0.057	-1.199	S
H3		7.144	8	7.968	0.706	-1.167	S
H4		9.405	10.5	10.572	1.021	-1.143	S
H1	Cd µg/l	0.009	0.09	0.087	0.011	-7.354	U
H2		0.094	0.1	0.096	0.008	-0.267	S
H3		1.366	1.5	1.486	0.09	-1.334	S
H4		1.112	1.3	1.279	0.081	-2.077	S
H1	Cr µg/l	1.018	1.1	1.042	0.109	-0.217	S
H2		0.679	0.7	0.671	0.056	0.138	S
H3		6.354	7	6.799	0.349	-1.274	S
H4		7.208	8	7.819	0.365	-1.672	S
H1	Cu µg/l	1.099	1.3	1.278	0.113	-1.578	S
H2		0.777	1	0.987	0.088	-2.377	S
H3		7.633	9	8.657	0.395	-2.59	Q
H4		6.743	8	7.764	0.3	-3.406	Q
H1	Ni µg/l	1.109	1.2	1.141	0.117	-0.273	S
H2		0.854	0.9	0.872	0.089	-0.208	S
H3		8.841	10	9.795	0.657	-1.452	S
H4		9.667	11	10.726	0.588	-1.8	S
H1	Pb µg/l	0.69	0.8	0.756	0.06	-1.092	S
H2		0.957	1.1	1.034	0.083	-0.923	S
H3		23.537	25.5	24.811	1.314	-0.97	S
H4		23.823	27	26.083	1.52	-1.486	S
H1	Zn µg/l	10.166	12	12.065	1.301	-1.46	Q
H2		7.716	9	9.088	1.789	-0.767	S
H3		93.74	115	114.681	8.25	-2.538	Q
H4		98.324	122	120.844	8.84	-2.548	Q

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Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 36, Hydrometeorological Institute of Slovenia (Slovenia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As $\mu\text{g/l}$	0.871	0.9	0.873	0.157	-0.01	S
H2		0.673	0.7	0.712	0.057	-0.689	S
H3		7.64	8	7.968	0.706	-0.465	S
H4		10.2	10.5	10.572	1.021	-0.365	S
H1	Cd $\mu\text{g/l}$	0.085	0.09	0.087	0.011	-0.199	S
H2		0.094	0.1	0.096	0.008	-0.267	S
H3		1.45	1.5	1.486	0.09	-0.396	S
H4		1.27	1.3	1.279	0.081	-0.118	S
H1	Cr $\mu\text{g/l}$	1.04	1.1	1.042	0.109	-0.015	S
H2		< 0.800	0.7	0.671	0.056		B
H3		6.76	7	6.799	0.349	-0.112	S
H4		7.85	8	7.819	0.365	0.085	S
H1	Cu $\mu\text{g/l}$	1.26	1.3	1.278	0.113	-0.157	S
H2		< 1.000	1	0.987	0.088	-5.509	Q
H3		8.74	9	8.657	0.395	0.21	S
H4		7.85	8	7.764	0.3	0.287	S
H1	Ni $\mu\text{g/l}$	1.14	1.2	1.141	0.117	-0.008	S
H2		0.862	0.9	0.872	0.089	-0.117	S
H3		9.77	10	9.795	0.657	-0.038	S
H4		10.9	11	10.726	0.588	0.297	S
H1	Pb $\mu\text{g/l}$	0.758	0.8	0.756	0.06	0.033	S
H2		1.04	1.1	1.034	0.083	0.075	S
H3		24.3	25.5	24.811	1.314	-0.389	S
H4		26.1	27	26.083	1.52	0.011	S
H1	Zn $\mu\text{g/l}$	11.2	12	12.065	1.301	-0.665	S
H2		8.38	9	9.088	1.789	-0.396	S
H3		108	115	114.681	8.25	-0.81	S
H4		115	122	120.844	8.84	-0.661	S

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NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
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* Z score in unitless

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 38, Estonian Environmental Research Centre, Tallinn (Estonia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.87	0.9	0.873	0.157	-0.017	S
H2		0.65	0.7	0.712	0.057	-1.094	S
H3		7.18	8	7.968	0.706	-1.116	S
H4		9.25	10.5	10.572	1.021	-1.295	S
H1	Cd µg/l	0.08	0.09	0.087	0.011	-0.666	S
H2		0.09	0.1	0.096	0.008	-0.795	S
H3		1.36	1.5	1.486	0.09	-1.401	S
H4		1.18	1.3	1.279	0.081	-1.234	S
H1	Cr µg/l	0.86	1.1	1.042	0.109	-1.663	Q
H2		0.6	0.7	0.671	0.056	-1.262	S
H3		6.14	7	6.799	0.349	-1.887	S
H4		6.96	8	7.819	0.365	-2.351	S
H1	Cu µg/l	1.14	1.3	1.278	0.113	-1.216	S
H2		< 1.000	1	0.987	0.088	-5.509	Q
H3		8.07	9	8.657	0.395	-1.485	S
H4		7.19	8	7.764	0.3	-1.915	S
H1	Ni µg/l	1.04	1.2	1.141	0.117	-0.864	S
H2		0.79	0.9	0.872	0.089	-0.93	S
H3		8.96	10	9.795	0.657	-1.271	S
H4		9.7	11	10.726	0.588	-1.744	S
H1	Pb µg/l	0.69	0.8	0.756	0.06	-1.092	S
H2		0.95	1.1	1.034	0.083	-1.007	S
H3		24	25.5	24.811	1.314	-0.617	S
H4		24.6	27	26.083	1.52	-0.975	S
H1	Zn µg/l	17.7	12	12.065	1.301	4.332	U
H2		9.31	9	9.088	1.789	0.124	S
H3		111	115	114.681	8.25	-0.446	S
H4		118	122	120.844	8.84	-0.322	S

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Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
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* Z score in unitless

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 39, Environmental Monitoring Laboratory, Institute of Environmental Protection (Poland)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As <i>µg/l</i>	0.9	0.9	0.873	0.157	0.174	S
H2		0.7	0.7	0.712	0.057	-0.214	S
H3		8	8	7.968	0.706	0.045	S
H4		10	10.5	10.572	1.021	-0.56	S
H1	Cd <i>µg/l</i>	-999	0.09	0.087	0.011		B
H2		-999	0.1	0.096	0.008		B
H3		1.4	1.5	1.486	0.09	-0.954	S
H4		1.2	1.3	1.279	0.081	-0.986	S
H1	Cr <i>µg/l</i>	1	1.1	1.042	0.109	-0.382	S
H2		0.7	0.7	0.671	0.056	0.51	S
H3		7	7	6.799	0.349	0.575	S
H4		8	8	7.819	0.365	0.496	S
H1	Cu <i>µg/l</i>	-999	1.3	1.278	0.113		B
H2		-999	1	0.987	0.088		B
H3		9	9	8.657	0.395	0.868	S
H4		8	8	7.764	0.3	0.788	S
H1	Ni <i>µg/l</i>	1.1	1.2	1.141	0.117	-0.35	S
H2		0.8	0.9	0.872	0.089	-0.817	S
H3		9.5	10	9.795	0.657	-0.449	S
H4		11	11	10.726	0.588	0.467	S
H1	Pb <i>µg/l</i>	0.8	0.8	0.756	0.06	0.728	S
H2		1.1	1.1	1.034	0.083	0.796	S
H3		25	25.5	24.811	1.314	0.144	S
H4		27	27	26.083	1.52	0.604	S
H1	Zn <i>µg/l</i>	-999	12	12.065	1.301		B
H2		-999	9	9.088	1.789		B
H3		110	115	114.681	8.25	-0.567	S
H4		120	122	120.844	8.84	-0.096	S

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Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

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* Z score in unitless

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 41, Micro Pollutants Technology (France)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	1	0.9	0.873	0.157	0.809	S
H2		0.756	0.7	0.712	0.057	0.771	S
H3		8.92	8	7.968	0.706	1.348	S
H4		11.72	10.5	10.572	1.021	1.124	S
H1	Cd µg/l	0.101	0.09	0.087	0.011	1.298	S
H2		0.114	0.1	0.096	0.008	2.374	S
H3		1.59	1.5	1.486	0.09	1.166	S
H4		1.36	1.3	1.279	0.081	0.999	S
H1	Cr µg/l	1.14	1.1	1.042	0.109	0.9	S
H2		0.696	0.7	0.671	0.056	0.439	S
H3		7.18	7	6.799	0.349	1.09	S
H4		8.12	8	7.819	0.365	0.825	S
H1	Cu µg/l	1.35	1.3	1.278	0.113	0.637	S
H2		0.995	1	0.987	0.088	0.087	S
H3		8.91	9	8.657	0.395	0.641	S
H4		7.91	8	7.764	0.3	0.487	S
H1	Ni µg/l	1.18	1.2	1.141	0.117	0.335	S
H2		0.894	0.9	0.872	0.089	0.244	S
H3		9.97	10	9.795	0.657	0.266	S
H4		10.84	11	10.726	0.588	0.195	S
H1	Pb µg/l	0.766	0.8	0.756	0.06	0.166	S
H2		1.01	1.1	1.034	0.083	-0.286	S
H3		24.85	25.5	24.811	1.314	0.03	S
H4		25.89	27	26.083	1.52	-0.127	S
H1	Zn µg/l	12.12	12	12.065	1.301	0.042	S
H2		8.68	9	9.088	1.789	-0.228	S
H3		125.5	115	114.681	8.25	1.311	S
H4		132	122	120.844	8.84	1.262	S

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e-mail: nilu@nilu.no
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 48, Afdeling Rapportering Water Labovestiging Gent, VMM (Belgium)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.822	0.9	0.873	0.157	-0.321	S
H2		0.681	0.7	0.712	0.057	-0.548	S
H3		8.046	8	7.968	0.706	0.11	S
H4		10.483	10.5	10.572	1.021	-0.087	S
H1	Cd µg/l	0.082	0.09	0.087	0.011	-0.479	S
H2		0.097	0.1	0.096	0.008	0.129	S
H3		1.441	1.5	1.486	0.09	-0.497	S
H4		1.217	1.3	1.279	0.081	-0.775	S
H1	Cr µg/l	0.908	1.1	1.042	0.109	-1.224	Q
H2		0.606	0.7	0.671	0.056	-1.155	S
H3		6.193	7	6.799	0.349	-1.735	S
H4		7.074	8	7.819	0.365	-2.039	S
H1	Cu µg/l	1.089	1.3	1.278	0.113	-1.666	S
H2		0.886	1	0.987	0.088	-1.145	S
H3		8.059	9	8.657	0.395	-1.513	S
H4		7.06	8	7.764	0.3	-2.349	S
H1	Ni µg/l	0.974	1.2	1.141	0.117	-1.428	Q
H2		0.763	0.9	0.872	0.089	-1.235	S
H3		9.014	10	9.795	0.657	-1.189	S
H4		9.753	11	10.726	0.588	-1.654	S
H1	Pb µg/l	0.704	0.8	0.756	0.06	-0.861	S
H2		1	1.1	1.034	0.083	-0.406	S
H3		25.442	25.5	24.811	1.314	0.48	S
H4		26.663	27	26.083	1.52	0.382	S
H1	Zn µg/l	11.675	12	12.065	1.301	-0.3	S
H2		9.096	9	9.088	1.789	0.004	S
H3		118.851	115	114.681	8.25	0.505	S
H4		123.323	122	120.844	8.84	0.28	S

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Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
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* Z score in unitless

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<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 51, TERA Environnement (France)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As $\mu\text{g/l}$	0.968	0.9	0.873	0.157	0.606	S
H2		0.707	0.7	0.712	0.057	-0.091	S
H3		7.748	8	7.968	0.706	-0.312	S
H4		11.338	10.5	10.572	1.021	0.75	S
H1	Cd $\mu\text{g/l}$	0.117	0.09	0.087	0.011	2.794	Q
H2		0.116	0.1	0.096	0.008	2.638	S
H3		1.456	1.5	1.486	0.09	-0.329	S
H4		1.425	1.3	1.279	0.081	1.805	S
H1	Cr $\mu\text{g/l}$	1.2	1.1	1.042	0.109	1.449	S
H2		0.6	0.7	0.671	0.056	-1.262	S
H3		6.2	7	6.799	0.349	-1.715	S
H4		7.9	8	7.819	0.365	0.222	S
H1	Cu $\mu\text{g/l}$	1.6	1.3	1.278	0.113	2.843	S
H2		1	1	0.987	0.088	0.143	S
H3		8.4	9	8.657	0.395	-0.65	S
H4		8.3	8	7.764	0.3	1.789	S
H1	Ni $\mu\text{g/l}$	1.524	1.2	1.141	0.117	3.279	Q
H2		0.869	0.9	0.872	0.089	-0.038	S
H3		9.271	10	9.795	0.657	-0.798	S
H4		10.982	11	10.726	0.588	0.436	S
H1	Pb $\mu\text{g/l}$	0.964	0.8	0.756	0.06	3.443	S
H2		1.019	1.1	1.034	0.083	-0.177	S
H3		23.856	25.5	24.811	1.314	-0.727	S
H4		27.002	27	26.083	1.52	0.605	S
H1	Zn $\mu\text{g/l}$	11	12	12.065	1.301	-0.819	S
H2		8.9	9	9.088	1.789	-0.105	S
H3		98	115	114.681	8.25	-2.022	S
H4		101	122	120.844	8.84	-2.245	Q

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NO-2027 KJELLER, Norway
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NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 110, Thüringer Landesanstalt für Landwirtschaft TTL, Jena (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.85	0.9	0.873	0.157	-0.144	S
H2		0.7	0.7	0.712	0.057	-0.214	S
H3		7.72	8	7.968	0.706	-0.352	S
H4		10.2	10.5	10.572	1.021	-0.365	S
H1	Cd µg/l	0.073	0.09	0.087	0.011	-1.321	S
H2		0.085	0.1	0.096	0.008	-1.455	S
H3		1.46	1.5	1.486	0.09	-0.285	S
H4		1.22	1.3	1.279	0.081	-0.738	S
H1	Cr µg/l	1.09	1.1	1.042	0.109	0.442	S
H2		0.7	0.7	0.671	0.056	0.51	S
H3		7.1	7	6.799	0.349	0.861	S
H4		8	8	7.819	0.365	0.496	S
H1	Cu µg/l	1.28	1.3	1.278	0.113	0.019	S
H2		1	1	0.987	0.088	0.143	S
H3		9	9	8.657	0.395	0.868	S
H4		7.8	8	7.764	0.3	0.12	S
H1	Ni µg/l	1.2	1.2	1.141	0.117	0.506	S
H2		0.9	0.9	0.872	0.089	0.312	S
H3		9.9	10	9.795	0.657	0.159	S
H4		10.8	11	10.726	0.588	0.127	S
H1	Pb µg/l	0.73	0.8	0.756	0.06	-0.43	S
H2		1	1.1	1.034	0.083	-0.406	S
H3		24	25.5	24.811	1.314	-0.617	S
H4		25.5	27	26.083	1.52	-0.383	S
H1	Zn µg/l	11.2	12	12.065	1.301	-0.665	S
H2		8.5	9	9.088	1.789	-0.329	S
H3		116	115	114.681	8.25	0.16	S
H4		124	122	120.844	8.84	0.357	S

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Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 112, Niedersächsische Forstliche Versuchsanstalt NVF (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	-999	0.9	0.873	0.157		B
H2		-999	0.7	0.712	0.057		B
H3		-999	8	7.968	0.706		B
H4		-999	10.5	10.572	1.021		B
H1	Cd µg/l	0.087	0.09	0.087	0.011	-0.012	S
H2		0.095	0.1	0.096	0.008	-0.135	S
H3		1.419	1.5	1.486	0.09	-0.742	S
H4		1.235	1.3	1.279	0.081	-0.552	S
H1	Cr µg/l	1.044	1.1	1.042	0.109	0.021	S
H2		0.661	0.7	0.671	0.056	-0.181	S
H3		6.744	7	6.799	0.349	-0.158	S
H4		7.715	8	7.819	0.365	-0.284	S
H1	Cu µg/l	1.162	1.3	1.278	0.113	-1.022	S
H2		0.861	1	0.987	0.088	-1.428	S
H3		8.374	9	8.657	0.395	-0.716	S
H4		7.476	8	7.764	0.3	-0.961	S
H1	Ni µg/l	0.951	1.2	1.141	0.117	-1.625	Q
H2		0.634	0.9	0.872	0.089	-2.692	Q
H3		9.721	10	9.795	0.657	-0.113	S
H4		10.753	11	10.726	0.588	0.047	S
H1	Pb µg/l	< 1.140	0.8	0.756	0.06		B
H2		1.27	1.1	1.034	0.083	2.84	Q
H3		24.29	25.5	24.811	1.314	-0.397	S
H4		25.79	27	26.083	1.52	-0.192	S
H1	Zn µg/l	11.38	12	12.065	1.301	-0.526	S
H2		8.64	9	9.088	1.789	-0.251	S
H3		108.9	115	114.681	8.25	-0.701	S
H4		115.3	122	120.844	8.84	-0.627	S

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Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 114, C.N.R. Istituto Italiano di Idrobiologia (Italy)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As µg/l	0.7	0.9	0.873	0.157	-1.096	S
H2		0.8	0.7	0.712	0.057	1.545	S
H3		10.4	8	7.968	0.706	3.444	U
H4		13.9	10.5	10.572	1.021	3.259	U
H1	Cd µg/l	0.1	0.09	0.087	0.011	1.204	S
H2		0.1	0.1	0.096	0.008	0.525	S
H3		1.6	1.5	1.486	0.09	1.278	S
H4		1.4	1.3	1.279	0.081	1.495	S
H1	Cr µg/l	1.2	1.1	1.042	0.109	1.449	S
H2		0.8	0.7	0.671	0.056	2.282	S
H3		7.4	7	6.799	0.349	1.72	S
H4		8.5	8	7.819	0.365	1.865	S
H1	Cu µg/l	1.5	1.3	1.278	0.113	1.961	S
H2		1.2	1	0.987	0.088	2.404	S
H3		8.2	9	8.657	0.395	-1.156	S
H4		7.4	8	7.764	0.3	-1.214	S
H1	Ni µg/l	1.2	1.2	1.141	0.117	0.506	S
H2		0.9	0.9	0.872	0.089	0.312	S
H3		10.5	10	9.795	0.657	1.072	S
H4		11.8	11	10.726	0.588	1.827	S
H1	Pb µg/l	0.7	0.8	0.756	0.06	-0.927	S
H2		0.8	1.1	1.034	0.083	-2.81	Q
H3		27.8	25.5	24.811	1.314	2.274	S
H4		30.2	27	26.083	1.52	2.709	S
H1	Zn µg/l	12.3	12	12.065	1.301	0.181	S
H2		9.2	9	9.088	1.789	0.063	S
H3		116.3	115	114.681	8.25	0.196	S
H4		124	122	120.844	8.84	0.357	S

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U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 115, Bayerische Landesanstalt f. Wald- und Forstwirtschaft (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.983	0.9	0.873	0.157	0.701	S
H2		0.768	0.7	0.712	0.057	0.982	S
H3		8.87	8	7.968	0.706	1.277	S
H4		11.61	10.5	10.572	1.021	1.016	S
H1	Cd µg/l	0.101	0.09	0.087	0.011	1.298	S
H2		0.113	0.1	0.096	0.008	2.242	S
H3		1.646	1.5	1.486	0.09	1.792	S
H4		1.437	1.3	1.279	0.081	1.954	S
H1	Cr µg/l	0.873	1.1	1.042	0.109	-1.544	Q
H2		0.475	0.7	0.671	0.056	-3.476	Q
H3		6.72	7	6.799	0.349	-0.227	S
H4		7.83	8	7.819	0.365	0.031	S
H1	Cu µg/l	1.292	1.3	1.278	0.113	0.125	S
H2		0.992	1	0.987	0.088	0.053	S
H3		8.88	9	8.657	0.395	0.565	S
H4		8.06	8	7.764	0.3	0.988	S
H1	Ni µg/l	1.119	1.2	1.141	0.117	-0.187	S
H2		0.816	0.9	0.872	0.089	-0.637	S
H3		9.83	10	9.795	0.657	0.053	S
H4		11.11	11	10.726	0.588	0.654	S
H1	Pb µg/l	0.786	0.8	0.756	0.06	0.497	S
H2		1.089	1.1	1.034	0.083	0.664	S
H3		25.4	25.5	24.811	1.314	0.448	S
H4		26.9	27	26.083	1.52	0.538	S
H1	Zn µg/l	12.01	12	12.065	1.301	-0.042	S
H2		9.17	9	9.088	1.789	0.046	S
H3		115.8	115	114.681	8.25	0.136	S
H4		124.7	122	120.844	8.84	0.436	S

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NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

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* Z score in unitless

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U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

B – Blank: You reported either no value or the detection limit

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 117, Standortserkundung/Bodenmonitoring Forsten, Graupa (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	-999	0.9	0.873	0.157		B
H2		-999	0.7	0.712	0.057		B
H3		-999	8	7.968	0.706		B
H4		-999	10.5	10.572	1.021		B
H1	Cd µg/l	0.08	0.09	0.087	0.011	-0.666	S
H2		0.091	0.1	0.096	0.008	-0.663	S
H3		1.487	1.5	1.486	0.09	0.017	S
H4		1.3	1.3	1.279	0.081	0.255	S
H1	Cr µg/l	< 2.000	1.1	1.042	0.109		B
H2		< 2.000	0.7	0.671	0.056		B
H3		8.08	7	6.799	0.349	3.666	Q
H4		8.61	8	7.819	0.365	2.166	S
H1	Cu µg/l	1.21	1.3	1.278	0.113	-0.598	S
H2		0.93	1	0.987	0.088	-0.648	S
H3		8.55	9	8.657	0.395	-0.27	S
H4		7.55	8	7.764	0.3	-0.714	S
H1	Ni µg/l	-999	1.2	1.141	0.117		B
H2		-999	0.9	0.872	0.089		B
H3		-999	10	9.795	0.657		B
H4		-999	11	10.726	0.588		B
H1	Pb µg/l	0.75	0.8	0.756	0.06	-0.099	S
H2		0.89	1.1	1.034	0.083	-1.728	Q
H3		24.73	25.5	24.811	1.314	-0.062	S
H4		27.01	27	26.083	1.52	0.61	S
H1	Zn µg/l	15.33	12	12.065	1.301	2.51	Q
H2		12.33	9	9.088	1.789	1.812	Q
H3		122.67	115	114.681	8.25	0.968	S
H4		130	122	120.844	8.84	1.036	S

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PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 118, Forstliche Versuchs-und Forschungsanstalt (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As µg/l	< 3.000	0.9	0.873	0.157		B
H2		< 3.000	0.7	0.712	0.057		B
H3		< 3.000	8	7.968	0.706	-9.161	U
H4		< 3.000	10.5	10.572	1.021	-8.886	U
H1	Cd µg/l	0.06	0.09	0.087	0.011	-2.537	Q
H2		0.08	0.1	0.096	0.008	-2.116	S
H3		1.58	1.5	1.486	0.09	1.055	S
H4		0.89	1.3	1.279	0.081	-4.831	U
H1	Cr µg/l	1.9	1.1	1.042	0.109	7.858	U
H2		0.9	0.7	0.671	0.056	4.053	Q
H3		7.3	7	6.799	0.349	1.434	S
H4		8.2	8	7.819	0.365	1.044	S
H1	Cu µg/l	3.1	1.3	1.278	0.113	16.081	U
H2		1.3	1	0.987	0.088	3.535	Q
H3		9.3	9	8.657	0.395	1.627	S
H4		8.3	8	7.764	0.3	1.789	S
H1	Ni µg/l	2.4	1.2	1.141	0.117	10.777	U
H2		1.6	0.9	0.872	0.089	8.215	U
H3		10.5	10	9.795	0.657	1.072	S
H4		11.4	11	10.726	0.588	1.147	S
H1	Pb µg/l	0.89	0.8	0.756	0.06	2.218	S
H2		1.22	1.1	1.034	0.083	2.239	S
H3		26.8	25.5	24.811	1.314	1.513	S
H4		28.1	27	26.083	1.52	1.327	S
H1	Zn µg/l	13	12	12.065	1.301	0.719	S
H2		10	9	9.088	1.789	0.51	S
H3		115	115	114.681	8.25	0.039	S
H4		120	122	120.844	8.84	-0.096	S

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Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
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NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 120, Landwirtschaftliche Untersuchungs- und Forschungsanstalt LUFA (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.918	0.9	0.873	0.157	0.288	S
H2		0.747	0.7	0.712	0.057	0.613	S
H3		8.16	8	7.968	0.706	0.272	S
H4		10.457	10.5	10.572	1.021	-0.113	S
H1	Cd µg/l	0.09	0.09	0.087	0.011	0.269	S
H2		0.098	0.1	0.096	0.008	0.261	S
H3		1.505	1.5	1.486	0.09	0.218	S
H4		1.277	1.3	1.279	0.081	-0.031	S
H1	Cr µg/l	1	1.1	1.042	0.109	-0.382	S
H2		0.59	0.7	0.671	0.056	-1.439	S
H3		7.116	7	6.799	0.349	0.907	S
H4		8.106	8	7.819	0.365	0.786	S
H1	Cu µg/l	1.25	1.3	1.278	0.113	-0.245	S
H2		0.919	1	0.987	0.088	-0.772	S
H3		9.373	9	8.657	0.395	1.812	S
H4		8.348	8	7.764	0.3	1.949	S
H1	Ni µg/l	1.205	1.2	1.141	0.117	0.549	S
H2		0.926	0.9	0.872	0.089	0.605	S
H3		10.249	10	9.795	0.657	0.69	S
H4		11.428	11	10.726	0.588	1.195	S
H1	Pb µg/l	0.789	0.8	0.756	0.06	0.546	S
H2		1.096	1.1	1.034	0.083	0.748	S
H3		25.316	25.5	24.811	1.314	0.384	S
H4		26.514	27	26.083	1.52	0.284	S
H1	Zn µg/l	11.573	12	12.065	1.301	-0.378	S
H2		8.543	9	9.088	1.789	-0.305	S
H3		115.75	115	114.681	8.25	0.13	S
H4		122.62	122	120.844	8.84	0.201	S

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PO Box 100
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Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
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Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 121, Landeslabor Schleswig-Holsteinmwelt (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As µg/l	0.871	0.9	0.873	0.157	-0.01	S
H2		0.696	0.7	0.712	0.057	-0.284	S
H3		7.61	8	7.968	0.706	-0.507	S
H4		10	10.5	10.572	1.021	-0.56	S
H1	Cd µg/l	0.104	0.09	0.087	0.011	1.578	S
H2		0.099	0.1	0.096	0.008	0.354	S
H3		1.49	1.5	1.486	0.09	0.05	S
H4		1.24	1.3	1.279	0.081	-0.49	S
H1	Cr µg/l	1	1.1	1.042	0.109	-0.382	S
H2		0.696	0.7	0.671	0.056	0.439	S
H3		7.06	7	6.799	0.349	0.747	S
H4		8	8	7.819	0.365	0.496	S
H1	Cu µg/l	1.31	1.3	1.278	0.113	0.284	S
H2		1.2	1	0.987	0.088	2.404	S
H3		8.76	9	8.657	0.395	0.261	S
H4		7.75	8	7.764	0.3	-0.046	S
H1	Ni µg/l	1.15	1.2	1.141	0.117	0.078	S
H2		0.874	0.9	0.872	0.089	0.018	S
H3		9.7	10	9.795	0.657	-0.145	S
H4		10.8	11	10.726	0.588	0.127	S
H1	Pb µg/l	0.79	0.8	0.756	0.06	0.563	S
H2		1.07	1.1	1.034	0.083	0.436	S
H3		24.4	25.5	24.811	1.314	-0.313	S
H4		25.5	27	26.083	1.52	-0.383	S
H1	Zn µg/l	12.3	12	12.065	1.301	0.181	S
H2		9.51	9	9.088	1.789	0.236	S
H3		114	115	114.681	8.25	-0.083	S
H4		120	122	120.844	8.84	-0.096	S

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NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
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* Z score in unitless

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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 124, Laboratorium voor Bondemkunde, Gent (Belgium)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	< 15.000	0.9	0.873	0.157		B
H2		< 15.000	0.7	0.712	0.057		B
H3		< 15.000	8	7.968	0.706		B
H4		< 15.000	10.5	10.572	1.021		B
H1	Cd µg/l	< 2.000	0.09	0.087	0.011		B
H2		< 2.000	0.1	0.096	0.008		B
H3		< 2.000	1.5	1.486	0.09		B
H4		< 2.000	1.3	1.279	0.081		B
H1	Cr µg/l	< 2.000	1.1	1.042	0.109		B
H2		< 2.000	0.7	0.671	0.056		B
H3		6.9	7	6.799	0.349	0.289	S
H4		8	8	7.819	0.365	0.496	S
H1	Cu µg/l	< 2.000	1.3	1.278	0.113		B
H2		< 2.000	1	0.987	0.088		B
H3		8.4	9	8.657	0.395	-0.65	S
H4		7.7	8	7.764	0.3	-0.213	S
H1	Ni µg/l	< 2.000	1.2	1.141	0.117		B
H2		< 2.000	0.9	0.872	0.089		B
H3		9.6	10	9.795	0.657	-0.297	S
H4		10.5	11	10.726	0.588	-0.384	S
H1	Pb µg/l	< 5.000	0.8	0.756	0.06		B
H2		< 5.000	1.1	1.034	0.083		B
H3		24.5	25.5	24.811	1.314	-0.237	S
H4		23.2	27	26.083	1.52	-1.896	S
H1	Zn µg/l	11.8	12	12.065	1.301	-0.204	S
H2		7.8	9	9.088	1.789	-0.72	S
H3		114.6	115	114.681	8.25	-0.01	S
H4		121.6	122	120.844	8.84	0.085	S

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Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 125, Bayerisches Landesamt für Umweltschutz, Augsburg (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.964	0.9	0.873	0.157	0.58	S
H2		0.74	0.7	0.712	0.057	0.49	S
H3		8.647	8	7.968	0.706	0.961	S
H4		11.03	10.5	10.572	1.021	0.448	S
H1	Cd µg/l	0.095	0.09	0.087	0.011	0.736	S
H2		0.104	0.1	0.096	0.008	1.054	S
H3		1.58	1.5	1.486	0.09	1.055	S
H4		1.33	1.3	1.279	0.081	0.627	S
H1	Cr µg/l	1.11	1.1	1.042	0.109	0.625	S
H2		0.693	0.7	0.671	0.056	0.386	S
H3		7.18	7	6.799	0.349	1.09	S
H4		7.88	8	7.819	0.365	0.168	S
H1	Cu µg/l	1.41	1.3	1.278	0.113	1.167	S
H2		1.08	1	0.987	0.088	1.048	S
H3		9.53	9	8.657	0.395	2.209	S
H4		8.19	8	7.764	0.3	1.422	S
H1	Ni µg/l	0.793	1.2	1.141	0.117	-2.978	U
H2		1.07	0.9	0.872	0.089	2.231	S
H3		25.9	10	9.795	0.657	24.5	U
H4		26.65	11	10.726	0.588	27.082	U
H1	Pb µg/l	1.21	0.8	0.756	0.06	7.515	U
H2		0.897	1.1	1.034	0.083	-1.644	Q
H3		10.36	25.5	24.811	1.314	-10.996	U
H4		11.06	27	26.083	1.52	-9.882	U
H1	Zn µg/l	13.54	12	12.065	1.301	1.134	S
H2		10.2	9	9.088	1.789	0.622	S
H3		133.2	115	114.681	8.25	2.245	Q
H4		137.3	122	120.844	8.84	1.862	S

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NILU – Norsk institutt for luftforskning
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NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 129, Ecole Nationale d'ingénieurs de Sfax (Tunisia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	3.001	0.9	0.873	0.157	13.515	U
H2		1.718	0.7	0.712	0.057	17.693	U
H3		12.2	8	7.968	0.706	5.993	U
H4		12.226	10.5	10.572	1.021	1.62	Q
H1	Cd µg/l	0.07	0.09	0.087	0.011	-1.602	S
H2		0.1	0.1	0.096	0.008	0.525	S
H3		1.326	1.5	1.486	0.09	-1.78	S
H4		1.318	1.3	1.279	0.081	0.478	S
H1	Cr µg/l	0.978	1.1	1.042	0.109	-0.583	S
H2		0.563	0.7	0.671	0.056	-1.917	S
H3		6	7	6.799	0.349	-2.288	S
H4		6.153	8	7.819	0.365	-4.56	Q
H1	Cu µg/l	1.251	1.3	1.278	0.113	-0.236	S
H2		1.086	1	0.987	0.088	1.116	S
H3		7.695	9	8.657	0.395	-2.434	S
H4		7.778	8	7.764	0.3	0.047	S
H1	Ni µg/l	1.03	1.2	1.141	0.117	-0.949	S
H2		0.807	0.9	0.872	0.089	-0.738	S
H3		8.631	10	9.795	0.657	-1.771	S
H4		8.864	11	10.726	0.588	-3.166	Q
H1	Pb µg/l	0.759	0.8	0.756	0.06	0.05	S
H2		1.294	1.1	1.034	0.083	3.128	Q
H3		23.756	25.5	24.811	1.314	-0.803	S
H4		23.502	27	26.083	1.52	-1.698	S
H1	Zn µg/l	9.446	12	12.065	1.301	-2.013	Q
H2		7.695	9	9.088	1.789	-0.779	S
H3		99.935	115	114.681	8.25	-1.787	S
H4		98.57	122	120.844	8.84	-2.52	Q

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 132, Comision Chilena de Energia Nuclear (Chile)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As µg/l	< 10.000	0.9	0.873	0.157		B
H2		< 10.000	0.7	0.712	0.057		B
H3		< 10.000	8	7.968	0.706		B
H4		< 10.000	10.5	10.572	1.021	-5.458	U
H1	Cd µg/l	< 5.000	0.09	0.087	0.011		B
H2		< 5.000	0.1	0.096	0.008		B
H3		< 5.000	1.5	1.486	0.09		B
H4		< 5.000	1.3	1.279	0.081		B
H1	Cr µg/l	< 5.000	1.1	1.042	0.109		B
H2		< 5.000	0.7	0.671	0.056		B
H3		6.89	7	6.799	0.349	0.26	S
H4		7.74	8	7.819	0.365	-0.216	S
H1	Cu µg/l	< 5.000	1.3	1.278	0.113		B
H2		< 5.000	1	0.987	0.088		B
H3		8.25	9	8.657	0.395	-1.029	S
H4		6.65	8	7.764	0.3	-3.716	Q
H1	Ni µg/l	< 5.000	1.2	1.141	0.117		B
H2		< 5.000	0.9	0.872	0.089		B
H3		11.25	10	9.795	0.657	2.213	S
H4		11.16	11	10.726	0.588	0.739	S
H1	Pb µg/l	< 5.000	0.8	0.756	0.06		B
H2		< 5.000	1.1	1.034	0.083		B
H3		24.34	25.5	24.811	1.314	-0.359	S
H4		25.77	27	26.083	1.52	-0.206	S
H1	Zn µg/l	10.98	12	12.065	1.301	-0.834	S
H2		8.24	9	9.088	1.789	-0.474	S
H3		110.2	115	114.681	8.25	-0.543	S
H4		115.5	122	120.844	8.84	-0.605	S

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NO-2027 KJELLER, Norway
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Framsenteret / The Fram Centre
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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 141, Marine Division, Global Environment and Marine Department, Japan Meteorological Agency, Tokyo (Japan)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As µg/l	-999	0.9	0.873	0.157		B
H2		-999	0.7	0.712	0.057		B
H3		-999	8	7.968	0.706		B
H4		-999	10.5	10.572	1.021		B
H1	Cd µg/l	0.07	0.09	0.087	0.011	-1.602	S
H2		0.087	0.1	0.096	0.008	-1.191	S
H3		1.445	1.5	1.486	0.09	-0.452	S
H4		1.255	1.3	1.279	0.081	-0.304	S
H1	Cr µg/l	-999	1.1	1.042	0.109		B
H2		-999	0.7	0.671	0.056		B
H3		-999	7	6.799	0.349		B
H4		-999	8	7.819	0.365		B
H1	Cu µg/l	-999	1.3	1.278	0.113		B
H2		-999	1	0.987	0.088		B
H3		-999	9	8.657	0.395		B
H4		-999	8	7.764	0.3		B
H1	Ni µg/l	-999	1.2	1.141	0.117		B
H2		-999	0.9	0.872	0.089		B
H3		-999	10	9.795	0.657		B
H4		-999	11	10.726	0.588		B
H1	Pb µg/l	-999	0.8	0.756	0.06		B
H2		-999	1.1	1.034	0.083		B
H3		-999	25.5	24.811	1.314		B
H4		-999	27	26.083	1.52		B
H1	Zn µg/l	-999	12	12.065	1.301		B
H2		-999	9	9.088	1.789		B
H3		-999	115	114.681	8.25		B
H4		-999	122	120.844	8.84		B

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NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
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NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

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* Z score in unitless

✘ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 145, Estonian Environmental Research Centre, Tartu laboratory (Estonia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.839	0.9	0.873	0.157	-0.214	S
H2		0.67	0.7	0.712	0.057	-0.742	S
H3		7.56	8	7.968	0.706	-0.578	S
H4		9.94	10.5	10.572	1.021	-0.619	S
H1	Cd µg/l	0.083	0.09	0.087	0.011	-0.386	S
H2		0.096	0.1	0.096	0.008	-0.056	S
H3		1.43	1.5	1.486	0.09	-0.62	S
H4		1.23	1.3	1.279	0.081	-0.614	S
H1	Cr µg/l	1.06	1.1	1.042	0.109	0.168	S
H2		0.675	0.7	0.671	0.056	0.067	S
H3		6.82	7	6.799	0.349	0.06	S
H4		7.79	8	7.819	0.365	-0.079	S
H1	Cu µg/l	1.21	1.3	1.278	0.113	-0.598	S
H2		0.909	1	0.987	0.088	-0.885	S
H3		8.37	9	8.657	0.395	-0.726	S
H4		7.43	8	7.764	0.3	-1.114	S
H1	Ni µg/l	1.11	1.2	1.141	0.117	-0.264	S
H2		0.856	0.9	0.872	0.089	-0.185	S
H3		9.38	10	9.795	0.657	-0.632	S
H4		10.3	11	10.726	0.588	-0.724	S
H1	Pb µg/l	0.749	0.8	0.756	0.06	-0.116	S
H2		1.04	1.1	1.034	0.083	0.075	S
H3		24.2	25.5	24.811	1.314	-0.465	S
H4		25.7	27	26.083	1.52	-0.252	S
H1	Zn µg/l	10.9	12	12.065	1.301	-0.895	S
H2		8.08	9	9.088	1.789	-0.564	S
H3		107	115	114.681	8.25	-0.931	S
H4		112	122	120.844	8.84	-1.001	S

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NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 146, Luxembourg Institute of Science and Technology (LIST) (Luxembourg)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.845	0.9	0.873	0.157	-0.175	S
H2		0.64	0.7	0.712	0.057	-1.269	S
H3		7.356	8	7.968	0.706	-0.867	S
H4		9.584	10.5	10.572	1.021	-0.968	S
H1	Cd µg/l	0.086	0.09	0.087	0.011	-0.105	S
H2		0.098	0.1	0.096	0.008	0.261	S
H3		1.43	1.5	1.486	0.09	-0.62	S
H4		1.252	1.3	1.279	0.081	-0.341	S
H1	Cr µg/l	1.028	1.1	1.042	0.109	-0.125	S
H2		0.65	0.7	0.671	0.056	-0.376	S
H3		6.635	7	6.799	0.349	-0.47	S
H4		7.505	8	7.819	0.365	-0.859	S
H1	Cu µg/l	1.224	1.3	1.278	0.113	-0.475	S
H2		0.961	1	0.987	0.088	-0.297	S
H3		9.011	9	8.657	0.395	0.896	S
H4		7.899	8	7.764	0.3	0.451	S
H1	Ni µg/l	1.126	1.2	1.141	0.117	-0.127	S
H2		0.87	0.9	0.872	0.089	-0.027	S
H3		9.679	10	9.795	0.657	-0.177	S
H4		10.68	11	10.726	0.588	-0.078	S
H1	Pb µg/l	0.764	0.8	0.756	0.06	0.132	S
H2		1.045	1.1	1.034	0.083	0.135	S
H3		24.28	25.5	24.811	1.314	-0.404	S
H4		25.58	27	26.083	1.52	-0.331	S
H1	Zn µg/l	11.41	12	12.065	1.301	-0.503	S
H2		8.751	9	9.088	1.789	-0.188	S
H3		109.7	115	114.681	8.25	-0.604	S
H4		115.4	122	120.844	8.84	-0.616	S

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Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 166, Forest Research Institute, Laboratory of Forest Environment Chemistry (Poland)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As µg/l	-999	0.9	0.873	0.157		B
H2		-999	0.7	0.712	0.057		B
H3		-999	8	7.968	0.706		B
H4		-999	10.5	10.572	1.021		B
H1	Cd µg/l	< 0.500	0.09	0.087	0.011		B
H2		< 0.500	0.1	0.096	0.008		B
H3		1.55	1.5	1.486	0.09	0.72	S
H4		1.319	1.3	1.279	0.081	0.49	S
H1	Cr µg/l	-999	1.1	1.042	0.109		B
H2		-999	0.7	0.671	0.056		B
H3		-999	7	6.799	0.349		B
H4		-999	8	7.819	0.365		B
H1	Cu µg/l	-999	1.3	1.278	0.113		B
H2		-999	1	0.987	0.088		B
H3		-999	9	8.657	0.395		B
H4		-999	8	7.764	0.3		B
H1	Ni µg/l	-999	1.2	1.141	0.117		B
H2		-999	0.9	0.872	0.089		B
H3		-999	10	9.795	0.657		B
H4		-999	11	10.726	0.588		B
H1	Pb µg/l	< 10.000	0.8	0.756	0.06		B
H2		< 10.000	1.1	1.034	0.083		B
H3		25.246	25.5	24.811	1.314	0.331	S
H4		27.232	27	26.083	1.52	0.756	S
H1	Zn µg/l	11.279	12	12.065	1.301	-0.604	S
H2		8.23	9	9.088	1.789	-0.48	S
H3		117.98	115	114.681	8.25	0.4	S
H4		124.55	122	120.844	8.84	0.419	S

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Besøk/visit: Instituttveien 18, 2007 Kjeller

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Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

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Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 169, Lancaster Environment Centre, Centre for Ecology and Hydrology (United Kingdom)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.844	0.9	0.873	0.157	-0.182	S
H2		0.642	0.7	0.712	0.057	-1.234	S
H3		7.3	8	7.968	0.706	-0.946	S
H4		9.68	10.5	10.572	1.021	-0.874	S
H1	Cd µg/l	0.087	0.09	0.087	0.011	0.016	S
H2		0.097	0.1	0.096	0.008	0.129	S
H3		1.46	1.5	1.486	0.09	-0.285	S
H4		1.25	1.3	1.279	0.081	-0.366	S
H1	Cr µg/l	1.08	1.1	1.042	0.109	0.351	S
H2		0.651	0.7	0.671	0.056	-0.358	S
H3		6.89	7	6.799	0.349	0.26	S
H4		8.01	8	7.819	0.365	0.523	S
H1	Cu µg/l	1.24	1.3	1.278	0.113	-0.334	S
H2		0.947	1	0.987	0.088	-0.456	S
H3		8.49	9	8.657	0.395	-0.422	S
H4		7.73	8	7.764	0.3	-0.113	S
H1	Ni µg/l	1.13	1.2	1.141	0.117	-0.093	S
H2		0.856	0.9	0.872	0.089	-0.185	S
H3		9.5	10	9.795	0.657	-0.449	S
H4		10.6	11	10.726	0.588	-0.214	S
H1	Pb µg/l	0.782	0.8	0.756	0.06	0.43	S
H2		1.05	1.1	1.034	0.083	0.195	S
H3		24.5	25.5	24.811	1.314	-0.237	S
H4		25.9	27	26.083	1.52	-0.12	S
H1	Zn µg/l	12.1	12	12.065	1.301	0.027	S
H2		9.08	9	9.088	1.789	-0.005	S
H3		110	115	114.681	8.25	-0.567	S
H4		117	122	120.844	8.84	-0.435	S

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NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
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Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

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* Z score in unitless

✘ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 171, Mines Douai, Departement Sciences de l'Atmosphere et Genie de l'Environnement (France)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As µg/l	0.891	0.9	0.873	0.157	0.117	S
H2		0.697	0.7	0.712	0.057	-0.267	S
H3		7.338	8	7.968	0.706	-0.893	S
H4		9.476	10.5	10.572	1.021	-1.074	S
H1	Cd µg/l	0.086	0.09	0.087	0.011	-0.105	S
H2		0.097	0.1	0.096	0.008	0.129	S
H3		1.369	1.5	1.486	0.09	-1.3	S
H4		1.167	1.3	1.279	0.081	-1.395	S
H1	Cr µg/l	0.991	1.1	1.042	0.109	-0.464	S
H2		0.634	0.7	0.671	0.056	-0.659	S
H3		6.567	7	6.799	0.349	-0.665	S
H4		7.437	8	7.819	0.365	-1.045	S
H1	Cu µg/l	1.204	1.3	1.278	0.113	-0.651	S
H2		0.942	1	0.987	0.088	-0.512	S
H3		8.35	9	8.657	0.395	-0.776	S
H4		7.405	8	7.764	0.3	-1.197	S
H1	Ni µg/l	1.101	1.2	1.141	0.117	-0.341	S
H2		0.833	0.9	0.872	0.089	-0.445	S
H3		9.345	10	9.795	0.657	-0.685	S
H4		10.146	11	10.726	0.588	-0.986	S
H1	Pb µg/l	0.717	0.8	0.756	0.06	-0.646	S
H2		0.999	1.1	1.034	0.083	-0.418	S
H3		23.12	25.5	24.811	1.314	-1.287	S
H4		24.153	27	26.083	1.52	-1.269	S
H1	Zn µg/l	12.464	12	12.065	1.301	0.307	S
H2		9.618	9	9.088	1.789	0.296	S
H3		107.473	115	114.681	8.25	-0.874	S
H4		112.625	122	120.844	8.84	-0.93	S

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NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 175, Primorsky Environmental Pollution Monitoring Center, Vladivostok (Russian Federation)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As µg/l	1.01	0.9	0.873	0.157	0.872	S
H2		0.92	0.7	0.712	0.057	3.656	Q
H3		8.43	8	7.968	0.706	0.654	S
H4		13.23	10.5	10.572	1.021	2.603	Q
H1	Cd µg/l	0.09	0.09	0.087	0.011	0.269	S
H2		0.095	0.1	0.096	0.008	-0.135	S
H3		1.465	1.5	1.486	0.09	-0.229	S
H4		1.25	1.3	1.279	0.081	-0.366	S
H1	Cr µg/l	1.4	1.1	1.042	0.109	3.28	Q
H2		0.8	0.7	0.671	0.056	2.282	S
H3		7.8	7	6.799	0.349	2.865	S
H4		8.95	8	7.819	0.365	3.097	S
H1	Cu µg/l	1.2	1.3	1.278	0.113	-0.687	S
H2		0.9	1	0.987	0.088	-0.987	S
H3		8.75	9	8.657	0.395	0.236	S
H4		7.7	8	7.764	0.3	-0.213	S
H1	Ni µg/l	1.1	1.2	1.141	0.117	-0.35	S
H2		0.92	0.9	0.872	0.089	0.537	S
H3		9.3	10	9.795	0.657	-0.753	S
H4		10.5	11	10.726	0.588	-0.384	S
H1	Pb µg/l	0.7	0.8	0.756	0.06	-0.927	S
H2		0.85	1.1	1.034	0.083	-2.209	Q
H3		26.2	25.5	24.811	1.314	1.057	S
H4		27.75	27	26.083	1.52	1.097	S
H1	Zn µg/l	18	12	12.065	1.301	4.562	U
H2		14	9	9.088	1.789	2.746	U
H3		121	115	114.681	8.25	0.766	S
H4		121	122	120.844	8.84	0.018	S

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PO Box 100
NO-2027 KJELLER, Norway
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NILU – Norsk institutt for luftforskning
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NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 178, Environmental Chemistry and EANET Monitoring Laboratory, Limnological Institute
RAS/SB, Irkutsk (Russian Federation)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As µg/l	0.89	0.9	0.873	0.157	0.11	S
H2		0.72	0.7	0.712	0.057	0.138	S
H3		9.46	8	7.968	0.706	2.113	Q
H4		12.2	10.5	10.572	1.021	1.594	Q
H1	Cd µg/l	0.08	0.09	0.087	0.011	-0.666	S
H2		0.1	0.1	0.096	0.008	0.525	S
H3		1.71	1.5	1.486	0.09	2.506	S
H4		1.46	1.3	1.279	0.081	2.239	S
H1	Cr µg/l	1.09	1.1	1.042	0.109	0.442	S
H2		0.73	0.7	0.671	0.056	1.041	S
H3		7.11	7	6.799	0.349	0.89	S
H4		8.16	8	7.819	0.365	0.934	S
H1	Cu µg/l	1.32	1.3	1.278	0.113	0.372	S
H2		1	1	0.987	0.088	0.143	S
H3		10.75	9	8.657	0.395	5.296	Q
H4		9.62	8	7.764	0.3	6.192	Q
H1	Ni µg/l	1.19	1.2	1.141	0.117	0.42	S
H2		0.89	0.9	0.872	0.089	0.199	S
H3		10.52	10	9.795	0.657	1.103	S
H4		11.47	11	10.726	0.588	1.266	S
H1	Pb µg/l	0.77	0.8	0.756	0.06	0.232	S
H2		1.06	1.1	1.034	0.083	0.315	S
H3		25.16	25.5	24.811	1.314	0.265	S
H4		26.46	27	26.083	1.52	0.248	S
H1	Zn µg/l	11.66	12	12.065	1.301	-0.311	S
H2		8.9	9	9.088	1.789	-0.105	S
H3		128.2	115	114.681	8.25	1.639	S
H4		136.6	122	120.844	8.84	1.782	S

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PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 179, Murmansk Environmental Monitoring Center, Murmansk (Russian Federation)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.94	0.9	0.873	0.157	0.428	S
H2		0.71	0.7	0.712	0.057	-0.038	S
H3		6.83	8	7.968	0.706	-1.612	S
H4		10.31	10.5	10.572	1.021	-0.257	S
H1	Cd µg/l	0.07	0.09	0.087	0.011	-1.602	S
H2		0.08	0.1	0.096	0.008	-2.116	S
H3		1.02	1.5	1.486	0.09	-5.196	U
H4		0.99	1.3	1.279	0.081	-3.591	Q
H1	Cr µg/l	0.75	1.1	1.042	0.109	-2.67	U
H2		0.47	0.7	0.671	0.056	-3.565	Q
H3		5.37	7	6.799	0.349	-4.091	Q
H4		6.71	8	7.819	0.365	-3.035	Q
H1	Cu µg/l	1.55	1.3	1.278	0.113	2.402	S
H2		0.97	1	0.987	0.088	-0.196	S
H3		8.62	9	8.657	0.395	-0.093	S
H4		7.22	8	7.764	0.3	-1.815	S
H1	Ni µg/l	1.11	1.2	1.141	0.117	-0.264	S
H2		0.76	0.9	0.872	0.089	-1.269	S
H3		10.07	10	9.795	0.657	0.418	S
H4		11.27	11	10.726	0.588	0.926	S
H1	Pb µg/l	0.6	0.8	0.756	0.06	-2.582	Q
H2		0.9	1.1	1.034	0.083	-1.608	Q
H3		28.9	25.5	24.811	1.314	3.111	S
H4		29.7	27	26.083	1.52	2.38	S
H1	Zn µg/l	11.73	12	12.065	1.301	-0.257	S
H2		9	9	9.088	1.789	-0.049	S
H3		117.5	115	114.681	8.25	0.342	S
H4		125.43	122	120.844	8.84	0.519	S

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Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 181, TNO innovation for life (The Netherlands)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.86	0.9	0.873	0.157	-0.08	S
H2		0.74	0.7	0.712	0.057	0.49	S
H3		7.9	8	7.968	0.706	-0.097	S
H4		10	10.5	10.572	1.021	-0.56	S
H1	Cd µg/l	0.081	0.09	0.087	0.011	-0.573	S
H2		0.082	0.1	0.096	0.008	-1.852	S
H3		1.6	1.5	1.486	0.09	1.278	S
H4		1.3	1.3	1.279	0.081	0.255	S
H1	Cr µg/l	1	1.1	1.042	0.109	-0.382	S
H2		0.66	0.7	0.671	0.056	-0.199	S
H3		6.7	7	6.799	0.349	-0.284	S
H4		7.8	8	7.819	0.365	-0.051	S
H1	Cu µg/l	1.3	1.3	1.278	0.113	0.196	S
H2		0.97	1	0.987	0.088	-0.196	S
H3		9.1	9	8.657	0.395	1.121	S
H4		8	8	7.764	0.3	0.788	S
H1	Ni µg/l	1.2	1.2	1.141	0.117	0.506	S
H2		0.93	0.9	0.872	0.089	0.65	S
H3		9.9	10	9.795	0.657	0.159	S
H4		11	11	10.726	0.588	0.467	S
H1	Pb µg/l	0.8	0.8	0.756	0.06	0.728	S
H2		1.1	1.1	1.034	0.083	0.796	S
H3		26	25.5	24.811	1.314	0.905	S
H4		27	27	26.083	1.52	0.604	S
H1	Zn µg/l	12	12	12.065	1.301	-0.05	S
H2		9.1	9	9.088	1.789	0.007	S
H3		116	115	114.681	8.25	0.16	S
H4		122	122	120.844	8.84	0.131	S

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NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
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* Z score in unitless

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Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 184, Institute for Public Health Pozarevac (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As µg/l	-999	0.9	0.873	0.157		B
H2		-999	0.7	0.712	0.057		B
H3		7.68	8	7.968	0.706	-0.408	S
H4		10.19	10.5	10.572	1.021	-0.374	S
H1	Cd µg/l	-999	0.09	0.087	0.011		B
H2		-999	0.1	0.096	0.008		B
H3		1.46	1.5	1.486	0.09	-0.285	S
H4		1.25	1.3	1.279	0.081	-0.366	S
H1	Cr µg/l	-999	1.1	1.042	0.109		B
H2		-999	0.7	0.671	0.056		B
H3		6.54	7	6.799	0.349	-0.742	S
H4		7.66	8	7.819	0.365	-0.435	S
H1	Cu µg/l	-999	1.3	1.278	0.113		B
H2		-999	1	0.987	0.088		B
H3		8.81	9	8.657	0.395	0.388	S
H4		7.69	8	7.764	0.3	-0.247	S
H1	Ni µg/l	-999	1.2	1.141	0.117		B
H2		-999	0.9	0.872	0.089		B
H3		10.24	10	9.795	0.657	0.677	S
H4		10.62	11	10.726	0.588	-0.18	S
H1	Pb µg/l	-999	0.8	0.756	0.06		B
H2		-999	1.1	1.034	0.083		B
H3		23.43	25.5	24.811	1.314	-1.051	S
H4		24.59	27	26.083	1.52	-0.982	S
H1	Zn µg/l	-999	12	12.065	1.301		B
H2		-999	9	9.088	1.789		B
H3		113	115	114.681	8.25	-0.204	S
H4		120	122	120.844	8.84	-0.096	S

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NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 185, Public Health Centre - Cacak, Department for Sanitary Chemistry and Ecotoxicology (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As µg/l	-999	0.9	0.873	0.157		B
H2		-999	0.7	0.712	0.057		B
H3		7.9	8	7.968	0.706	-0.097	S
H4		10.1	10.5	10.572	1.021	-0.463	S
H1	Cd µg/l	-999	0.09	0.087	0.011		B
H2		-999	0.1	0.096	0.008		B
H3		1.3	1.5	1.486	0.09	-2.071	S
H4		1.1	1.3	1.279	0.081	-2.226	Q
H1	Cr µg/l	-999	1.1	1.042	0.109		B
H2		-999	0.7	0.671	0.056		B
H3		-999	7	6.799	0.349		B
H4		-999	8	7.819	0.365		B
H1	Cu µg/l	-999	1.3	1.278	0.113		B
H2		-999	1	0.987	0.088		B
H3		-999	9	8.657	0.395		B
H4		-999	8	7.764	0.3		B
H1	Ni µg/l	-999	1.2	1.141	0.117		B
H2		-999	0.9	0.872	0.089		B
H3		8	10	9.795	0.657	-2.731	Q
H4		10	11	10.726	0.588	-1.234	S
H1	Pb µg/l	-999	0.8	0.756	0.06		B
H2		-999	1.1	1.034	0.083		B
H3		23	25.5	24.811	1.314	-1.378	S
H4		24	27	26.083	1.52	-1.37	S
H1	Zn µg/l	-999	12	12.065	1.301		B
H2		-999	9	9.088	1.789		B
H3		-999	115	114.681	8.25		B
H4		-999	122	120.844	8.84		B

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Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 187, Public Health Institute - Nis, Department for Sanitary Chemistry (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.919	0.9	0.873	0.157	0.294	S
H2		0.711	0.7	0.712	0.057	-0.021	S
H3		7.97	8	7.968	0.706	0.002	S
H4		10.55	10.5	10.572	1.021	-0.022	S
H1	Cd µg/l	0.088	0.09	0.087	0.011	0.082	S
H2		0.09	0.1	0.096	0.008	-0.795	S
H3		1.56	1.5	1.486	0.09	0.832	S
H4		1.33	1.3	1.279	0.081	0.627	S
H1	Cr µg/l	0.105	1.1	1.042	0.109	-8.575	U
H2		0.756	0.7	0.671	0.056	1.502	S
H3		7.28	7	6.799	0.349	1.376	S
H4		8.08	8	7.819	0.365	0.715	S
H1	Cu µg/l	1.23	1.3	1.278	0.113	-0.422	S
H2		1.09	1	0.987	0.088	1.161	S
H3		8.92	9	8.657	0.395	0.666	S
H4		8.01	8	7.764	0.3	0.821	S
H1	Ni µg/l	1.22	1.2	1.141	0.117	0.677	S
H2		0.945	0.9	0.872	0.089	0.82	S
H3		10.17	10	9.795	0.657	0.57	S
H4		11.17	11	10.726	0.588	0.756	S
H1	Pb µg/l	0.751	0.8	0.756	0.06	-0.083	S
H2		1.02	1.1	1.034	0.083	-0.165	S
H3		24.49	25.5	24.811	1.314	-0.244	S
H4		25.73	27	26.083	1.52	-0.232	S
H1	Zn µg/l	12.19	12	12.065	1.301	0.096	S
H2		9.38	9	9.088	1.789	0.163	S
H3		118.2	115	114.681	8.25	0.427	S
H4		126.1	122	120.844	8.84	0.595	S

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Laboratory 189, Institute of Public Health - Kikinda (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	-999	0.9	0.873	0.157		B
H2		-999	0.7	0.712	0.057		B
H3		7.723	8	7.968	0.706	-0.347	S
H4		10.276	10.5	10.572	1.021	-0.29	S
H1	Cd µg/l	-999	0.09	0.087	0.011		B
H2		-999	0.1	0.096	0.008		B
H3		1.483	1.5	1.486	0.09	-0.028	S
H4		1.256	1.3	1.279	0.081	-0.291	S
H1	Cr µg/l	-999	1.1	1.042	0.109		B
H2		-999	0.7	0.671	0.056		B
H3		6.651	7	6.799	0.349	-0.424	S
H4		7.823	8	7.819	0.365	0.012	S
H1	Cu µg/l	-999	1.3	1.278	0.113		B
H2		-999	1	0.987	0.088		B
H3		8.831	9	8.657	0.395	0.441	S
H4		7.735	8	7.764	0.3	-0.097	S
H1	Ni µg/l	-999	1.2	1.141	0.117		B
H2		-999	0.9	0.872	0.089		B
H3		10.244	10	9.795	0.657	0.683	S
H4		10.863	11	10.726	0.588	0.234	S
H1	Pb µg/l	-999	0.8	0.756	0.06		B
H2		-999	1.1	1.034	0.083		B
H3		23.713	25.5	24.811	1.314	-0.836	S
H4		24.825	27	26.083	1.52	-0.827	S
H1	Zn µg/l	-999	12	12.065	1.301		B
H2		-999	9	9.088	1.789		B
H3		113.652	115	114.681	8.25	-0.125	S
H4		121.581	122	120.844	8.84	0.083	S

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Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

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Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 193, Institute of Public Health of Vojvodina (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	0.9	0.9	0.873	0.157	0.174	S
H2		0.694	0.7	0.712	0.057	-0.32	S
H3		7.779	8	7.968	0.706	-0.268	S
H4		10.226	10.5	10.572	1.021	-0.339	S
H1	Cd µg/l	0.089	0.09	0.087	0.011	0.175	S
H2		0.091	0.1	0.096	0.008	-0.663	S
H3		1.511	1.5	1.486	0.09	0.285	S
H4		1.287	1.3	1.279	0.081	0.093	S
H1	Cr µg/l	1.13	1.1	1.042	0.109	0.809	S
H2		0.741	0.7	0.671	0.056	1.236	S
H3		7.114	7	6.799	0.349	0.901	S
H4		8.07	8	7.819	0.365	0.688	S
H1	Cu µg/l	1.284	1.3	1.278	0.113	0.055	S
H2		1.008	1	0.987	0.088	0.234	S
H3		8.757	9	8.657	0.395	0.253	S
H4		7.769	8	7.764	0.3	0.017	S
H1	Ni µg/l	< 2.000	1.2	1.141	0.117		B
H2		< 2.000	0.9	0.872	0.089		B
H3		10.15	10	9.795	0.657	0.54	S
H4		10.964	11	10.726	0.588	0.405	S
H1	Pb µg/l	< 1.000	0.8	0.756	0.06		B
H2		1.05	1.1	1.034	0.083	0.195	S
H3		24.519	25.5	24.811	1.314	-0.222	S
H4		25.86	27	26.083	1.52	-0.146	S
H1	Zn µg/l	12.121	12	12.065	1.301	0.043	S
H2		9.309	9	9.088	1.789	0.123	S
H3		116.711	115	114.681	8.25	0.246	S
H4		126.02	122	120.844	8.84	0.586	S

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PO Box 100
NO-2027 KJELLER, Norway
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NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
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* Z score in unitless

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S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 194, Institute of Public Health - Zrenjanin (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
H1	As µg/l	< 5.000	0.9	0.873	0.157		B
H2		< 5.000	0.7	0.712	0.057		B
H3		7.3	8	7.968	0.706	-0.946	S
H4		10.1	10.5	10.572	1.021	-0.463	S
H1	Cd µg/l	< 0.500	0.09	0.087	0.011		B
H2		< 0.500	0.1	0.096	0.008		B
H3		1.49	1.5	1.486	0.09	0.05	S
H4		1.34	1.3	1.279	0.081	0.751	S
H1	Cr µg/l	1.1	1.1	1.042	0.109	0.534	S
H2		0.65	0.7	0.671	0.056	-0.376	S
H3		6.95	7	6.799	0.349	0.432	S
H4		7.9	8	7.819	0.365	0.222	S
H1	Cu µg/l	< 5.000	1.3	1.278	0.113		B
H2		< 5.000	1	0.987	0.088		B
H3		9	9	8.657	0.395	0.868	S
H4		7.7	8	7.764	0.3	-0.213	S
H1	Ni µg/l	< 5.000	1.2	1.141	0.117		B
H2		< 5.000	0.9	0.872	0.089		B
H3		9.9	10	9.795	0.657	0.159	S
H4		10.8	11	10.726	0.588	0.127	S
H1	Pb µg/l	< 2.000	0.8	0.756	0.06		B
H2		< 2.000	1.1	1.034	0.083		B
H3		25.2	25.5	24.811	1.314	0.296	S
H4		26.6	27	26.083	1.52	0.34	S
H1	Zn µg/l	11.4	12	12.065	1.301	-0.511	S
H2		8.5	9	9.088	1.789	-0.329	S
H3		112.9	115	114.681	8.25	-0.216	S
H4		118.8	122	120.844	8.84	-0.231	S

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PO Box 100
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Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 196, Institute of Public Health Leskovac (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As <i>µg/l</i>	-999	0.9	0.873	0.157		B
H2		-999	0.7	0.712	0.057		B
H3		-999	8	7.968	0.706		B
H4		-999	10.5	10.572	1.021		B
H1	Cd <i>µg/l</i>	-999	0.09	0.087	0.011		B
H2		-999	0.1	0.096	0.008		B
H3		-999	1.5	1.486	0.09		B
H4		-999	1.3	1.279	0.081		B
H1	Cr <i>µg/l</i>	-999	1.1	1.042	0.109		B
H2		-999	0.7	0.671	0.056		B
H3		-999	7	6.799	0.349		B
H4		-999	8	7.819	0.365		B
H1	Cu <i>µg/l</i>	-999	1.3	1.278	0.113		B
H2		-999	1	0.987	0.088		B
H3		-999	9	8.657	0.395		B
H4		-999	8	7.764	0.3		B
H1	Ni <i>µg/l</i>	-999	1.2	1.141	0.117		B
H2		-999	0.9	0.872	0.089		B
H3		-999	10	9.795	0.657		B
H4		-999	11	10.726	0.588		B
H1	Pb <i>µg/l</i>	-999	0.8	0.756	0.06		B
H2		-999	1.1	1.034	0.083		B
H3		25.56	25.5	24.811	1.314	0.57	S
H4		26.7	27	26.083	1.52	0.406	S
H1	Zn <i>µg/l</i>	-999	12	12.065	1.301		B
H2		-999	9	9.088	1.789		B
H3		118.7	115	114.681	8.25	0.487	S
H4		126.24	122	120.844	8.84	0.61	S

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PO Box 100
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NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
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Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 198, Institute for public health - Sremska Mitrovica (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As <i>µg/l</i>	< 1.000	0.9	0.873	0.157		B
H2		< 1.000	0.7	0.712	0.057		B
H3		7.67	8	7.968	0.706	-0.422	S
H4		10.11	10.5	10.572	1.021	-0.453	S
H1	Cd <i>µg/l</i>	-999	0.09	0.087	0.011		B
H2		-999	0.1	0.096	0.008		B
H3		-999	1.5	1.486	0.09		B
H4		-999	1.3	1.279	0.081		B
H1	Cr <i>µg/l</i>	-999	1.1	1.042	0.109		B
H2		-999	0.7	0.671	0.056		B
H3		-999	7	6.799	0.349		B
H4		-999	8	7.819	0.365		B
H1	Cu <i>µg/l</i>	-999	1.3	1.278	0.113		B
H2		-999	1	0.987	0.088		B
H3		-999	9	8.657	0.395		B
H4		-999	8	7.764	0.3		B
H1	Ni <i>µg/l</i>	-999	1.2	1.141	0.117		B
H2		-999	0.9	0.872	0.089		B
H3		-999	10	9.795	0.657		B
H4		-999	11	10.726	0.588		B
H1	Pb <i>µg/l</i>	-999	0.8	0.756	0.06		B
H2		-999	1.1	1.034	0.083		B
H3		-999	25.5	24.811	1.314		B
H4		-999	27	26.083	1.52		B
H1	Zn <i>µg/l</i>	< 22.000	12	12.065	1.301		B
H2		< 22.000	9	9.088	1.789		B
H3		112.7	115	114.681	8.25	-0.24	S
H4		117.7	122	120.844	8.84	-0.356	S

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PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
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* Z score in unitless

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Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 203, The Public Health Institute Vranje (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As $\mu\text{g/l}$	-999	0.9	0.873	0.157		B
H2		-999	0.7	0.712	0.057		B
H3		-999	8	7.968	0.706		B
H4		-999	10.5	10.572	1.021		B
H1	Cd $\mu\text{g/l}$	< 0.500	0.09	0.087	0.011		B
H2		< 0.500	0.1	0.096	0.008		B
H3		1.54	1.5	1.486	0.09	0.608	S
H4		1.28	1.3	1.279	0.081	0.006	S
H1	Cr $\mu\text{g/l}$	< 2.000	1.1	1.042	0.109		B
H2		< 2.000	0.7	0.671	0.056		B
H3		6.88	7	6.799	0.349	0.231	S
H4		7.87	8	7.819	0.365	0.14	S
H1	Cu $\mu\text{g/l}$	< 2.000	1.3	1.278	0.113		B
H2		< 2.000	1	0.987	0.088		B
H3		8.42	9	8.657	0.395	-0.599	S
H4		7.47	8	7.764	0.3	-0.981	S
H1	Ni $\mu\text{g/l}$	< 2.000	1.2	1.141	0.117		B
H2		< 2.000	0.9	0.872	0.089		B
H3		10.72	10	9.795	0.657	1.407	S
H4		11.63	11	10.726	0.588	1.538	S
H1	Pb $\mu\text{g/l}$	< 1.000	0.8	0.756	0.06		B
H2		1.1	1.1	1.034	0.083	0.796	S
H3		24.32	25.5	24.811	1.314	-0.374	S
H4		26.24	27	26.083	1.52	0.104	S
H1	Zn $\mu\text{g/l}$	< 20.000	12	12.065	1.301		B
H2		< 20.000	9	9.088	1.789		B
H3		112.2	115	114.681	8.25	-0.301	S
H4		123.4	122	120.844	8.84	0.289	S

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NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
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NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
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Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

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* Z score in unitless

☒ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 204, Institute for Public Health "Pomoravlje" Cuprija (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As $\mu\text{g/l}$	-999	0.9	0.873	0.157		B
H2		-999	0.7	0.712	0.057		B
H3		-999	8	7.968	0.706		B
H4		-999	10.5	10.572	1.021		B
H1	Cd $\mu\text{g/l}$	< 1.000	0.09	0.087	0.011		B
H2		< 1.000	0.1	0.096	0.008		B
H3		1.13	1.5	1.486	0.09	-3.968	Q
H4		1	1.3	1.279	0.081	-3.467	Q
H1	Cr $\mu\text{g/l}$	-999	1.1	1.042	0.109		B
H2		-999	0.7	0.671	0.056		B
H3		-999	7	6.799	0.349		B
H4		-999	8	7.819	0.365		B
H1	Cu $\mu\text{g/l}$	-999	1.3	1.278	0.113		B
H2		-999	1	0.987	0.088		B
H3		-999	9	8.657	0.395		B
H4		-999	8	7.764	0.3		B
H1	Ni $\mu\text{g/l}$	1.3	1.2	1.141	0.117	1.362	S
H2		2	0.9	0.872	0.089	12.731	U
H3		11.7	10	9.795	0.657	2.898	Q
H4		11.5	11	10.726	0.588	1.317	S
H1	Pb $\mu\text{g/l}$	< 10.000	0.8	0.756	0.06		B
H2		< 10.000	1.1	1.034	0.083		B
H3		25.8	25.5	24.811	1.314	0.752	S
H4		25.3	27	26.083	1.52	-0.515	S
H1	Zn $\mu\text{g/l}$	15	12	12.065	1.301	2.256	Q
H2		10	9	9.088	1.789	0.51	S
H3		120	115	114.681	8.25	0.645	S
H4		115	122	120.844	8.84	-0.661	S

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NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
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EMEP – Analytical intercomparison of heavy metals in precipitation 2017

Laboratory 205, Department of Gossiences and Natural Resource Management, University of Copenhagen (Denmark)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
H1	As µg/l	0.96	0.9	0.873	0.157	0.555	S
H2		0.76	0.7	0.712	0.057	0.841	S
H3		8.1	8	7.968	0.706	0.187	S
H4		10.48	10.5	10.572	1.021	-0.09	S
H1	Cd µg/l	0.096	0.09	0.087	0.011	0.83	S
H2		0.11	0.1	0.096	0.008	1.846	S
H3		1.54	1.5	1.486	0.09	0.608	S
H4		1.33	1.3	1.279	0.081	0.627	S
H1	Cr µg/l	1.09	1.1	1.042	0.109	0.442	S
H2		0.7	0.7	0.671	0.056	0.51	S
H3		6.88	7	6.799	0.349	0.231	S
H4		7.69	8	7.819	0.365	-0.353	S
H1	Cu µg/l	1.24	1.3	1.278	0.113	-0.334	S
H2		0.94	1	0.987	0.088	-0.535	S
H3		9.03	9	8.657	0.395	0.944	S
H4		7.98	8	7.764	0.3	0.721	S
H1	Ni µg/l	1.28	1.2	1.141	0.117	1.191	S
H2		0.98	0.9	0.872	0.089	1.215	S
H3		10.24	10	9.795	0.657	0.677	S
H4		11.04	11	10.726	0.588	0.535	S
H1	Pb µg/l	0.7	0.8	0.756	0.06	-0.927	S
H2		0.97	1.1	1.034	0.083	-0.766	S
H3		23.52	25.5	24.811	1.314	-0.982	S
H4		24.87	27	26.083	1.52	-0.798	S
H1	Zn µg/l	15.24	12	12.065	1.301	2.441	Q
H2		11.92	9	9.088	1.789	1.583	Q
H3		127.7	115	114.681	8.25	1.578	S
H4		133.77	122	120.844	8.84	1.462	S

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PO Box 100
NO-2027 KJELLER, Norway
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NILU – Norsk institutt for luftforskning
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Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
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