

litteR - Analysis of Litter Data

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Introduction

This tool performs the following types of data analysis on beach litter data, or any other type of litter data: data quality control, outlier analysis, descriptive statistics, and trend analysis.

This report can best be viewed with the latest versions of web browsers like Google Chrome, Mozilla Firefox, Chromium, or Safari. Its contents does not render well in some versions of Microsoft's Internet Explorer.

Settings

- period: from 2016-01-01 to 2021-12-31
- percentage of total count to analyse: 100%
- files:
 - project directory: 'C:/Users/evbl/Desktop/IB2024_VH'
 - settings: 'settings_VH.yaml'
 - data: 'Data_file.csv'
 - types: 'Category_file.csv'
- location codes: 'Edsvik SE5', 'Angklavebukten - Salto - SE6', 'Haby SE4', 'Groderhamnsvik SE9', 'Barrevik SE8', 'Gronevik Overon SE7', 'Jaravallen' and 'Sudde strand'
- region codes: 'VH'
- group codes: 'PLAST', 'TYG', 'METALL', 'PAPPER.KARTONG', 'GUMMI', 'TRA', 'GLAS.KERAMIK', 'SANITET.MEDICINSKT', 'ORGANISKT', 'KEMISKA.FORORENINGAR', 'OLIKA.MATERIAL', 'SUP' and 'FISH'
- type names: not specified
- figure quality: 'high'
- cutoff count axis in plots: 100%

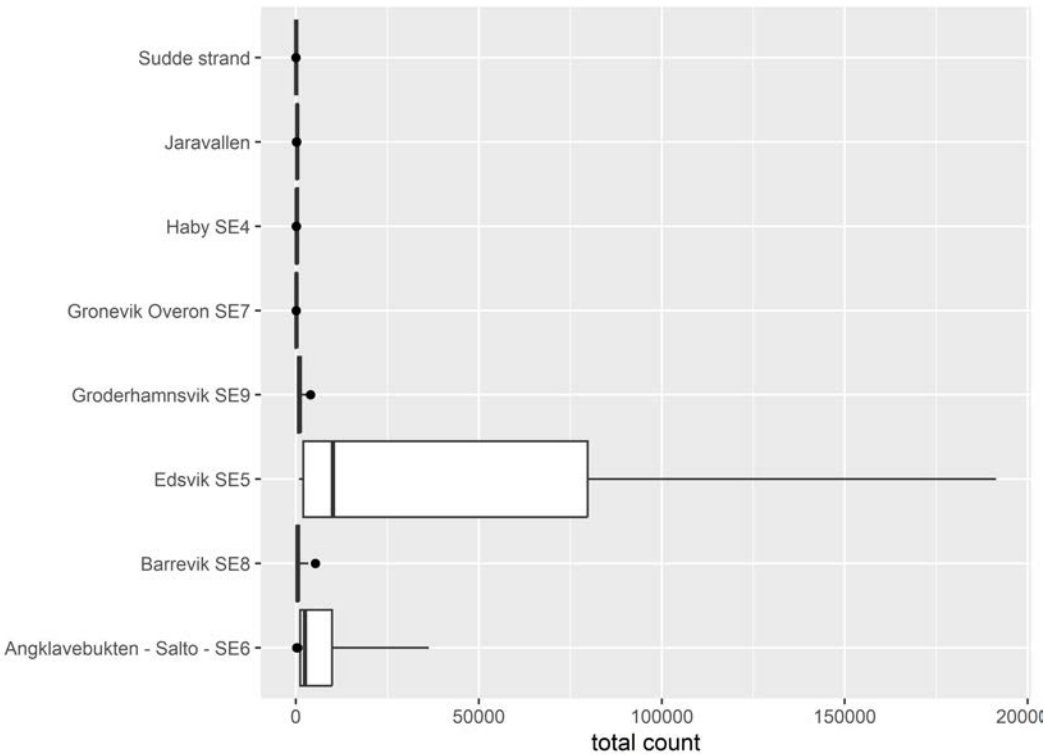
Data Quality Control

In this section, litter data will be read and validated. Warnings will be printed if they occur. See also the log-file for more details.

Warning: The following columns will be excluded from analysis:
'kat_108', 'kat_109', 'kat_110', 'kat_111', 'kat_117', 'kat_ot01', 'kat_1171' and 'kat_1172'

Outlier analysis

For each `location_code` , adjusted boxplots (<https://dx.doi.org/doi:10.1016/j.csda.2007.11.008>) are given of the total count for outliers (<https://en.wikipedia.org/wiki/Outlier>) detection in the period 2016-01-01 to 2021-12-31. Outliers are given as dots (if any) in the adjusted box-and-whisker plots below. Note that outliers are not necessarily errors.



Outliers, if available, are listed in the table below. In addition, also the number of surveys `n` is reported. Litter experts should decide if outliers are errors and need to be excluded from analysis. Note, however, that due to its non-parametric nature, `litteR` is fairly robust for outliers.

location_code	date	n	total count
Angklavebukten - Salto - SE6	2021-07-06	18	149
Angklavebukten - Salto - SE6	2021-09-30	18	456
Barrevik SE8	2020-04-22	18	5272
Groderhamnsvik SE9	2018-04-22	18	3982
Gronevik Overon SE7	2021-07-01	17	24
Haby SE4	2017-07-05	18	9
Haby SE4	2019-06-25	18	40
Haby SE4	2016-07-14	18	57
Haby SE4	2017-10-09	18	74
Jaravallen	2016-11-05	18	86
Jaravallen	2016-07-18	18	141

location_code	date	n	total count
Jaravallen	2018-04-22	18	151
Sudde strand	2017-05-03	18	1

Descriptive statistics

Basic statistics

The number of years and the number of surveys for each `location_code` should not be too small, otherwise the calculations in this report will be less reliable. In addition, the surveys should ideally also be evenly spread in time.

Note that **litteR** does not enforce a minimum number of years or surveys. That is the responsibility of the user. As a guideline, we advise a minimum of 5 years and 10 surveys, evenly distributed in time.

The table below gives the number of surveys and the number of years for each `location_code` .

region_code	location_code	number of years	number of surveys
VH	Angklavebukten - Salto - SE6	6	18
VH	Barrevik SE8	6	18
VH	Edsvik SE5	6	18
VH	Groderhamnsvik SE9	6	18
VH	Gronevik Overon SE7	6	17
VH	Haby SE4	6	18
VH	Jaravallen	6	18
VH	Sudde strand	6	18

For each location code and group/type name, the following statistics have been estimated for the period 2016-01-01 to 2021-12-31:

- mean count (`mean`), *i.e.*, the arithmetic mean (https://en.wikipedia.org/wiki/Arithmetic_mean) of the counts for each litter type;
- median count (`median`), *i.e.*, the median (<https://en.wikipedia.org/wiki/Median>) of the counts for each litter type;
- relative count (`%TC`): the contribution of each litter type to the total count of litter types (%);
- coefficient of variation (https://en.wikipedia.org/wiki/Coefficient_of_variation) (`cv`): the ratio of the standard deviation to the mean of the counts for each litter type (expressed as a fraction);
- ratio of mad (https://en.wikipedia.org/wiki/Median_absolute_deviation) and median (<https://en.wikipedia.org/wiki/Median>) (`rmad` , expressed as a fraction);
- number of surveys (`n`);
- Theil-Sen slope (https://en.wikipedia.org/wiki/Theil%E2%80%93Sen_estimator) (slope): a robust non-parametric estimator of slope (litter counts / year);

- p-value (<https://en.wikipedia.org/wiki/P-value>): the p-value associated with the one-tailed Mann-Kendall test (https://en.wikipedia.org/wiki/Kendall_rank_correlation_coefficient) to test the null hypothesis of
 - no monotonically *increasing* trend in case the Theil-Sen slope is greater than zero;
 - no monotonically *decreasing* trend in case the Theil-Sen slope is smaller than zero;

These statistics will be estimated for litter types with the greatest counts making up 100% of the total count for each location and for all groups specified in ‘Category_file.csv’.

These statistics have been stored in file ‘litteR-results-20230328T153019.csv’.

The statistics for the litter groups are given in the table below. These group statistics are based on *all* litter types and not only on those types with the highest counts.

location_code	from	to	group_code	%TC	mean	median	cv	rmad	n	slope	p-value
Angklavebukten - Salto - SE6	2016-04-15	2021-09-30	TC	100	7766	2424	1.396	1.084	18	-266.1	0.1843
Angklavebukten - Salto - SE6	2016-04-15	2021-09-30	PLAST	86.77	6763	2057	1.412	1.066	18	-246.5	0.1467
Angklavebukten - Salto - SE6	2016-04-15	2021-09-30	SUP	25.26	1774	568	1.586	0.9827	18	-53.8	0.2271
Angklavebukten - Salto - SE6	2016-04-15	2021-09-30	FISH	21.89	2082	656	1.601	1.218	18	-117.6	0.2051
Angklavebukten - Salto - SE6	2016-04-15	2021-09-30	SANITET.MEDICINSKT	8.369	736.1	288.5	1.437	1.197	18	-18.45	0.2504
Angklavebukten - Salto - SE6	2016-04-15	2021-09-30	GUMMI	2.537	158.2	44	1.5	1.078	18	-9.23	0.0655
Angklavebukten - Salto - SE6	2016-04-15	2021-09-30	TRA	1.191	60.72	29.5	1.789	1.005	18	-4.483	0.1443
Angklavebukten - Salto - SE6	2016-04-15	2021-09-30	PAPPER.KARTONG	0.4802	23.17	5	2.074	0.8896	18	-0.4526	0.1488
Angklavebukten - Salto - SE6	2016-04-15	2021-09-30	METALL	0.2644	10.28	7	1.048	1.059	18	-0.3162	0.3238
Angklavebukten - Salto - SE6	2016-04-15	2021-09-30	GLAS.KERAMIK	0.2284	11.11	3.5	1.782	1.059	18	0	0.5906
Angklavebukten - Salto - SE6	2016-04-15	2021-09-30	TYG	0.1607	3.889	2.5	1.039	1.483	18	-0.6623	0.0417
Angklavebukten - Salto - SE6	2016-04-15	2021-09-30	OLIKA.MATERIAL	0	0	0	NA	NA	18	0	NA
Angklavebukten - Salto - SE6	2016-04-15	2021-09-30	ORGANISKT	0	0	0	NA	NA	18	0	NA
Barrevik SE8	2016-04-12	2021-10-14	TC	100	749.8	414.5	1.598	1.111	18	75.53	0.1004
Barrevik SE8	2016-04-12	2021-10-14	PLAST	95.6	730.7	367.5	1.627	1.138	18	76.32	0.0876

location_code	from	to	group_code	%TC	mean	median	cv	rmad	n	slope	p-value
Barrevik SE8	2016-04-12	2021-10-14	FISH	46.7	501.7	143	2.005	1.405	18	56.4	0.0069
Barrevik SE8	2016-04-12	2021-10-14	SUP	12.16	48.06	33	1.008	0.921	18	4.583	0.1648
Barrevik SE8	2016-04-12	2021-10-14	METALL	1.144	4.222	1	1.934	1.483	18	0	0.6077
Barrevik SE8	2016-04-12	2021-10-14	PAPPER.KARTONG	0.9089	1.778	0	2.047	NA	18	0	0.4002
Barrevik SE8	2016-04-12	2021-10-14	GUMMI	0.8055	2.889	1.5	1.394	1.483	18	0	0.8270
Barrevik SE8	2016-04-12	2021-10-14	TRA	0.6834	3.833	2.5	1.25	1.483	18	0	0.7950
Barrevik SE8	2016-04-12	2021-10-14	GLAS.KERAMIK	0.562	3.667	1	1.953	1.483	18	0	0.7371
Barrevik SE8	2016-04-12	2021-10-14	SANITET.MEDICINSKT	0.1832	1.944	0	1.522	NA	18	0	0.9301
Barrevik SE8	2016-04-12	2021-10-14	TYG	0.1161	0.7222	0	2.004	NA	18	0	0.4301
Barrevik SE8	2016-04-12	2021-10-14	OLIKA.MATERIAL	0	0	0	NA	NA	18	0	NA
Barrevik SE8	2016-04-12	2021-10-14	ORGANISKT	0	0	0	NA	NA	18	0	NA
Edsvik SE5	2016-04-01	2021-09-29	TC	100	44076	10098	1.381	1.314	18	-281.8	0.3270
Edsvik SE5	2016-04-01	2021-09-29	PLAST	97.03	43236	9921	1.384	1.324	18	-265.2	0.3005
Edsvik SE5	2016-04-01	2021-09-29	FISH	62.05	34197	6823	1.494	1.39	18	-93.18	0.4703
Edsvik SE5	2016-04-01	2021-09-29	SUP	7.762	2020	565	1.367	1.275	18	-66.52	0.1004
Edsvik SE5	2016-04-01	2021-09-29	SANITET.MEDICINSKT	1.323	384.4	75.5	1.49	1.463	18	-23.76	0.0749
Edsvik SE5	2016-04-01	2021-09-29	GUMMI	1.074	377.3	90	1.719	1.376	18	-13.07	0.1145
Edsvik SE5	2016-04-01	2021-09-29	GLAS.KERAMIK	0.2141	15.94	7.5	1.307	1.483	18	-0.416	0.2696
Edsvik SE5	2016-04-01	2021-09-29	TRA	0.2083	39.39	9	1.713	1.153	18	-2.008	0.1353
Edsvik SE5	2016-04-01	2021-09-29	PAPPER.KARTONG	0.0897	10.28	1.5	2.557	1.483	18	0	0.3065
Edsvik SE5	2016-04-01	2021-09-29	METALL	0.04318	9.889	2	1.813	1.112	18	-0.6265	0.0248

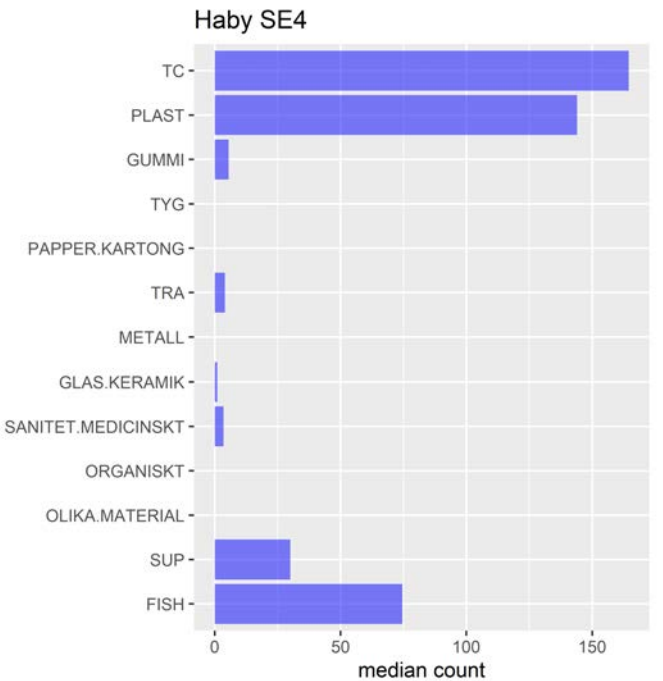
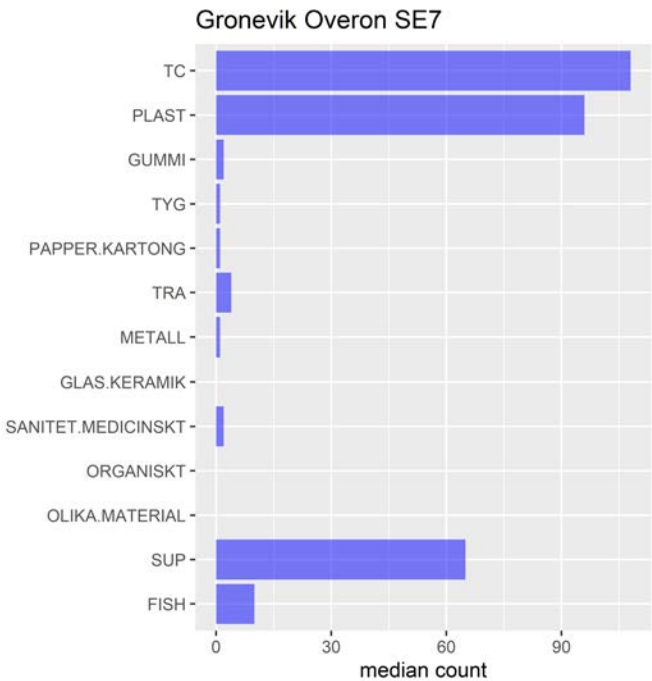
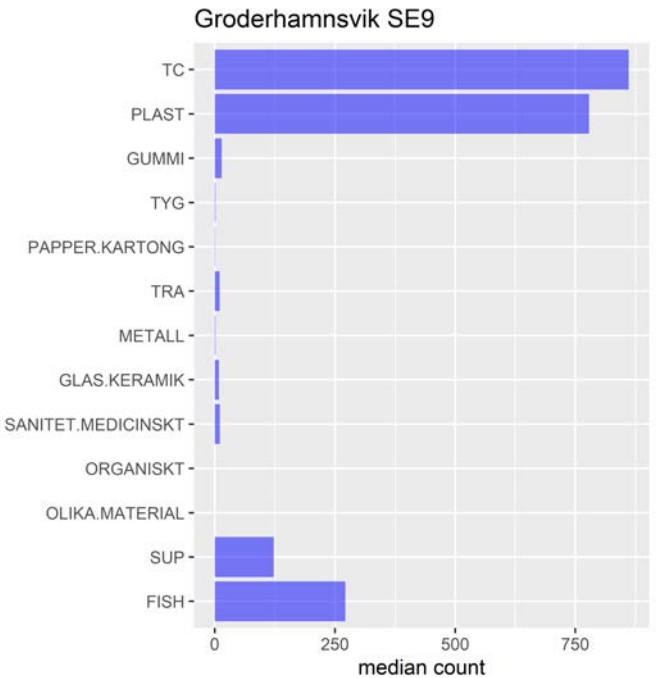
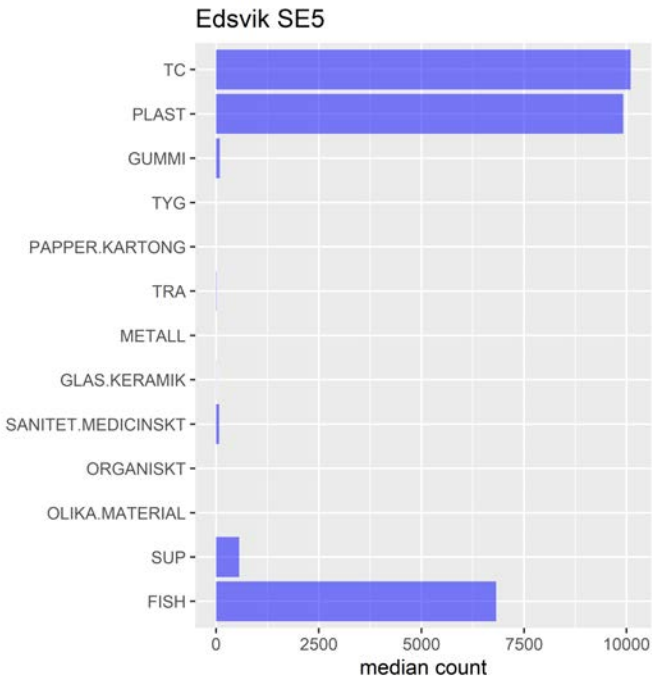
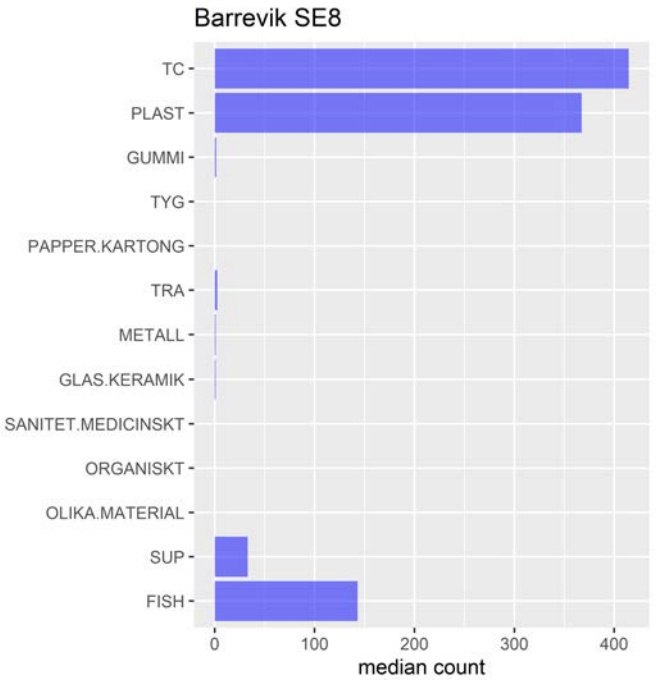
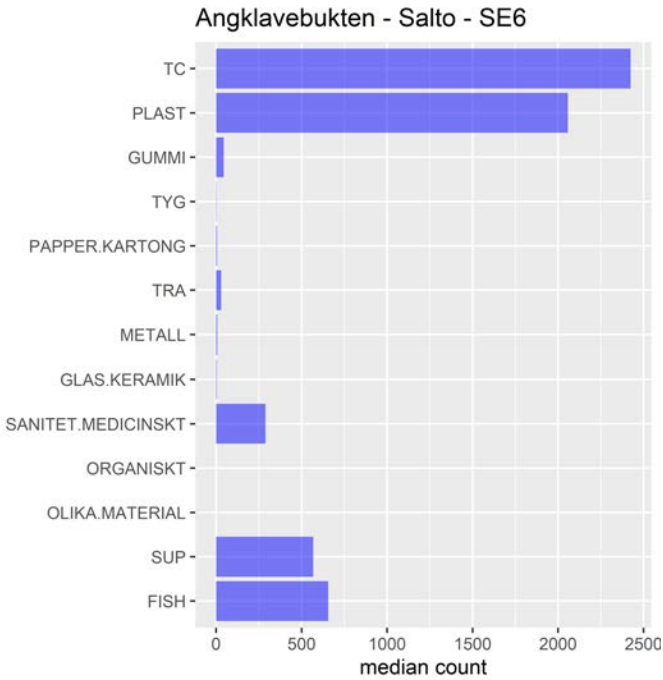
location_code	from	to	group_code	%TC	mean	median	cv	rmad	n	slope	p-value
Edsvik SE5	2016-04-01	2021-09-29	TYG	0.02082	2.833	1	2.452	1.483	18	-0.1985	0.0546
Edsvik SE5	2016-04-01	2021-09-29	OLIKA.MATERIAL	0	0	0	NA	NA	18	0	NA
Edsvik SE5	2016-04-01	2021-09-29	ORGANISKT	0	0	0	NA	NA	18	0	NA
Groderhamnsvik SE9	2016-04-23	2021-09-21	TC	100	1125	861	0.8151	0.7714	18	-217.7	0.0054
Groderhamnsvik SE9	2016-04-23	2021-09-21	PLAST	93	1049	778.5	0.8169	0.7789	18	-194.1	0.0069
Groderhamnsvik SE9	2016-04-23	2021-09-21	FISH	35.64	428.3	271.5	1.075	0.7181	18	-83.36	0.0086
Groderhamnsvik SE9	2016-04-23	2021-09-21	SUP	14.67	151.9	122.5	0.7684	0.4418	18	-18.46	0.0479
Groderhamnsvik SE9	2016-04-23	2021-09-21	GLAS.KERAMIK	1.744	17.06	8.5	1.092	1.483	18	-4.24	0.0588
Groderhamnsvik SE9	2016-04-23	2021-09-21	GUMMI	1.716	21.28	14.5	1.037	1.329	18	-3.979	0.0040
Groderhamnsvik SE9	2016-04-23	2021-09-21	TRA	1.69	18.33	10	1.013	0.7413	18	-1.455	0.0852
Groderhamnsvik SE9	2016-04-23	2021-09-21	SANITET.MEDICINSKT	1.348	13.17	10.5	1.027	0.6354	18	-1.648	0.0340
Groderhamnsvik SE9	2016-04-23	2021-09-21	METALL	0.267	2.278	1.5	1.184	0.9884	18	0	0.7579
Groderhamnsvik SE9	2016-04-23	2021-09-21	TYG	0.1298	1.833	1.5	1.259	1.483	18	0	0.0626
Groderhamnsvik SE9	2016-04-23	2021-09-21	PAPPER.KARTONG	0.1034	1.611	1	1.566	1.483	18	0	0.0675
Groderhamnsvik SE9	2016-04-23	2021-09-21	OLIKA.MATERIAL	0	0	0	NA	NA	18	0	NA
Groderhamnsvik SE9	2016-04-23	2021-09-21	ORGANISKT	0	0	0	NA	NA	18	0	NA
Gronevik Overon SE7	2016-04-15	2021-10-01	TC	100	133.4	108	0.6744	0.6589	17	-16.18	0.0539
Gronevik Overon SE7	2016-04-15	2021-10-01	PLAST	87	116.5	96	0.6745	0.7104	17	-14.28	0.0644
Gronevik Overon SE7	2016-04-15	2021-10-01	SUP	53	71.88	65	0.6982	0.6843	17	-8.576	0.0687
Gronevik Overon SE7	2016-04-15	2021-10-01	FISH	11.65	16.06	10	0.7386	1.038	17	-3.078	0.0117
Gronevik Overon SE7	2016-04-15	2021-10-01	TRA	4.379	5.235	4	1.09	1.483	17	-0.5674	0.1447

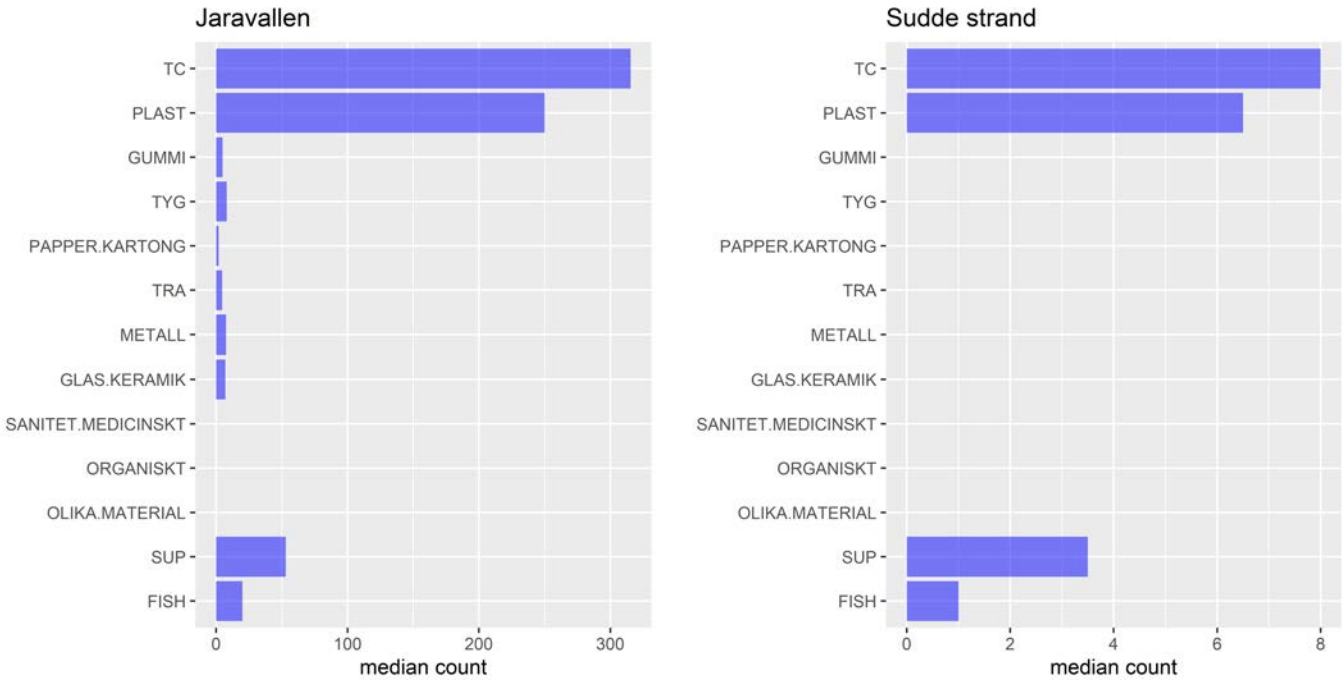
location_code	from	to	group_code	%TC	mean	median	cv	rmad	n	slope	p-value
Gronevik Overon SE7	2016-04-15	2021-10-01	GUMMI	2.41	3.706	2	1.136	1.483	17	0	0.3374
Gronevik Overon SE7	2016-04-15	2021-10-01	SANITET.MEDICINSKT	1.859	3.118	2	1.429	1.483	17	0	0.3657
Gronevik Overon SE7	2016-04-15	2021-10-01	PAPPER.KARTONG	1.378	1.176	1	1.093	1.483	17	0	0.7136
Gronevik Overon SE7	2016-04-15	2021-10-01	METALL	1.19	1.118	1	1.044	1.483	17	0	0.7140
Gronevik Overon SE7	2016-04-15	2021-10-01	TYG	1.031	1.294	1	0.9761	1.483	17	-0.331	0.0065
Gronevik Overon SE7	2016-04-15	2021-10-01	GLAS.KERAMIK	0.7502	1.176	0	1.385	NA	17	0	0.3593
Gronevik Overon SE7	2016-04-15	2021-10-01	OLIKA.MATERIAL	0	0	0	NA	NA	17	0	NA
Gronevik Overon SE7	2016-04-15	2021-10-01	ORGANISKT	0	0	0	NA	NA	17	0	NA
Haby SE4	2016-04-05	2021-09-20	TC	100	355.1	164.5	1.023	1.045	18	138.3	0.0002
Haby SE4	2016-04-05	2021-09-20	PLAST	92.4	328.6	144	1.033	0.9987	18	124	0.0003
Haby SE4	2016-04-05	2021-09-20	FISH	44.21	173.3	74.5	1.358	1.055	18	43.72	0.0006
Haby SE4	2016-04-05	2021-09-20	SUP	15.82	41	30	0.9151	0.7907	18	10.74	0.0014
Haby SE4	2016-04-05	2021-09-20	GUMMI	2.566	7.444	5.5	0.909	1.078	18	2.483	0.0008
Haby SE4	2016-04-05	2021-09-20	TRA	1.79	5.333	4	1.207	1.297	18	1.345	0.0084
Haby SE4	2016-04-05	2021-09-20	SANITET.MEDICINSKT	1.451	5.222	3.5	1.1	1.483	18	1.622	0.0032
Haby SE4	2016-04-05	2021-09-20	GLAS.KERAMIK	1.024	6.667	1	2.511	1.483	18	0.9952	0.0127
Haby SE4	2016-04-05	2021-09-20	TYG	0.3612	0.8889	0	1.489	NA	18	0	0.6937
Haby SE4	2016-04-05	2021-09-20	METALL	0.2387	0.6111	0	1.697	NA	18	0	0.9341
Haby SE4	2016-04-05	2021-09-20	PAPPER.KARTONG	0.1722	0.3333	0	2.91	NA	18	0	0.9742
Haby SE4	2016-04-05	2021-09-20	OLIKA.MATERIAL	0	0	0	NA	NA	18	0	NA
Haby SE4	2016-04-05	2021-09-20	ORGANISKT	0	0	0	NA	NA	18	0	NA

location_code	from	to	group_code	%TC	mean	median	cv	rmad	n	slope	p-value
Jaravallen	2016-04-24	2021-11-12	TC	100	390.9	315.5	0.6292	0.4511	18	37.65	0.1300
Jaravallen	2016-04-24	2021-11-12	PLAST	80.8	333.1	250	0.6998	0.5545	18	32.81	0.1004
Jaravallen	2016-04-24	2021-11-12	SUP	17.83	56.67	53	0.5852	0.4056	18	3.308	0.2475
Jaravallen	2016-04-24	2021-11-12	FISH	7.89	27	20	0.7427	0.5189	18	1.543	0.2239
Jaravallen	2016-04-24	2021-11-12	PAPPER.KARTONG	5.188	13.06	2	1.594	1.483	18	-0.4395	0.0946
Jaravallen	2016-04-24	2021-11-12	TYG	3.818	10.83	8	1.11	1.112	18	1.23	0.1431
Jaravallen	2016-04-24	2021-11-12	TRA	3.49	8.944	4.5	1.655	1.483	18	-0.7204	0.1878
Jaravallen	2016-04-24	2021-11-12	METALL	2.852	11.06	7.5	1.224	0.6919	18	0.6647	0.1265
Jaravallen	2016-04-24	2021-11-12	GLAS.KERAMIK	2.2	8.778	7	0.705	1.059	18	0.5628	0.2344
Jaravallen	2016-04-24	2021-11-12	GUMMI	1.51	4.556	5	0.9073	0.8896	18	1.089	0.0285
Jaravallen	2016-04-24	2021-11-12	SANITET.MEDICINSKT	0.2633	1.056	0	1.764	NA	18	0	0.8334
Jaravallen	2016-04-24	2021-11-12	ORGANISKT	0.08274	0.2778	0	2.975	NA	18	0	0.7796
Jaravallen	2016-04-24	2021-11-12	OLIKA.MATERIAL	0.06441	0.3889	0	3.651	NA	18	0	0.5832
Sudde strand	2016-05-10	2021-11-06	TC	100	28.94	8	1.673	1.112	18	5.437	0.0114
Sudde strand	2016-05-10	2021-11-06	PLAST	74.15	24.78	6.5	1.806	1.14	18	4.035	0.0125
Sudde strand	2016-05-10	2021-11-06	SUP	35.1	8.889	3.5	1.395	1.483	18	1.08	0.0837
Sudde strand	2016-05-10	2021-11-06	FISH	10.65	3.667	1	1.864	1.483	18	0.6714	0.0002
Sudde strand	2016-05-10	2021-11-06	PAPPER.KARTONG	9.978	0.6111	0	1.5	NA	18	0	0.9473
Sudde strand	2016-05-10	2021-11-06	METALL	4.277	0.6111	0	1.697	NA	18	0	0.9529
Sudde strand	2016-05-10	2021-11-06	TYG	3.197	0.2778	0	1.659	NA	18	0	0.7061
Sudde strand	2016-05-10	2021-11-06	TRA	2.763	0.9444	0	1.938	NA	18	0	0.9592

location_code	from	to	group_code	%TC	mean	median	cv	rmad	n	slope	p-value
Sudde strand	2016-05-10	2021-11-06	GUMMI	2.399	0.7222	0	2.114	NA	18	0	0.9398
Sudde strand	2016-05-10	2021-11-06	GLAS.KERAMIK	1.191	0.3889	0	2.666	NA	18	0	0.8804
Sudde strand	2016-05-10	2021-11-06	OLIKA.MATERIAL	1.114	0.5556	0	1.659	NA	18	0	0.9954
Sudde strand	2016-05-10	2021-11-06	ORGANISKT	0.9259	0.05556	0	4.243	NA	18	0	0.3862
Sudde strand	2016-05-10	2021-11-06	SANITET.MEDICINSKT	0.3168	0.3333	0	3.565	NA	18	0	0.9465

The figures below show for each location code the median count for each group.





Top 10

The table below gives for each location the top 10 of litter types, *i.e.*, the 10 litter types with the highest median litter counts.

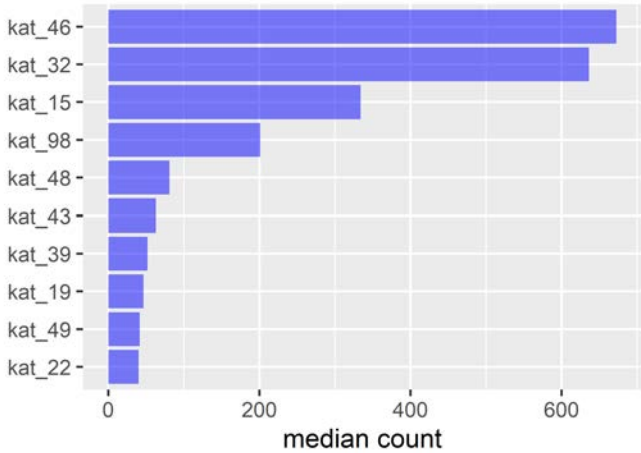
location_code	rank	type_name	median count
Angklavebukten - Salto - SE6	1	kat_46	672.5
Angklavebukten - Salto - SE6	2	kat_32	636.5
Angklavebukten - Salto - SE6	3	kat_15	334.0
Angklavebukten - Salto - SE6	4	kat_98	201.0
Angklavebukten - Salto - SE6	5	kat_48	81.0
Angklavebukten - Salto - SE6	6	kat_43	63.0
Angklavebukten - Salto - SE6	7	kat_39	52.0
Angklavebukten - Salto - SE6	8	kat_19	46.5
Angklavebukten - Salto - SE6	9	kat_49	41.5
Angklavebukten - Salto - SE6	10	kat_22	40.0
Barrevik SE8	1	kat_32	99.0
Barrevik SE8	2	kat_46	80.0
Barrevik SE8	3	kat_19	11.0
Barrevik SE8	4	kat_39	5.5
Barrevik SE8	5	kat_15	5.0
Barrevik SE8	6	kat_31	5.0
Barrevik SE8	7	kat_2	2.0
Barrevik SE8	8	kat_3	2.0
Barrevik SE8	9	kat_4	2.0

location_code	rank	type_name	median count
Barrevik SE8	10	kat_115	1.5
Edsvik SE5	1	kat_32	4071.0
Edsvik SE5	2	kat_46	1331.0
Edsvik SE5	3	kat_15	255.0
Edsvik SE5	4	kat_49	90.0
Edsvik SE5	5	kat_39	70.5
Edsvik SE5	6	kat_98	68.0
Edsvik SE5	7	kat_48	56.5
Edsvik SE5	8	kat_19	52.0
Edsvik SE5	9	kat_43	33.5
Edsvik SE5	10	kat_3	29.0
Groderhamnsvik SE9	1	kat_46	352.5
Groderhamnsvik SE9	2	kat_32	248.5
Groderhamnsvik SE9	3	kat_19	32.5
Groderhamnsvik SE9	4	kat_15	27.5
Groderhamnsvik SE9	5	kat_49	13.0
Groderhamnsvik SE9	6	kat_6	10.0
Groderhamnsvik SE9	7	kat_74	9.0
Groderhamnsvik SE9	8	kat_98	9.0
Groderhamnsvik SE9	9	kat_39	8.5
Groderhamnsvik SE9	10	kat_3	8.0
Gronevik Overon SE7	1	kat_19	21.0
Gronevik Overon SE7	2	kat_3	12.0
Gronevik Overon SE7	3	kat_15	11.0
Gronevik Overon SE7	4	kat_33	6.0
Gronevik Overon SE7	5	kat_48	5.0
Gronevik Overon SE7	6	kat_74	4.0
Gronevik Overon SE7	7	kat_2	3.0
Gronevik Overon SE7	8	kat_31	3.0
Gronevik Overon SE7	9	kat_39	3.0
Gronevik Overon SE7	10	kat_4	3.0
Haby SE4	1	kat_32	42.0
Haby SE4	2	kat_46	41.0
Haby SE4	3	kat_15	15.5
Haby SE4	4	kat_115	8.0
Haby SE4	5	kat_19	6.5

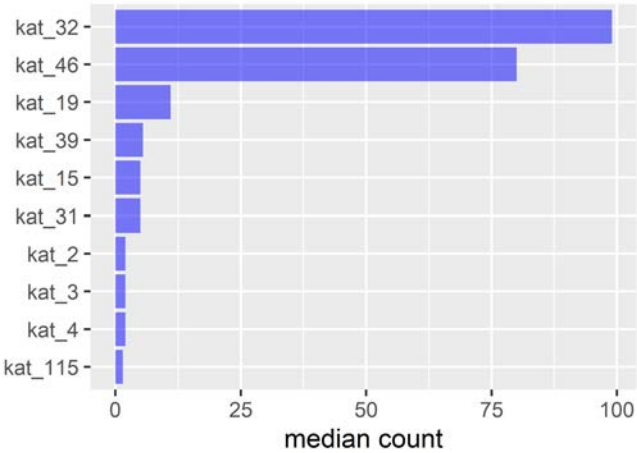
location_code	rank	type_name	median count
Haby SE4	6	kat_49	5.5
Haby SE4	7	kat_39	3.0
Haby SE4	8	kat_74	3.0
Haby SE4	9	kat_33	2.0
Haby SE4	10	kat_22	1.5
Jaravallen	1	kat_pl19	13.0
Jaravallen	2	kat_pl24	8.5
Jaravallen	3	kat_pl01	7.0
Jaravallen	4	kat_fp04	6.0
Jaravallen	5	kat_pl07	4.0
Jaravallen	6	kat_gc07	3.5
Jaravallen	7	kat_gc02	2.0
Jaravallen	8	kat_me02	2.0
Jaravallen	9	kat_me03	1.5
Jaravallen	10	kat_pl04	1.0
Sudde strand	1	kat_1	0.0
Sudde strand	2	kat_10	0.0
Sudde strand	3	kat_100	0.0
Sudde strand	4	kat_101	0.0
Sudde strand	5	kat_102	0.0
Sudde strand	6	kat_1021	0.0
Sudde strand	7	kat_103	0.0
Sudde strand	8	kat_104	0.0
Sudde strand	9	kat_105	0.0
Sudde strand	10	kat_1051	0.0

The figure(s) below show(s) for each location the top 10 of litter types.

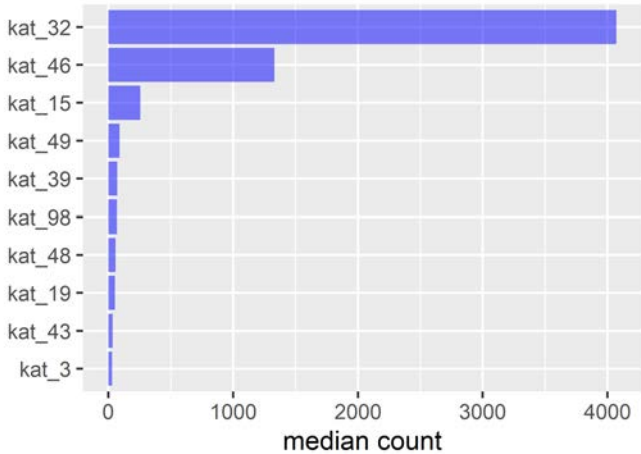
Angklavebukten - Salto - SE6



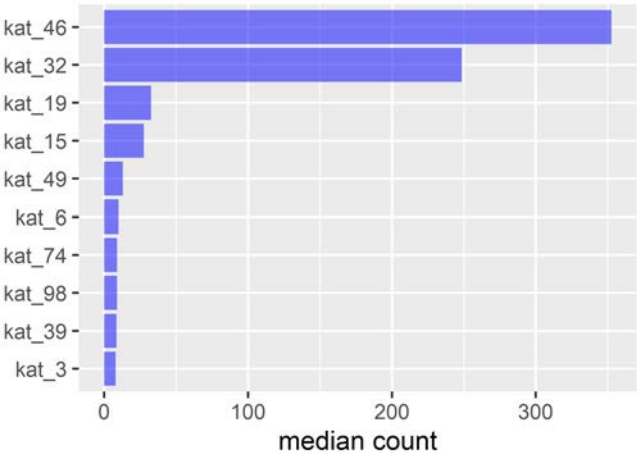
Barrevik SE8



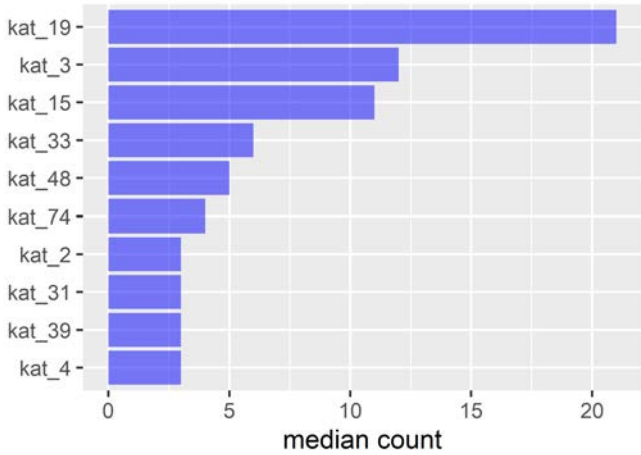
Edsvik SE5



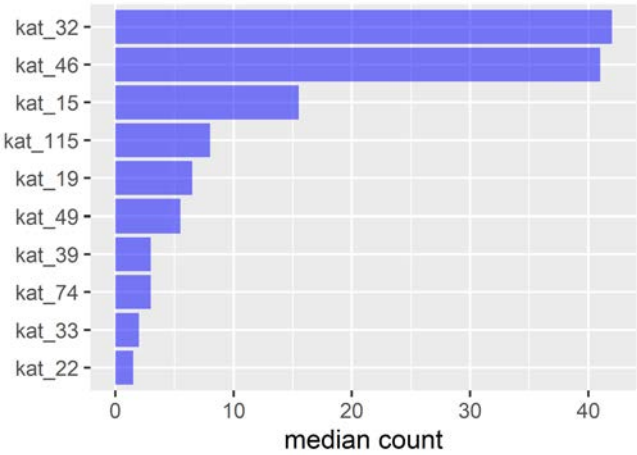
Groderhamnsvik SE9



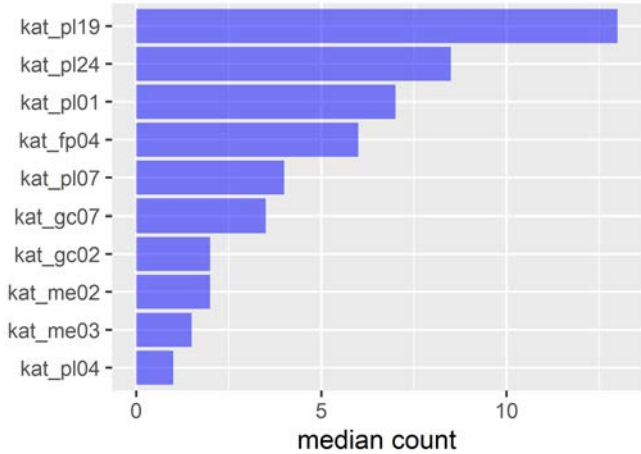
Gronevik Overon SE7



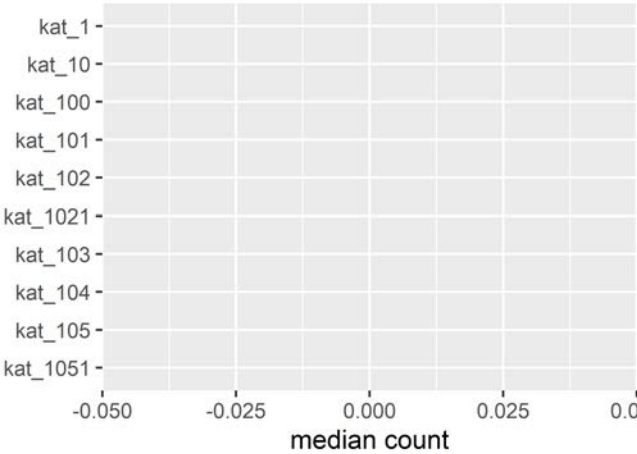
Haby SE4



Jaravallen



Sudde strand



Regional descriptive statistics

Basic statistics

The regional statistics for the litter groups are given in the table below. They all (except for the p-value) have been estimated in a stepwise fashion:

1. compute the statistic for each individual location within a specific region (see also previous section);

2. compute the same statistic for the results in step 1.

Note that these statistics are all so called intra-block statistics, *i.e.*, data from individual beaches are not merged. Instead, first the beach statistics are calculated and these are then aggregated as described below. Also note that these statistics, in fact, only describe the individual beaches within a region and not necessarily describe the region as a whole statistically correctly.

The statistics are:

- n : number of surveys;

mean : *i.e.*, the regional mean (https://en.wikipedia.org/wiki/Arithmetic_mean) of the individual mean beach counts within a region for each litter group;

median : *i.e.*, the regional median (<https://en.wikipedia.org/wiki/Median>) of the individual median beach counts within a region for each litter group;

slope : the median of the Theil-Sen slopes of the individual beaches within a region for each litter group. Data from different beaches have not been mixed in the computation of the Theil-Sen slopes. This method is similar to the one in Gilbert (1987) except that in our procedure all beaches within a region contribute equally to the regional trend.

p-value : the p-values for each regional trend (slope) are computed by means of the expressions given in Van Belle & Hughes, 1984 (<https://dx.doi.org/10.1029/WR020i001p00127>) (Eqs. 2 and 7) and Gilbert, 1987 (<https://www.osti.gov/biblio/7037501-statistical-methods-environmental-pollution-monitoring>) (Eqs. 17.1 - 17.5).

The trend statistics can only be computed if all location_code s of a region_code have at least three records (surveys). If that is not the case, the table below contains NA .

region_code	group_code	n	mean	median	slope	p-value
VH	TC	143	6828	365	-5.374	0.8282
VH	PLAST	143	6573	308.8	-5.121	0.8282
VH	FISH	143	4679	108.8	-1.203	0.9329
VH	SUP	143	521.6	59	-3.748	0.6172
VH	GUMMI	143	72.01	5.25	0	0.6782
VH	TRA	143	17.84	4.25	-0.6439	0.3839
VH	SANITET.MEDICINSKT	143	143.2	2.75	0	0.6945
VH	GLAS.KERAMIK	143	8.098	2.25	0	0.7695
VH	METALL	143	5.008	1.25	0	0.8581
VH	PAPPER.KARTONG	143	6.501	1	0	0.3163
VH	TYG	143	2.821	1	0	0.0260
VH	OLIKA.MATERIAL	143	0.1181	0	0	0.9880

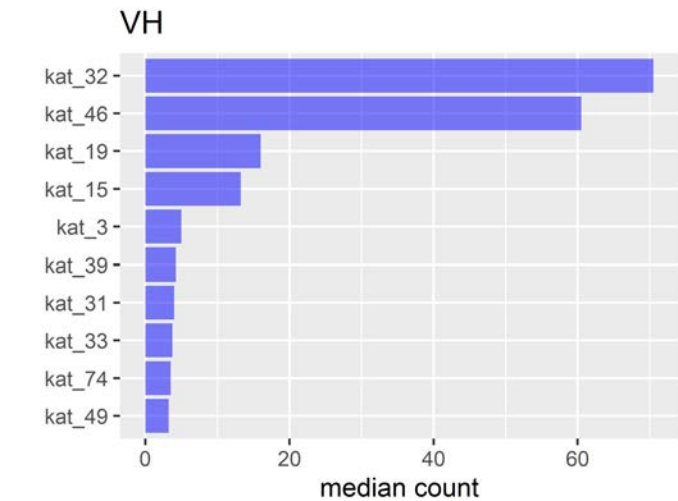
region_code	group_code	n	mean	median	slope	p-value
VH	ORGANISKT	143	0.04167	0	0	0.6542

Top 10

The table below gives for each region the top 10 of litter types, *i.e.*, the 10 litter types with the highest median litter counts.

region_code	rank	type_name	median count
VH	1	kat_32	70.5
VH	2	kat_46	60.5
VH	3	kat_19	16.0
VH	4	kat_15	13.2
VH	5	kat_3	5.0
VH	6	kat_39	4.2
VH	7	kat_31	4.0
VH	8	kat_33	3.8
VH	9	kat_74	3.5
VH	10	kat_49	3.2

The figure(s) below show(s) for each region the top 10 of litter types.



Trend analysis

For each location code and the type names and group codes specified in the settings file, the following statistics have been estimated for the period 2016-01-01 to 2021-12-31:

- from: the first date of the time-series;
- to: the final date of the time-series;

- Theil-Sen slope (https://en.wikipedia.org/wiki/Theil%E2%80%93Sen_estimator) (slope): a robust non-parametric estimator of slope (counts / year);
- p-value (<https://en.wikipedia.org/wiki/P-value>): the p-value associated with the one-tailed Mann-Kendall test (https://en.wikipedia.org/wiki/Kendall_rank_correlation_coefficient) to test the null hypothesis of
 - no monotonically *increasing* trend in case the Theil-Sen slope is greater than zero;
 - no monotonically *decreasing* trend in case the Theil-Sen slope is smaller than zero;
- the number of surveys (N);

A p-value less than an *a priori* specified significance level (https://en.wikipedia.org/wiki/Statistical_significance) (e.g., often $\alpha = 0.05$), indicates a significant trend. If the p-value is greater than this significance level, we can't say that there is no trend. We can only conclude that our data do not show evidence for a significant trend (due to lack of data, noise, etc.).

The Mann-Kendall test is a non-parametric test and as such does not make distributional assumptions on the data.

Warning: The following specified group code(s) are not found and will be skipped:
'KEMISKA.FORORENINGAR'

location_code	type name / group code	from	to	N	slope	p-value
Angklavebukten - Salto - SE6	TC	2016-04-15	2021-09-30	18	-266.1	0.1843
Angklavebukten - Salto - SE6	PLAST	2016-04-15	2021-09-30	18	-246.5	0.1467
Angklavebukten - Salto - SE6	FISH	2016-04-15	2021-09-30	18	-117.6	0.2051
Angklavebukten - Salto - SE6	SUP	2016-04-15	2021-09-30	18	-53.8	0.2271
Angklavebukten - Salto - SE6	SANITET.MEDICINSKT	2016-04-15	2021-09-30	18	-18.45	0.2504
Angklavebukten - Salto - SE6	GUMMI	2016-04-15	2021-09-30	18	-9.23	0.0655
Angklavebukten - Salto - SE6	TRA	2016-04-15	2021-09-30	18	-4.483	0.1443
Angklavebukten - Salto - SE6	TYG	2016-04-15	2021-09-30	18	-0.6623	0.0417
Angklavebukten - Salto - SE6	PAPPER.KARTONG	2016-04-15	2021-09-30	18	-0.4526	0.1488
Angklavebukten - Salto - SE6	METALL	2016-04-15	2021-09-30	18	-0.3162	0.3238
Angklavebukten - Salto - SE6	GLAS.KERAMIK	2016-04-15	2021-09-30	18	0	0.5906
Angklavebukten - Salto - SE6	OLIKA.MATERIAL	2016-04-15	2021-09-30	18	0	NA
Angklavebukten - Salto - SE6	ORGANISKT	2016-04-15	2021-09-30	18	0	NA
Barrevik SE8	PLAST	2016-04-12	2021-10-14	18	76.32	0.0876
Barrevik SE8	TC	2016-04-12	2021-10-14	18	75.53	0.1004
Barrevik SE8	FISH	2016-04-12	2021-10-14	18	56.4	0.0069
Barrevik SE8	SUP	2016-04-12	2021-10-14	18	4.583	0.1648
Barrevik SE8	GLAS.KERAMIK	2016-04-12	2021-10-14	18	0	0.7371
Barrevik SE8	GUMMI	2016-04-12	2021-10-14	18	0	0.8270
Barrevik SE8	METALL	2016-04-12	2021-10-14	18	0	0.6077
Barrevik SE8	OLIKA.MATERIAL	2016-04-12	2021-10-14	18	0	NA
Barrevik SE8	ORGANISKT	2016-04-12	2021-10-14	18	0	NA
Barrevik SE8	PAPPER.KARTONG	2016-04-12	2021-10-14	18	0	0.4002
Barrevik SE8	SANITET.MEDICINSKT	2016-04-12	2021-10-14	18	0	0.9301

location_code	type name / group code	from	to	N	slope	p-value
Barrevik SE8	TRA	2016-04-12	2021-10-14	18	0	0.7950
Barrevik SE8	TYG	2016-04-12	2021-10-14	18	0	0.4301
Edsvik SE5	TC	2016-04-01	2021-09-29	18	-281.8	0.3270
Edsvik SE5	PLAST	2016-04-01	2021-09-29	18	-265.2	0.3005
Edsvik SE5	FISH	2016-04-01	2021-09-29	18	-93.18	0.4703
Edsvik SE5	SUP	2016-04-01	2021-09-29	18	-66.52	0.1004
Edsvik SE5	SANITET.MEDICINSKT	2016-04-01	2021-09-29	18	-23.76	0.0749
Edsvik SE5	GUMMI	2016-04-01	2021-09-29	18	-13.07	0.1145
Edsvik SE5	TRA	2016-04-01	2021-09-29	18	-2.008	0.1353
Edsvik SE5	METALL	2016-04-01	2021-09-29	18	-0.6265	0.0248
Edsvik SE5	GLAS.KERAMIK	2016-04-01	2021-09-29	18	-0.416	0.2696
Edsvik SE5	TYG	2016-04-01	2021-09-29	18	-0.1985	0.0546
Edsvik SE5	OLIKA.MATERIAL	2016-04-01	2021-09-29	18	0	NA
Edsvik SE5	ORGANISKT	2016-04-01	2021-09-29	18	0	NA
Edsvik SE5	PAPPER.KARTONG	2016-04-01	2021-09-29	18	0	0.3065
Groderhamnsvik SE9	TC	2016-04-23	2021-09-21	18	-217.7	0.0054
Groderhamnsvik SE9	PLAST	2016-04-23	2021-09-21	18	-194.1	0.0069
Groderhamnsvik SE9	FISH	2016-04-23	2021-09-21	18	-83.36	0.0086
Groderhamnsvik SE9	SUP	2016-04-23	2021-09-21	18	-18.46	0.0479
Groderhamnsvik SE9	GLAS.KERAMIK	2016-04-23	2021-09-21	18	-4.24	0.0588
Groderhamnsvik SE9	GUMMI	2016-04-23	2021-09-21	18	-3.979	0.0040
Groderhamnsvik SE9	SANITET.MEDICINSKT	2016-04-23	2021-09-21	18	-1.648	0.0340
Groderhamnsvik SE9	TRA	2016-04-23	2021-09-21	18	-1.455	0.0852
Groderhamnsvik SE9	METALL	2016-04-23	2021-09-21	18	0	0.7579
Groderhamnsvik SE9	OLIKA.MATERIAL	2016-04-23	2021-09-21	18	0	NA
Groderhamnsvik SE9	ORGANISKT	2016-04-23	2021-09-21	18	0	NA
Groderhamnsvik SE9	PAPPER.KARTONG	2016-04-23	2021-09-21	18	0	0.0675
Groderhamnsvik SE9	TYG	2016-04-23	2021-09-21	18	0	0.0626
Gronevik Overon SE7	TC	2016-04-15	2021-10-01	17	-16.18	0.0539
Gronevik Overon SE7	PLAST	2016-04-15	2021-10-01	17	-14.28	0.0644
Gronevik Overon SE7	SUP	2016-04-15	2021-10-01	17	-8.576	0.0687
Gronevik Overon SE7	FISH	2016-04-15	2021-10-01	17	-3.078	0.0117
Gronevik Overon SE7	TRA	2016-04-15	2021-10-01	17	-0.5674	0.1447
Gronevik Overon SE7	TYG	2016-04-15	2021-10-01	17	-0.331	0.0065
Gronevik Overon SE7	GLAS.KERAMIK	2016-04-15	2021-10-01	17	0	0.3593
Gronevik Overon SE7	GUMMI	2016-04-15	2021-10-01	17	0	0.3374

location_code	type name / group code	from	to	N	slope	p-value
Gronevik Overon SE7	METALL	2016-04-15	2021-10-01	17	0	0.7140
Gronevik Overon SE7	OLIKA.MATERIAL	2016-04-15	2021-10-01	17	0	NA
Gronevik Overon SE7	ORGANISKT	2016-04-15	2021-10-01	17	0	NA
Gronevik Overon SE7	PAPPER.KARTONG	2016-04-15	2021-10-01	17	0	0.7136
Gronevik Overon SE7	SANITET.MEDICINSKT	2016-04-15	2021-10-01	17	0	0.3657
Haby SE4	TC	2016-04-05	2021-09-20	18	138.3	0.0002
Haby SE4	PLAST	2016-04-05	2021-09-20	18	124	0.0003
Haby SE4	FISH	2016-04-05	2021-09-20	18	43.72	0.0006
Haby SE4	SUP	2016-04-05	2021-09-20	18	10.74	0.0014
Haby SE4	GUMMI	2016-04-05	2021-09-20	18	2.483	0.0008
Haby SE4	SANITET.MEDICINSKT	2016-04-05	2021-09-20	18	1.622	0.0032
Haby SE4	TRA	2016-04-05	2021-09-20	18	1.345	0.0084
Haby SE4	GLAS.KERAMIK	2016-04-05	2021-09-20	18	0.9952	0.0127
Haby SE4	METALL	2016-04-05	2021-09-20	18	0	0.9341
Haby SE4	OLIKA.MATERIAL	2016-04-05	2021-09-20	18	0	NA
Haby SE4	ORGANISKT	2016-04-05	2021-09-20	18	0	NA
Haby SE4	PAPPER.KARTONG	2016-04-05	2021-09-20	18	0	0.9742
Haby SE4	TYG	2016-04-05	2021-09-20	18	0	0.6937
Jaravallen	TC	2016-04-24	2021-11-12	18	37.65	0.1300
Jaravallen	PLAST	2016-04-24	2021-11-12	18	32.81	0.1004
Jaravallen	SUP	2016-04-24	2021-11-12	18	3.308	0.2475
Jaravallen	FISH	2016-04-24	2021-11-12	18	1.543	0.2239
Jaravallen	TYG	2016-04-24	2021-11-12	18	1.23	0.1431
Jaravallen	GUMMI	2016-04-24	2021-11-12	18	1.089	0.0285
Jaravallen	TRA	2016-04-24	2021-11-12	18	-0.7204	0.1878
Jaravallen	METALL	2016-04-24	2021-11-12	18	0.6647	0.1265
Jaravallen	GLAS.KERAMIK	2016-04-24	2021-11-12	18	0.5628	0.2344
Jaravallen	PAPPER.KARTONG	2016-04-24	2021-11-12	18	-0.4395	0.0946
Jaravallen	OLIKA.MATERIAL	2016-04-24	2021-11-12	18	0	0.5832
Jaravallen	ORGANISKT	2016-04-24	2021-11-12	18	0	0.7796
Jaravallen	SANITET.MEDICINSKT	2016-04-24	2021-11-12	18	0	0.8334
Sudde strand	TC	2016-05-10	2021-11-06	18	5.437	0.0114
Sudde strand	PLAST	2016-05-10	2021-11-06	18	4.035	0.0125
Sudde strand	SUP	2016-05-10	2021-11-06	18	1.08	0.0837
Sudde strand	FISH	2016-05-10	2021-11-06	18	0.6714	0.0002
Sudde strand	GLAS.KERAMIK	2016-05-10	2021-11-06	18	0	0.8804

location_code	type name / group code	from	to	N	slope	p-value
Sudde strand	GUMMI	2016-05-10	2021-11-06	18	0	0.9398
Sudde strand	METALL	2016-05-10	2021-11-06	18	0	0.9529
Sudde strand	OLIKA.MATERIAL	2016-05-10	2021-11-06	18	0	0.9954
Sudde strand	ORGANISKT	2016-05-10	2021-11-06	18	0	0.3862
Sudde strand	PAPPER.KARTONG	2016-05-10	2021-11-06	18	0	0.9473
Sudde strand	SANITET.MEDICINSKT	2016-05-10	2021-11-06	18	0	0.9465
Sudde strand	TRA	2016-05-10	2021-11-06	18	0	0.9592
Sudde strand	TYG	2016-05-10	2021-11-06	18	0	0.7061

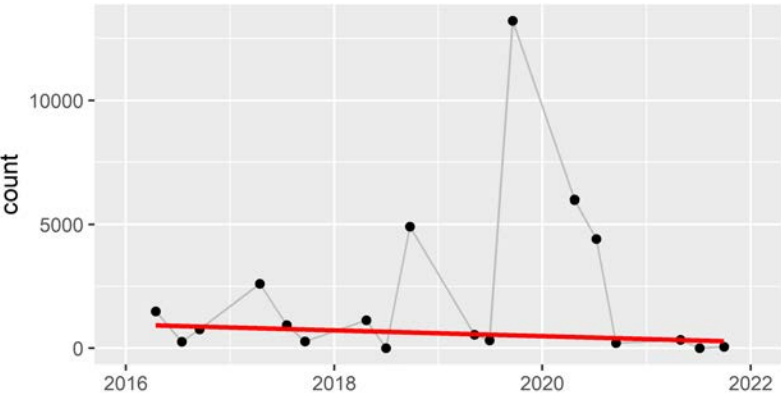
Descriptive statisics and trend analysis results have been stored in file ‘litteR-results-20230328T153019.csv’.

Time-series of the selected type names, group codes and and spatial codes are given in the plots below, including trend line and smoother.

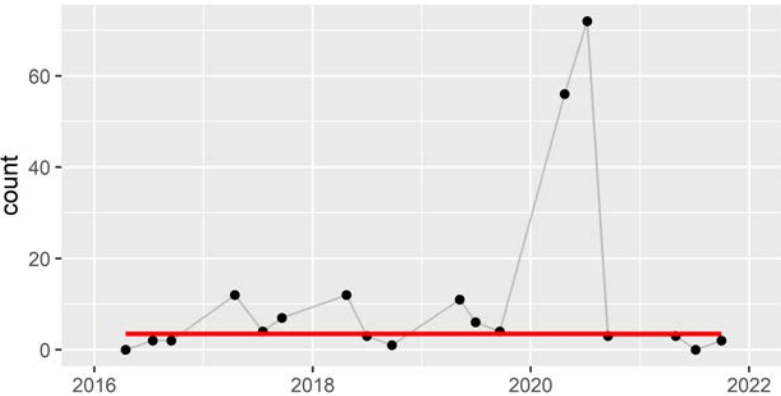
The lines and dots have the following meaning:

- dots: observations;
- thin gray line segments: auxiliary line segments to guide the eye (only given for 5 to 24 points);
- blue line: loess-smoother (https://en.wikipedia.org/wiki/Local_regression). It is only given for 25 or more points;
- red line: Theil-Sen trend line (its slope is given in the table above). It is only given for 5 or more points. However, it is recommended to use a minimum period of 4 to 5 years to obtain useful trend results.

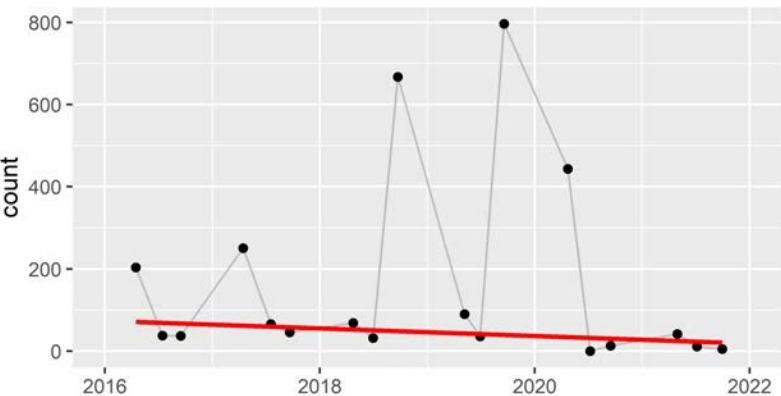
Angklavebukten - Salto - SE6 FISH



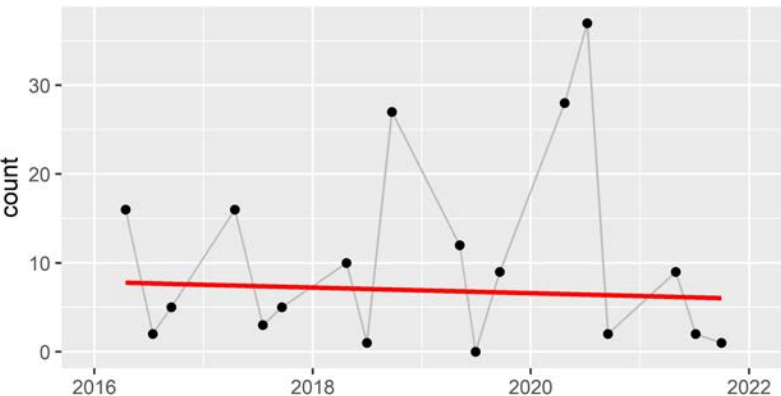
Angklavebukten - Salto - SE6 GLAS.KERAMIK

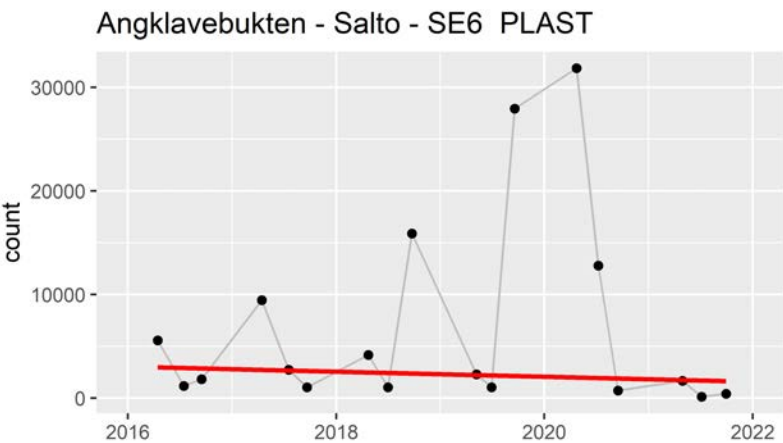
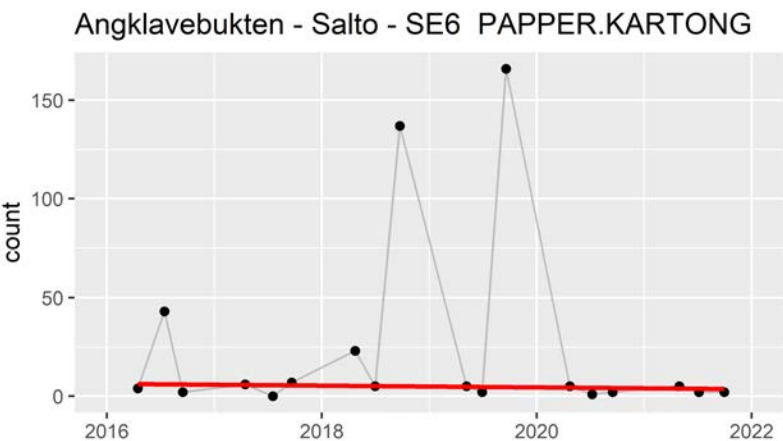
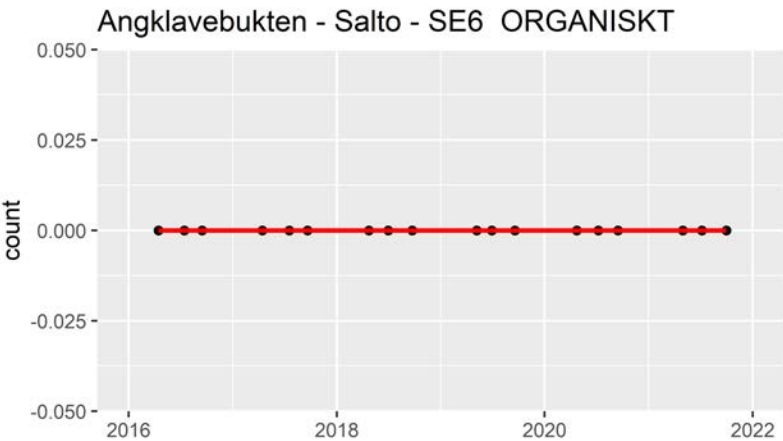
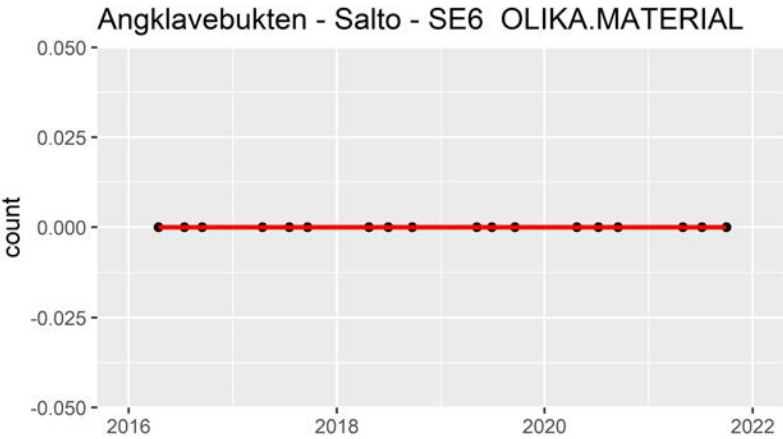


Angklavebukten - Salto - SE6 GUMMI

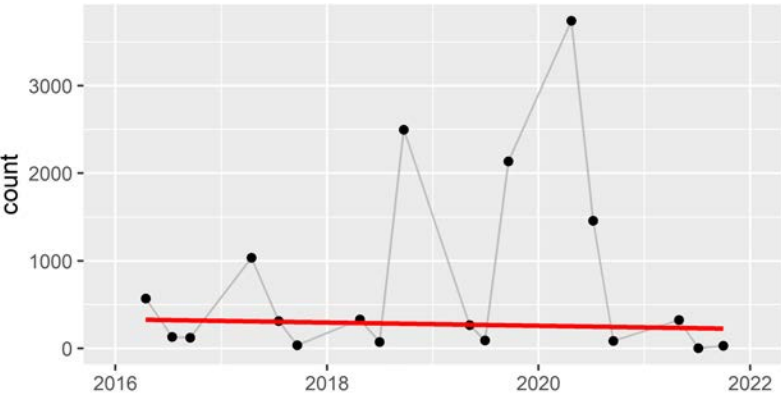


Angklavebukten - Salto - SE6 METALL

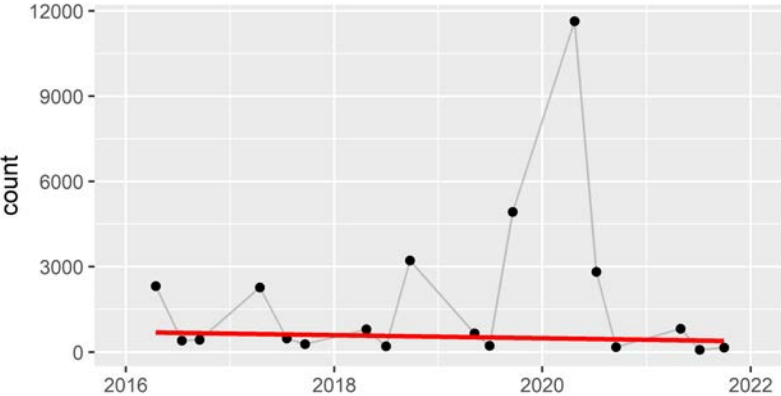




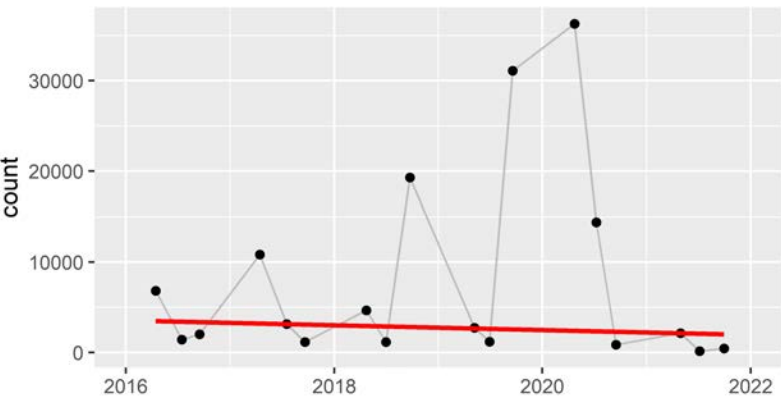
Angklavebukten - Salto - SE6 SANITET.MEDICINSK1



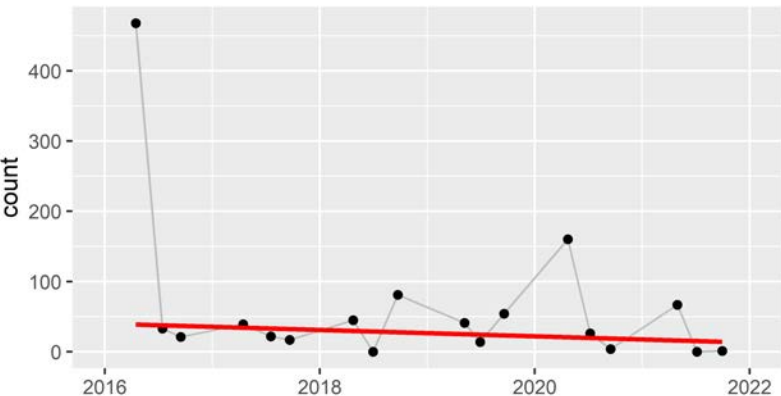
Angklavebukten - Salto - SE6 SUP



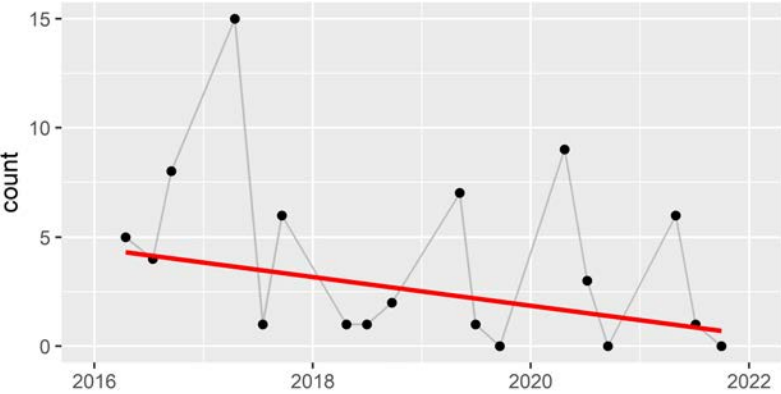
Angklavebukten - Salto - SE6 TC



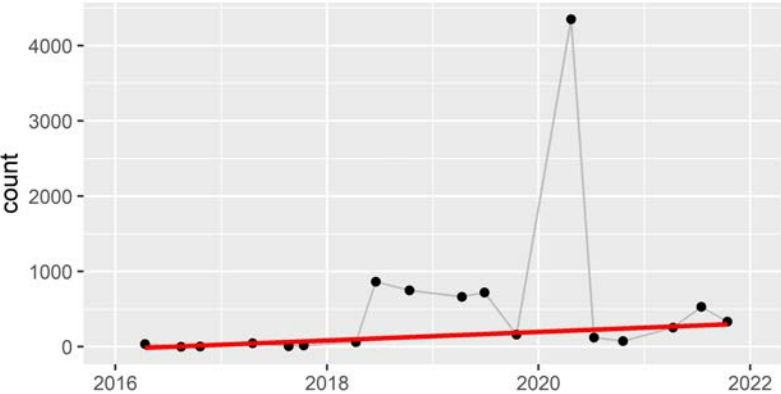
Angklavebukten - Salto - SE6 TRA



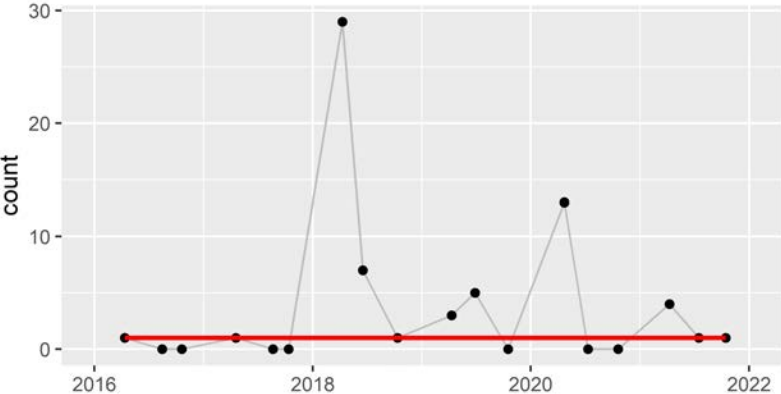
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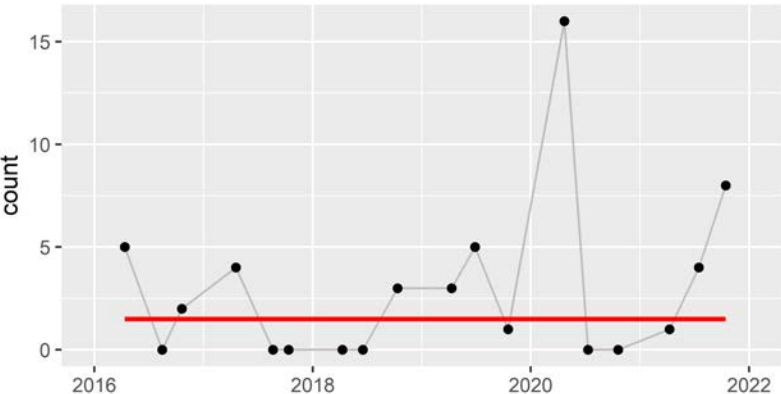
Barrevik SE8 FISH



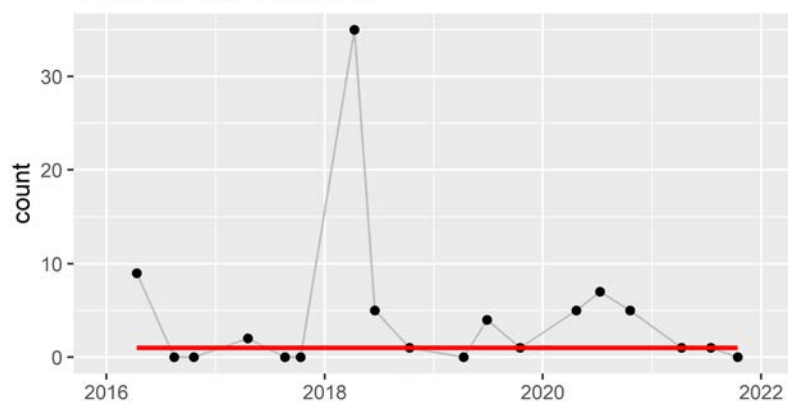
Barrevik SE8 GLAS.KERAMIK



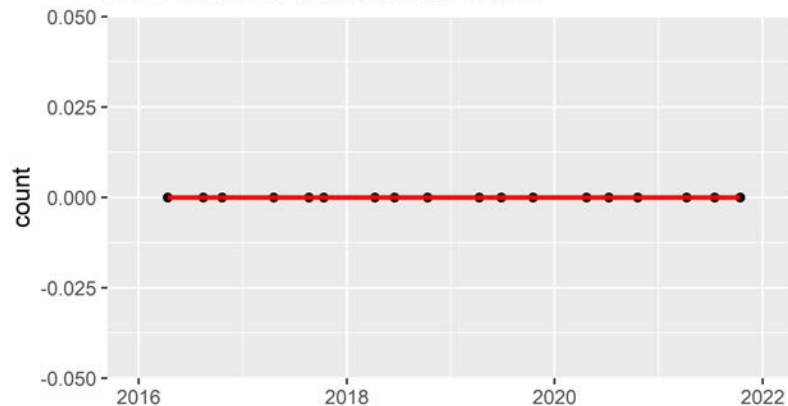
Barrevik SE8 GUMMI



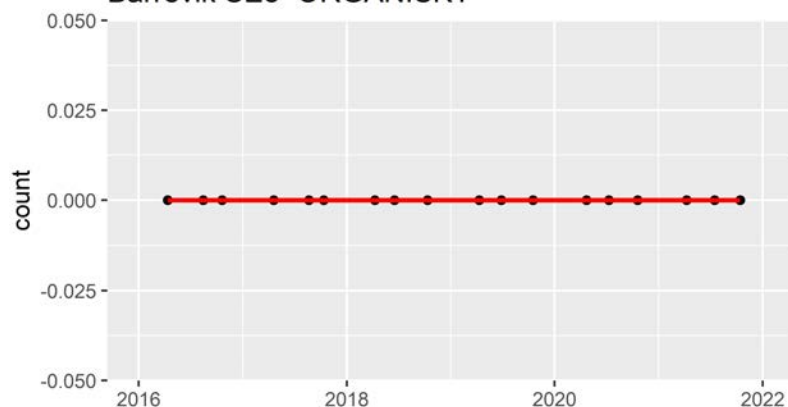
Barrevik SE8 METALL



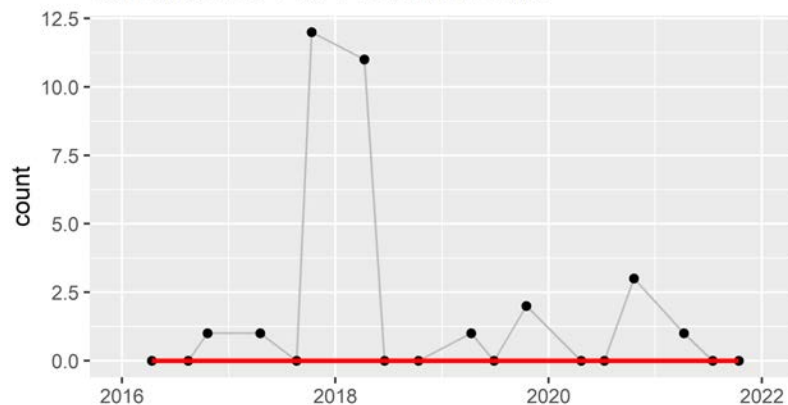
Barrevik SE8 OLIKA.MATERIAL



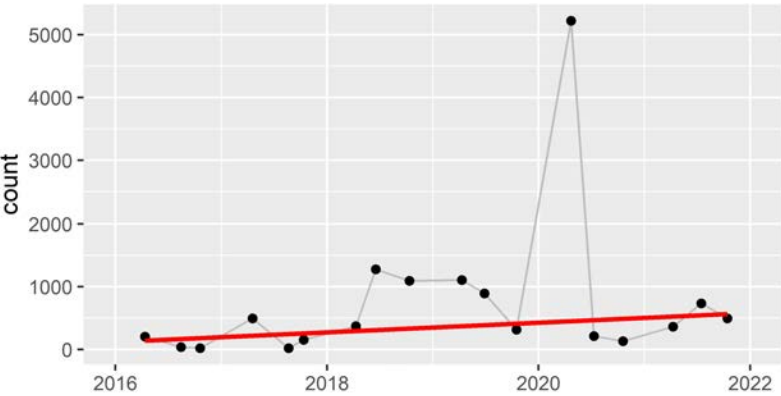
Barrevik SE8 ORGANISKT



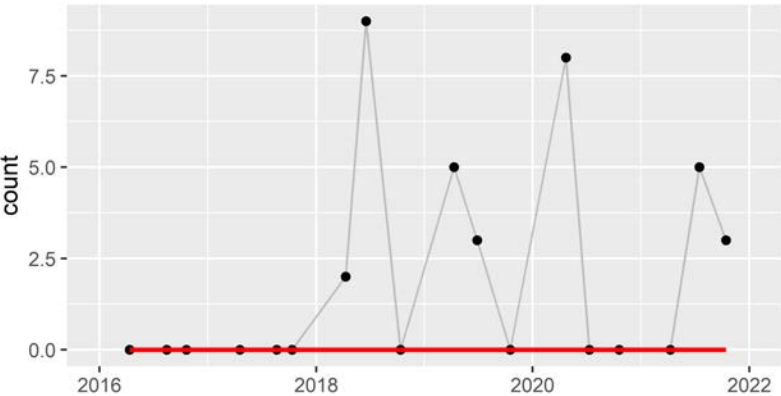
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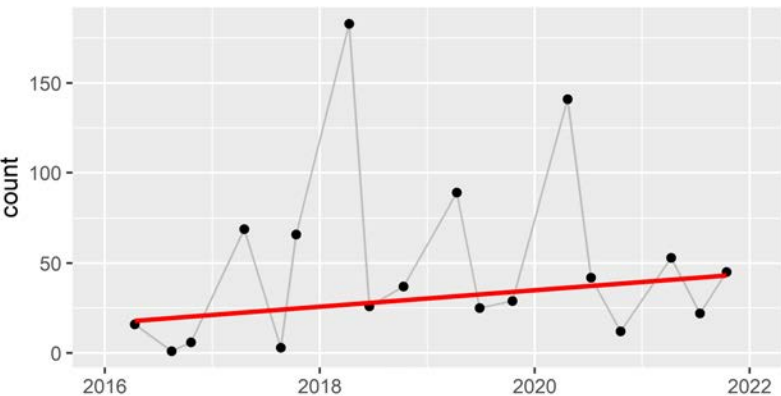
Barrevik SE8 PLAST



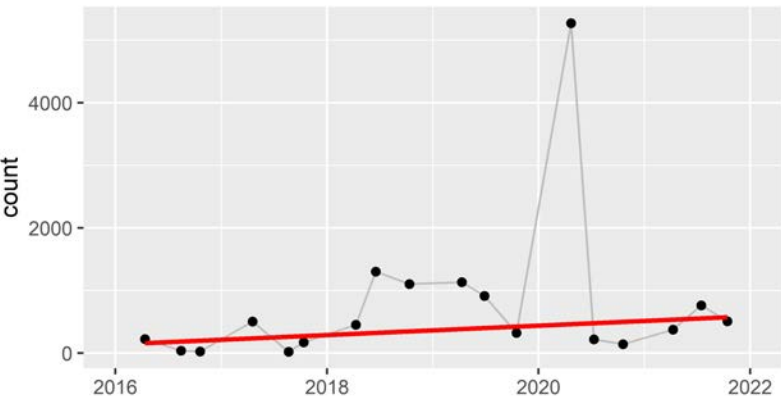
Barrevik SE8 SANITET.MEDICINSKT

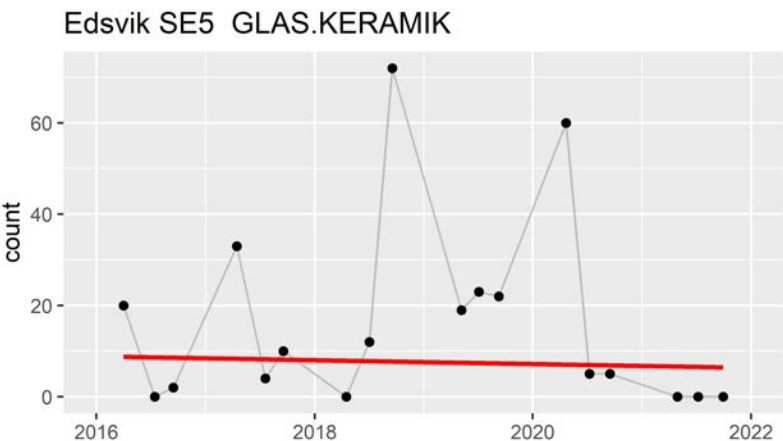
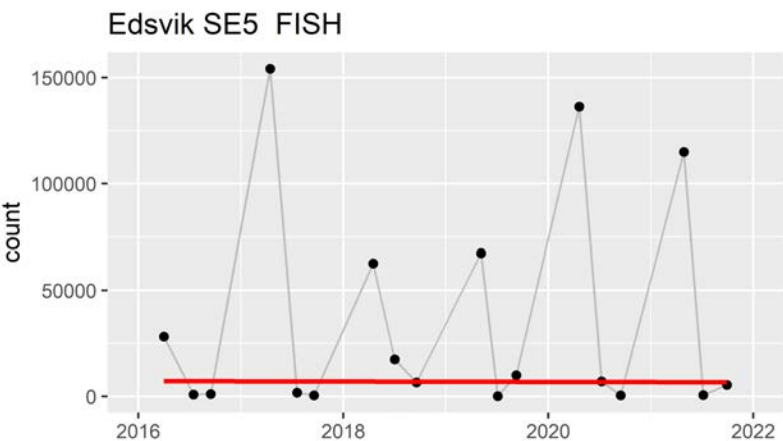
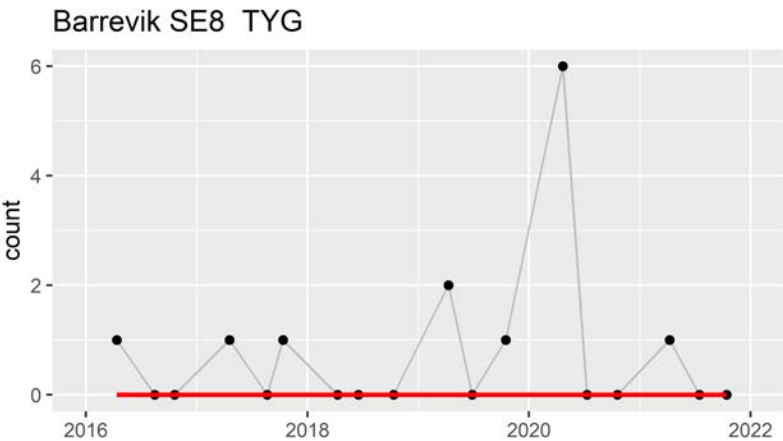
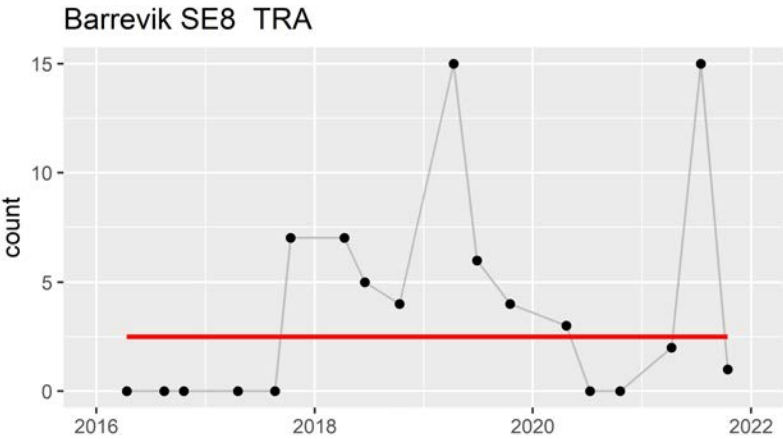


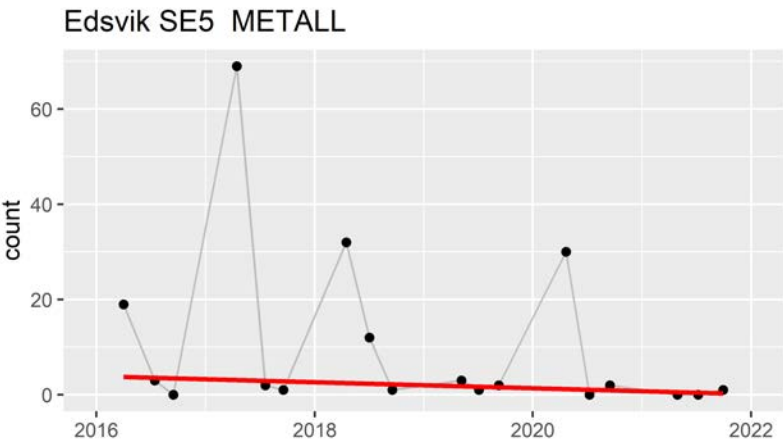
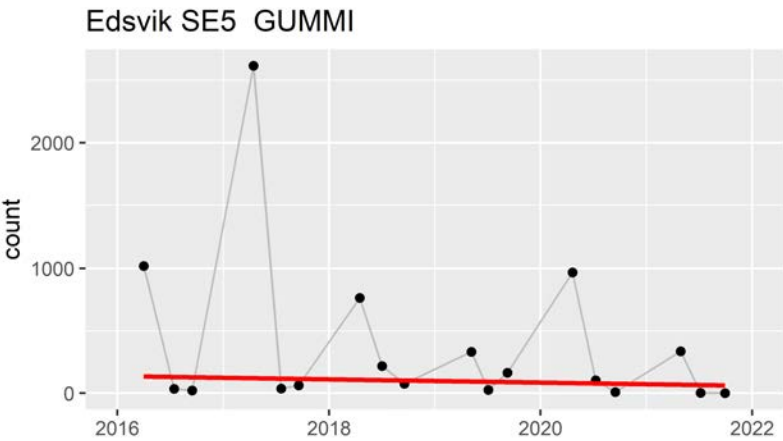
Barrevik SE8 SUP

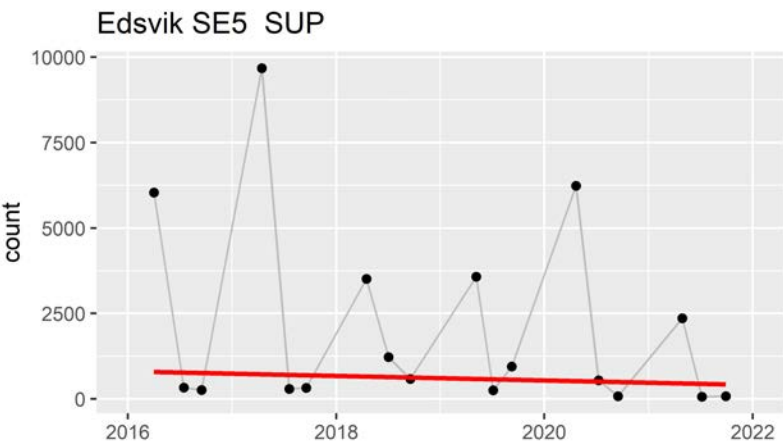
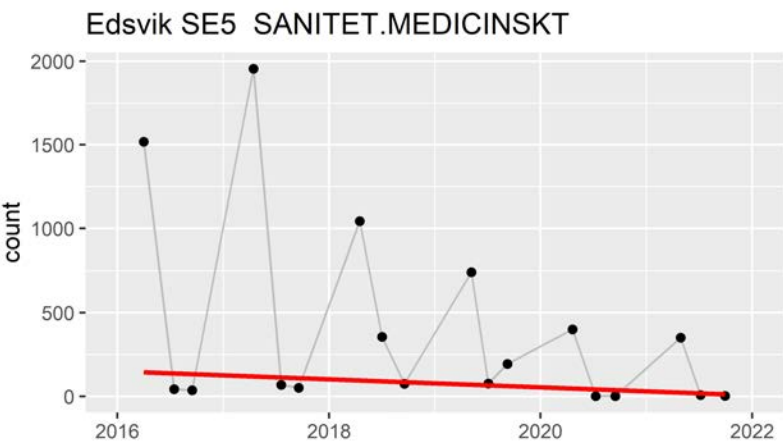
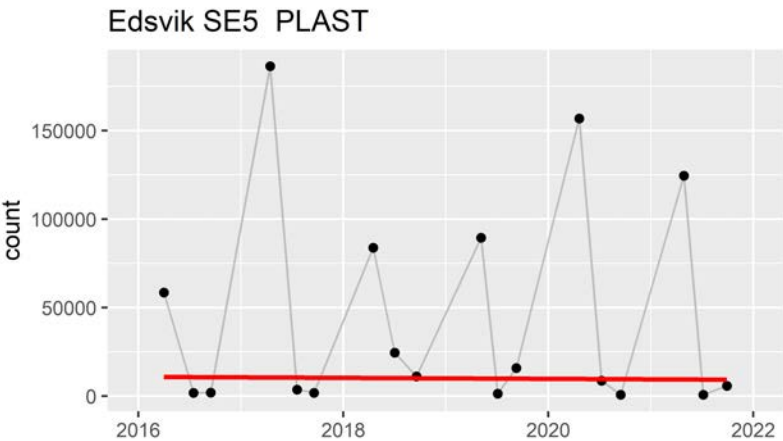
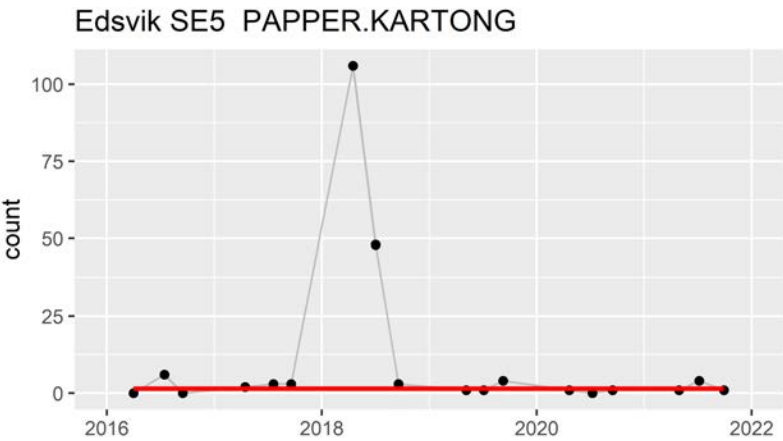


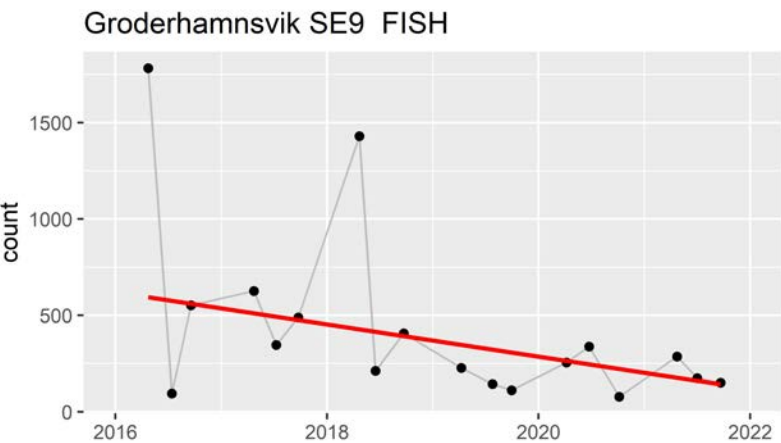
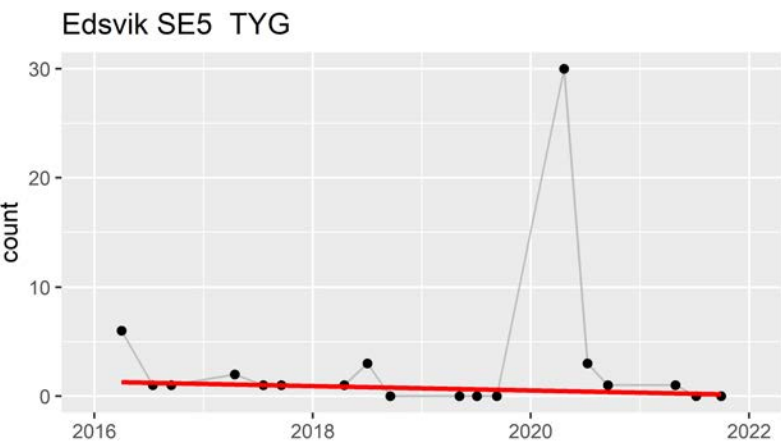
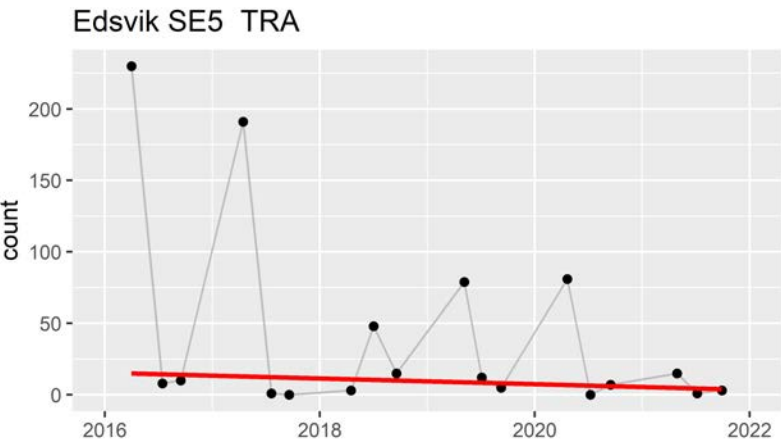
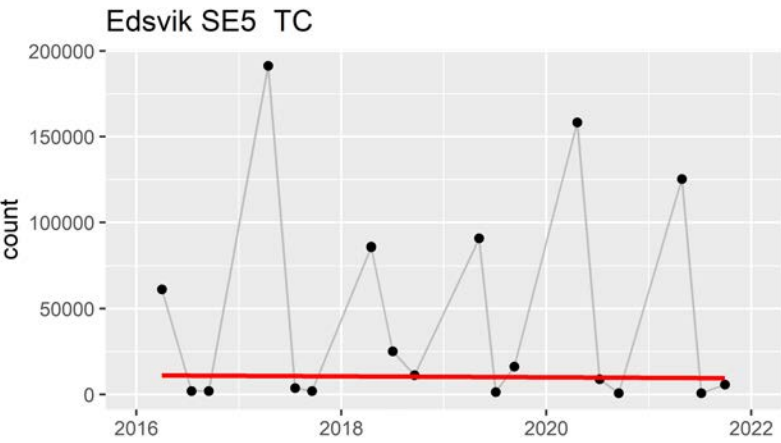
Barrevik SE8 TC



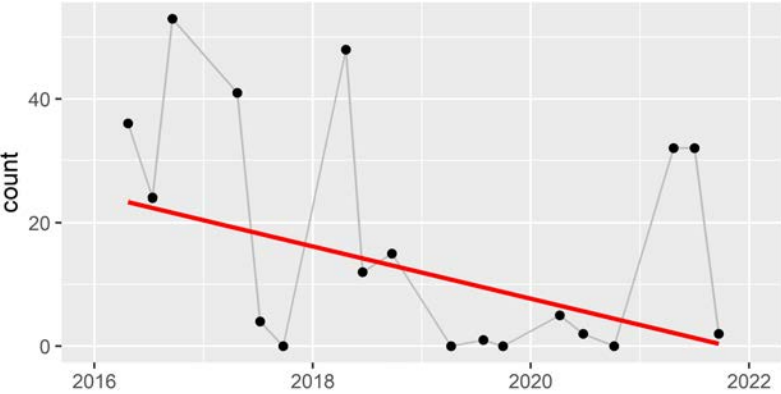




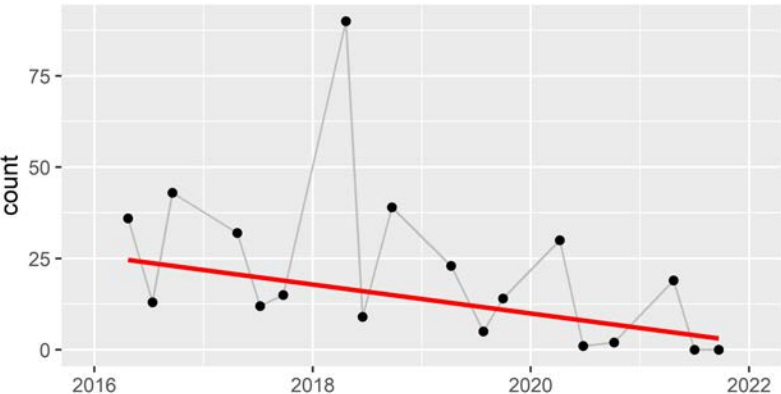




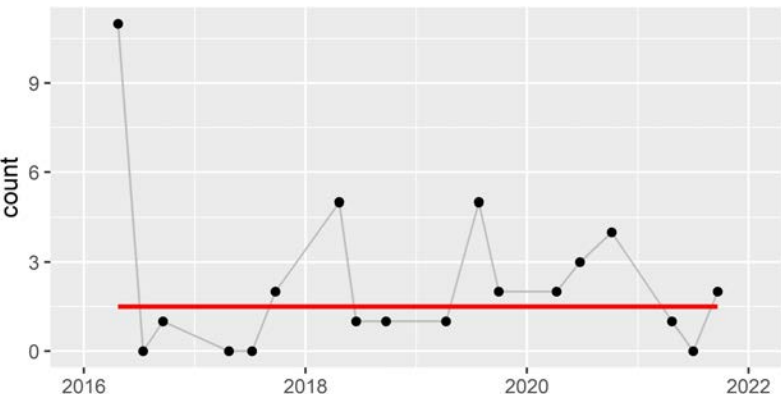
Groderhamnsvik SE9 GLAS.KERAMIK



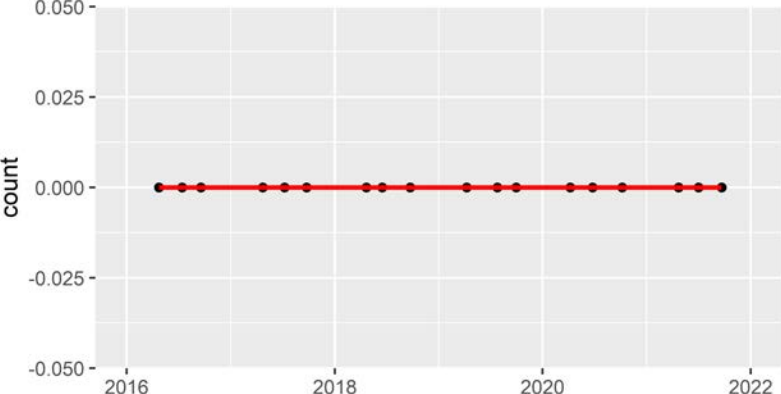
Groderhamnsvik SE9 GUMMI

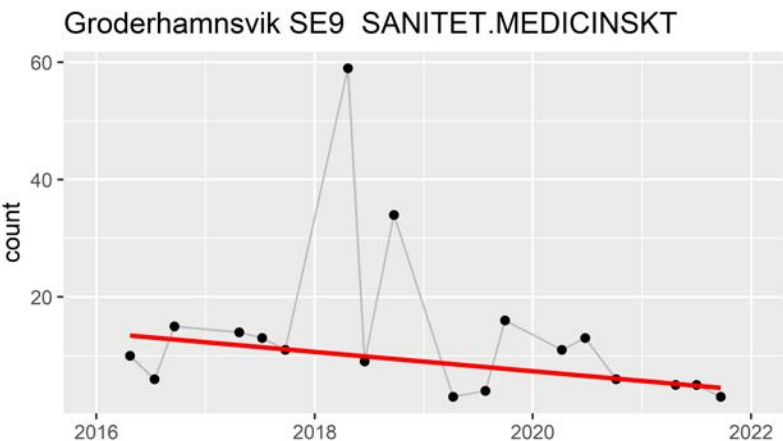
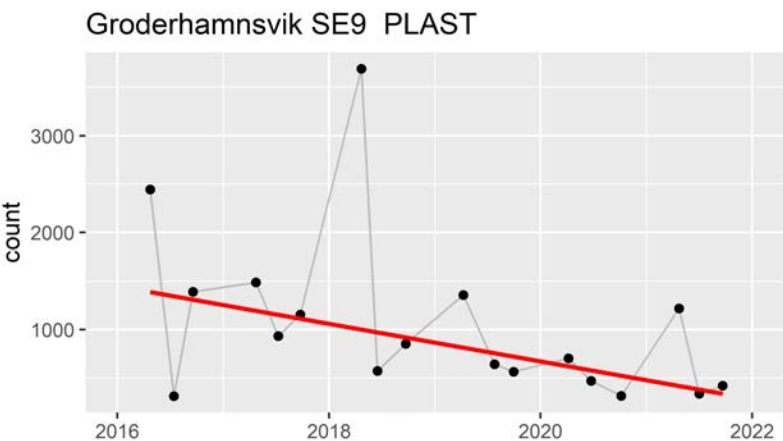
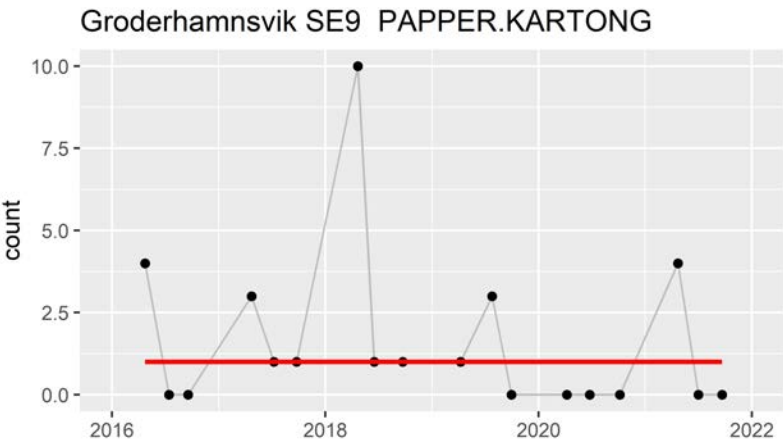
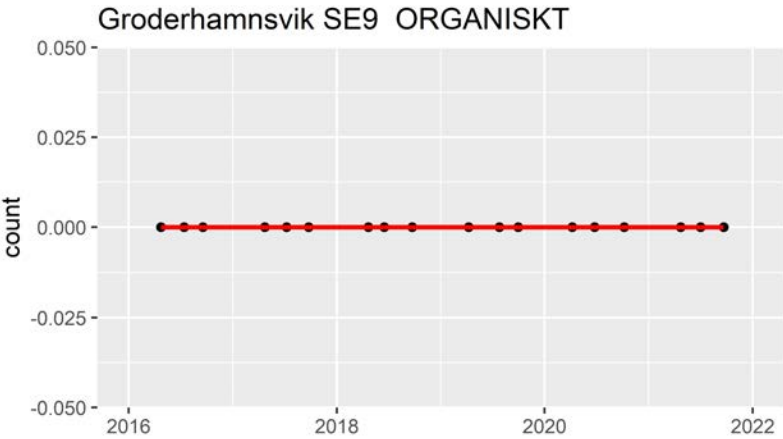


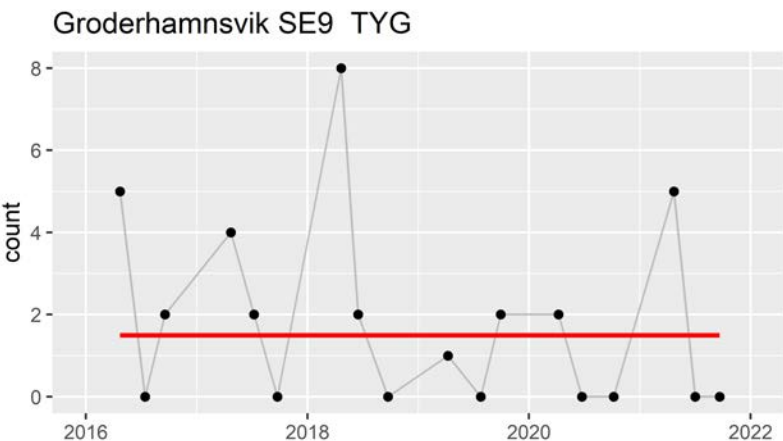
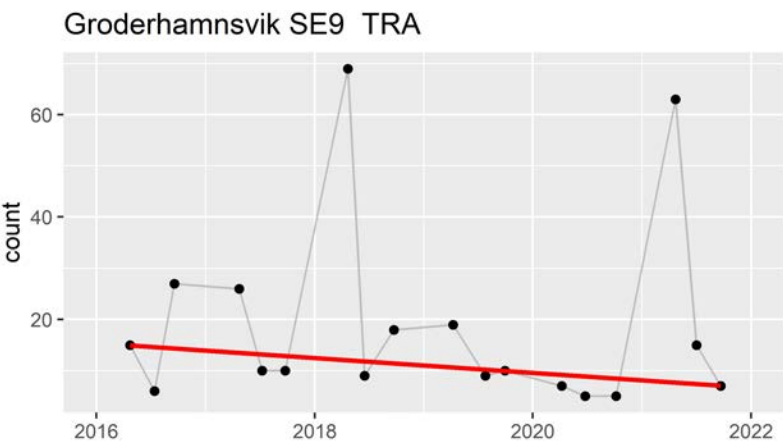
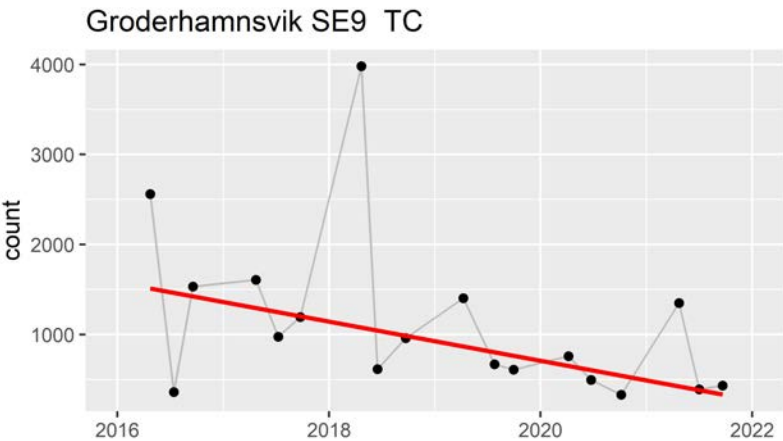
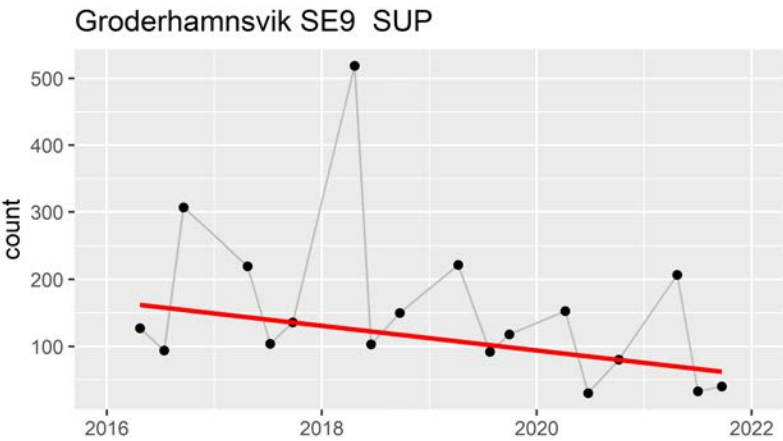
Groderhamnsvik SE9 METALL



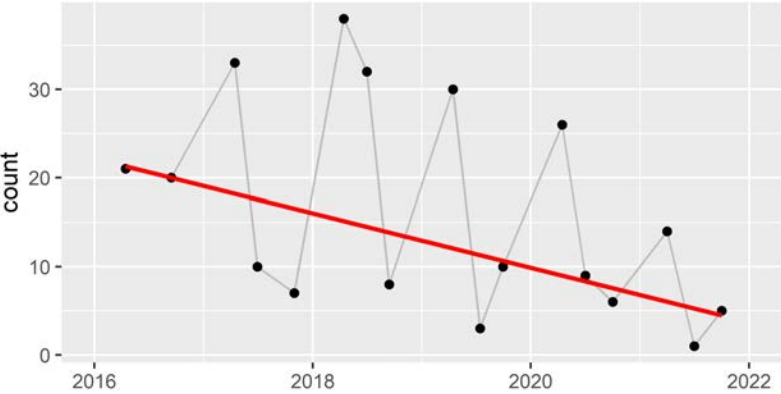
Groderhamnsvik SE9 OLIKA.MATERIAL



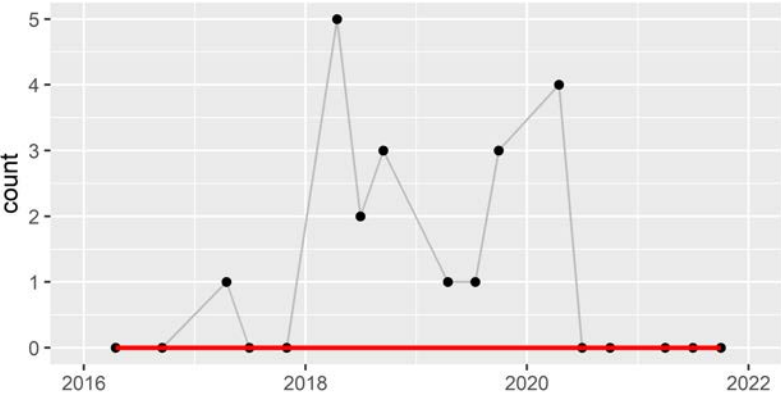




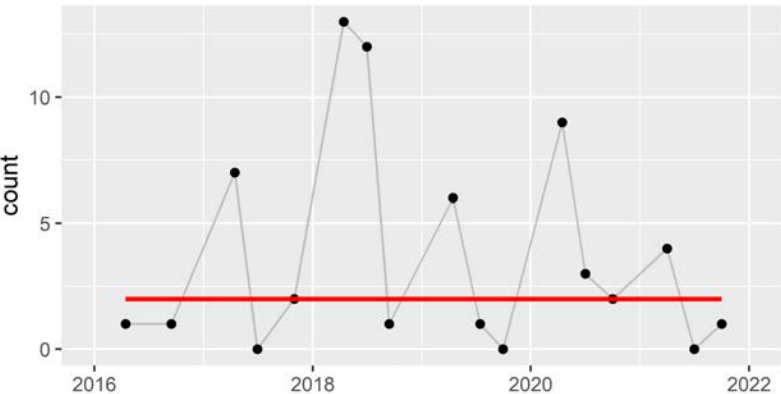
Gronevik Overon SE7 FISH



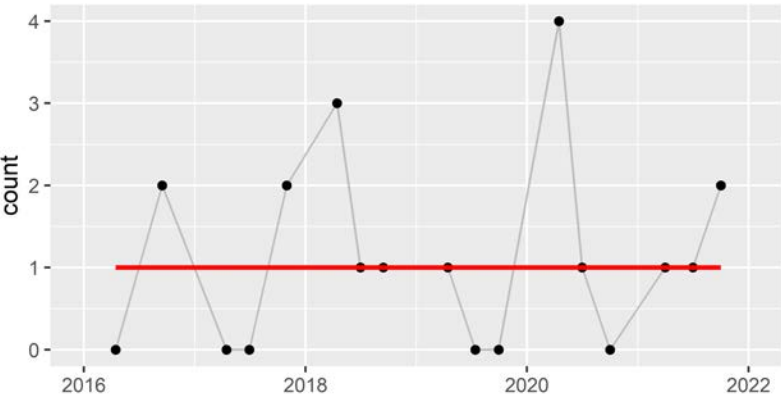
Gronevik Overon SE7 GLAS.KERAMIK

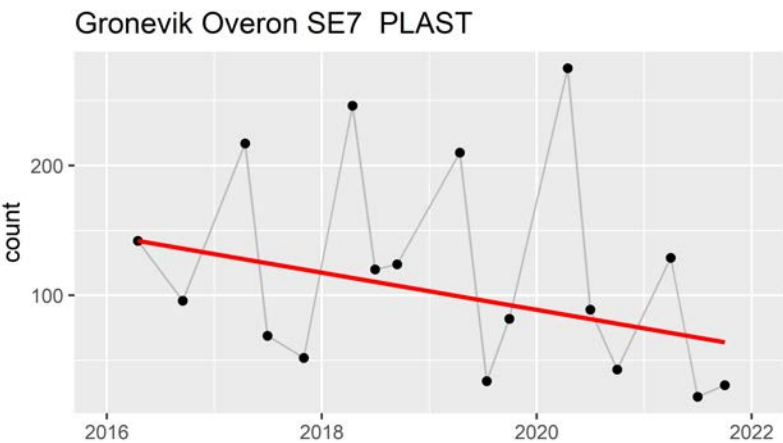
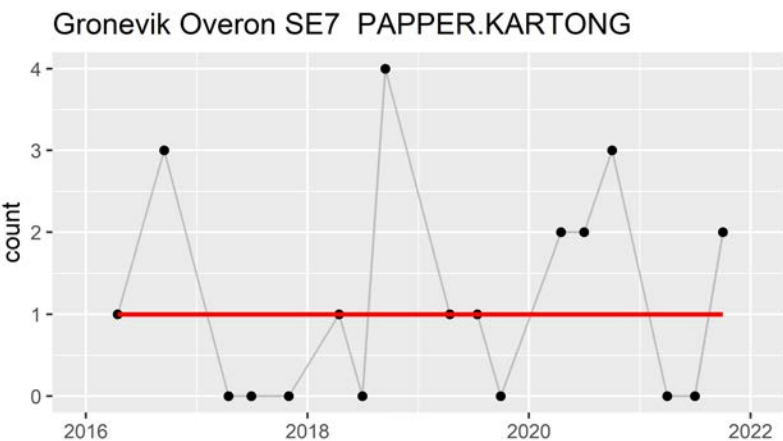
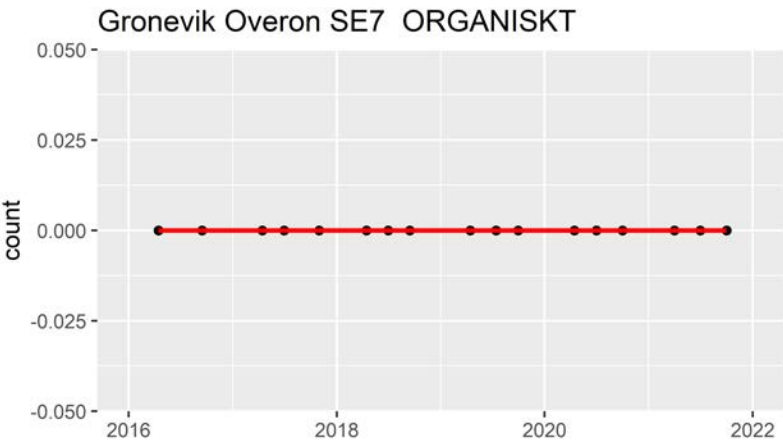
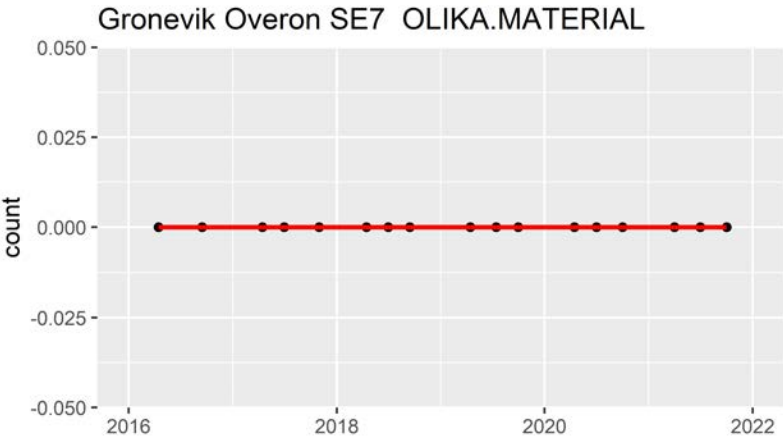


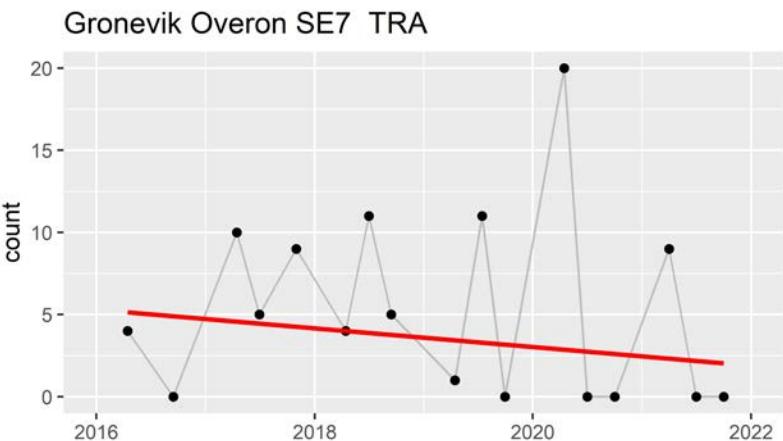
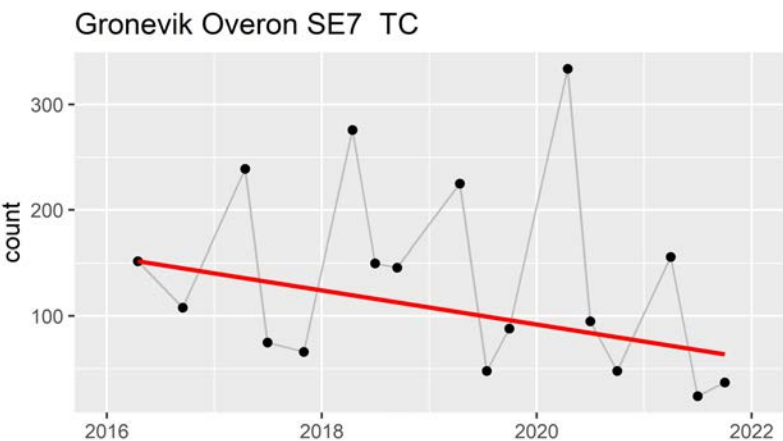
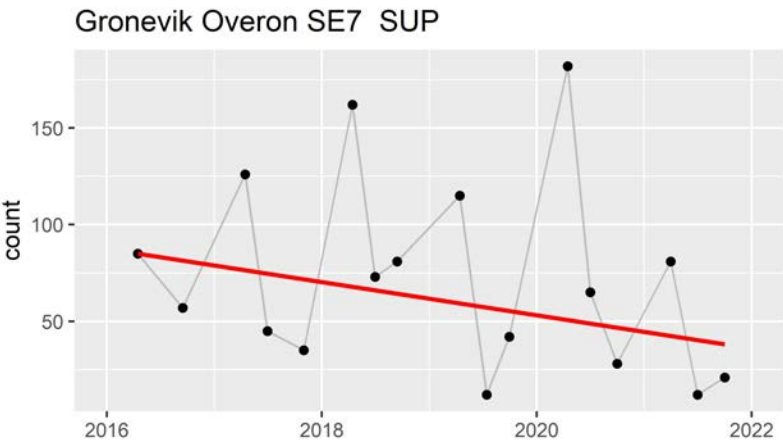
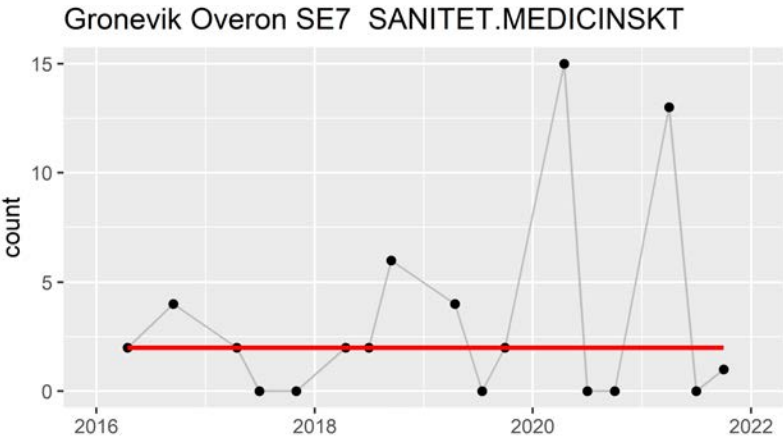
Gronevik Overon SE7 GUMMI

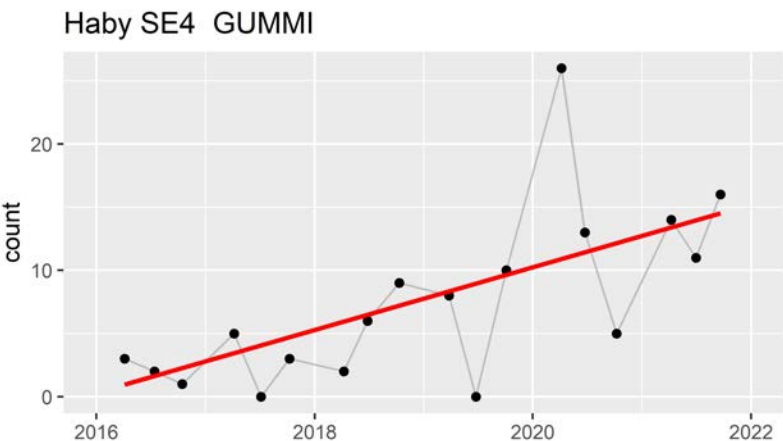
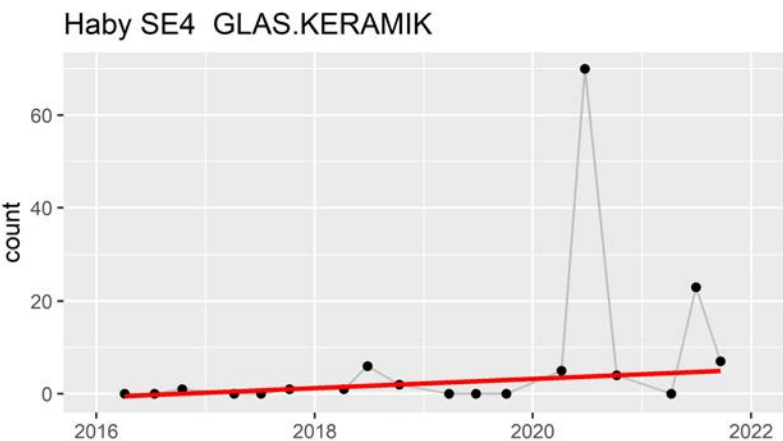
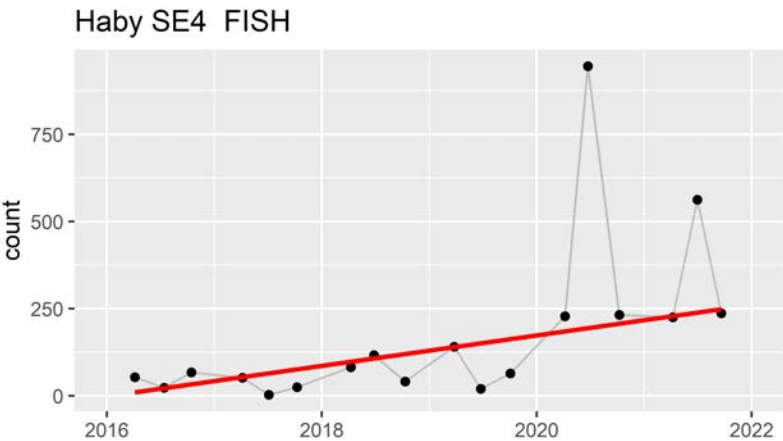
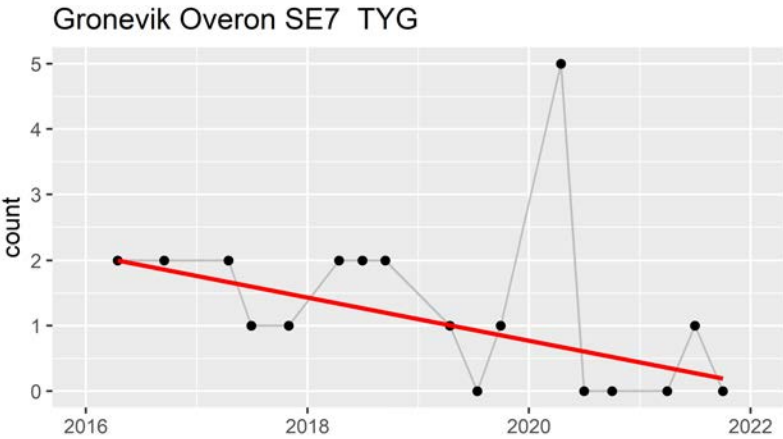


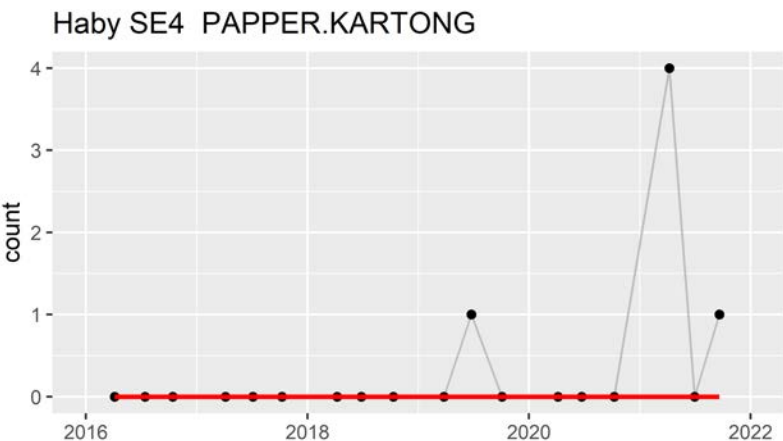
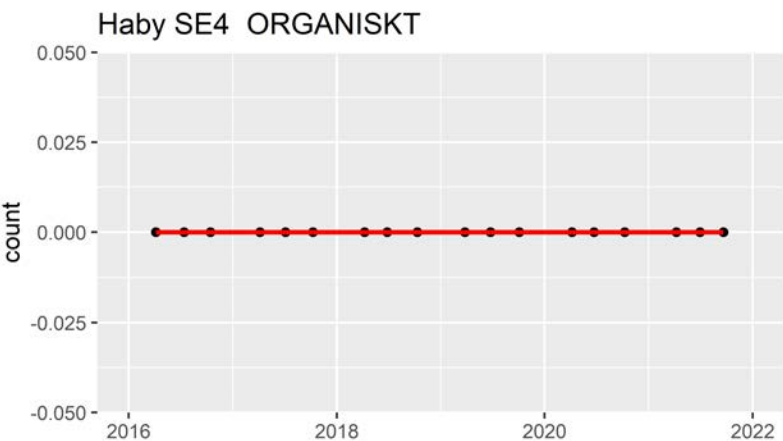
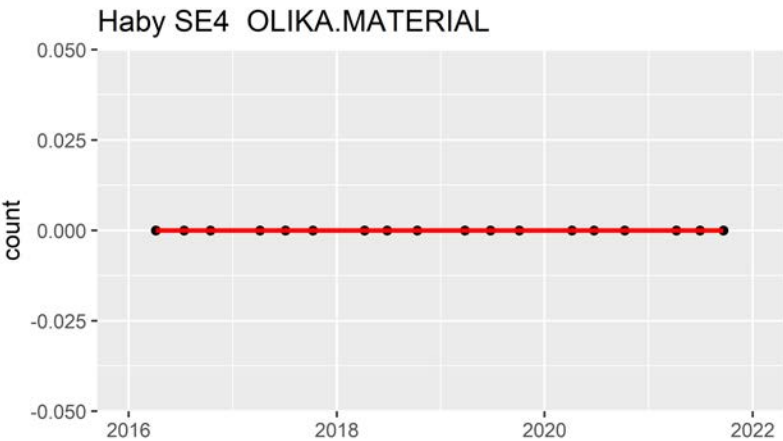
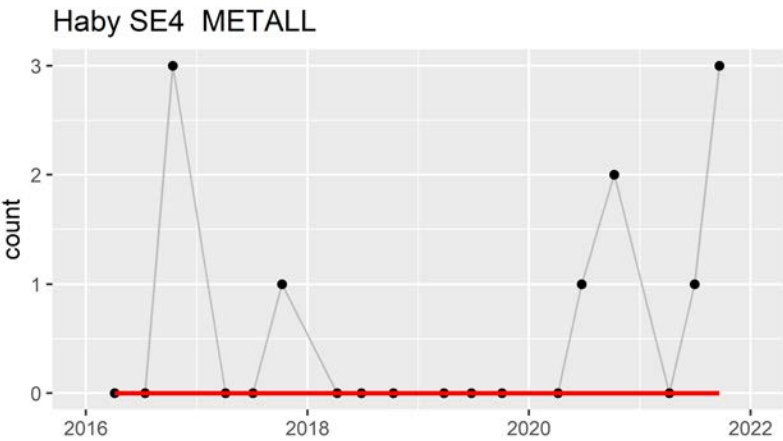
Gronevik Overon SE7 METALL



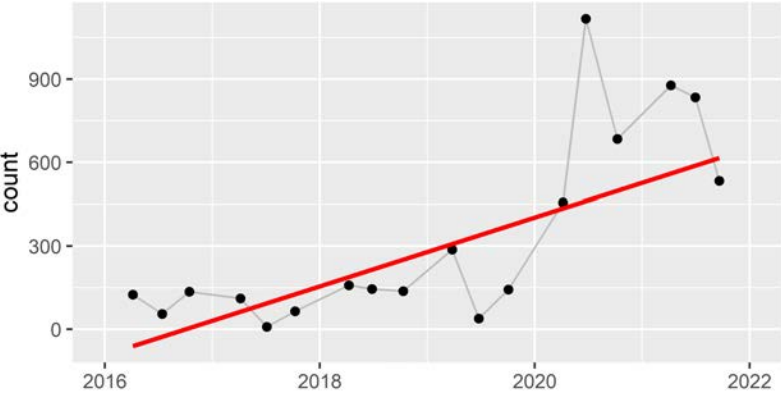




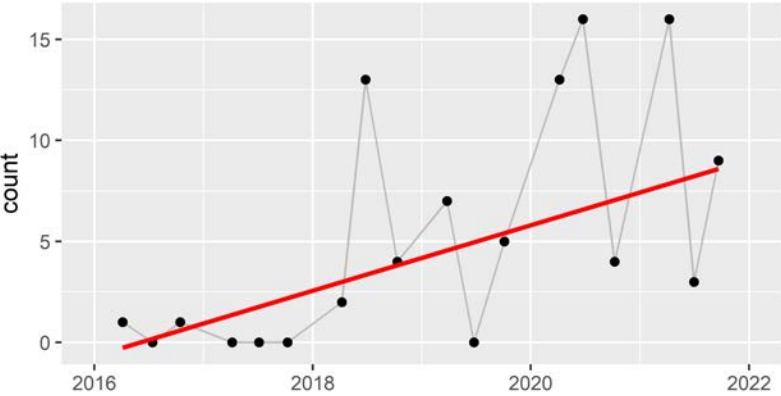




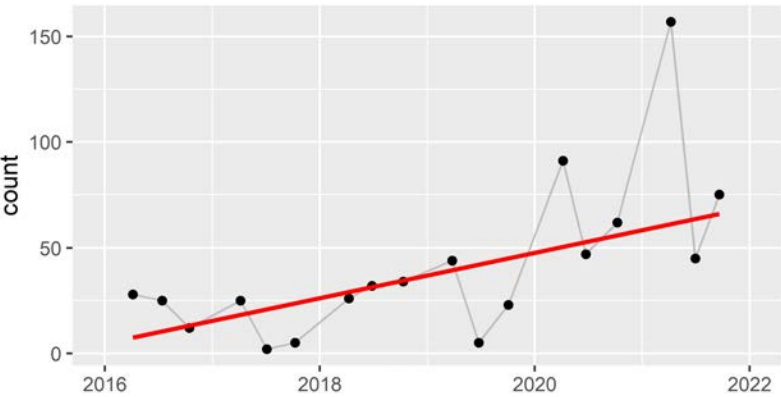
Haby SE4 PLAST



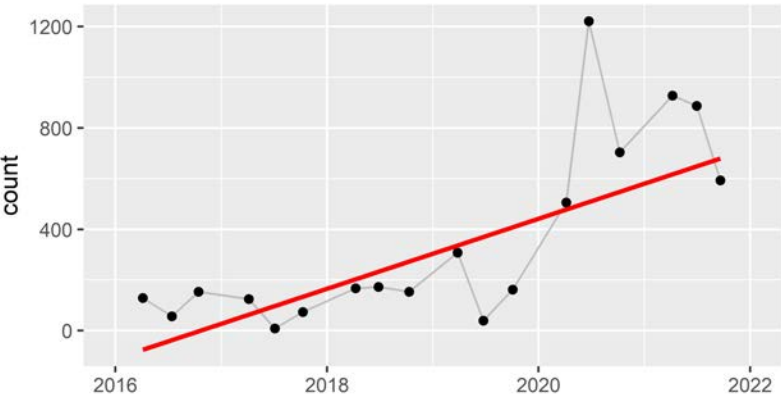
Haby SE4 SANITET.MEDICINSKT

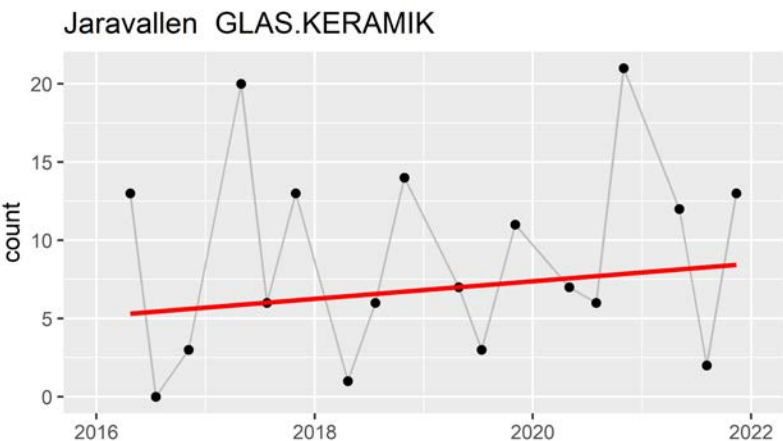
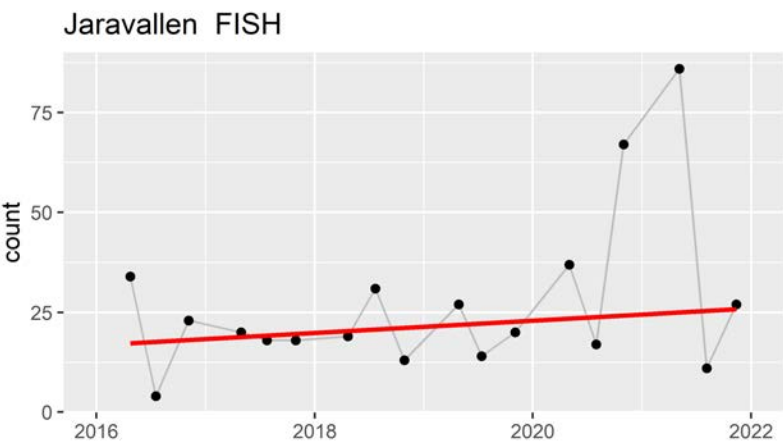
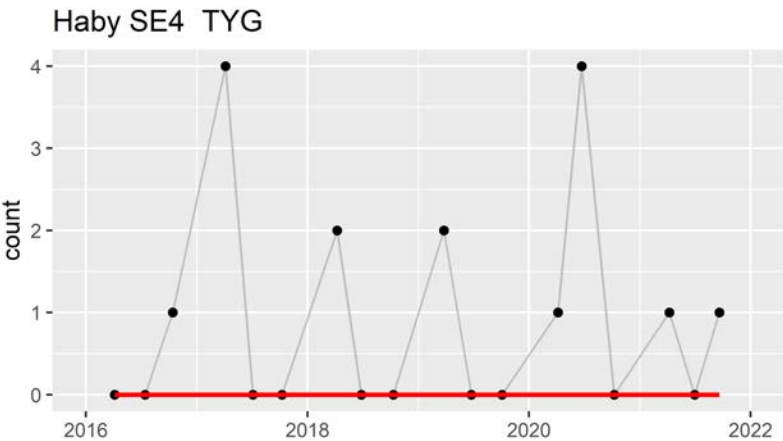
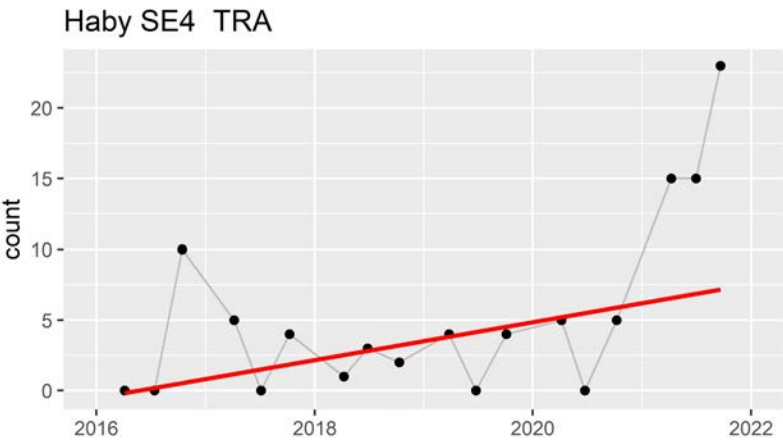


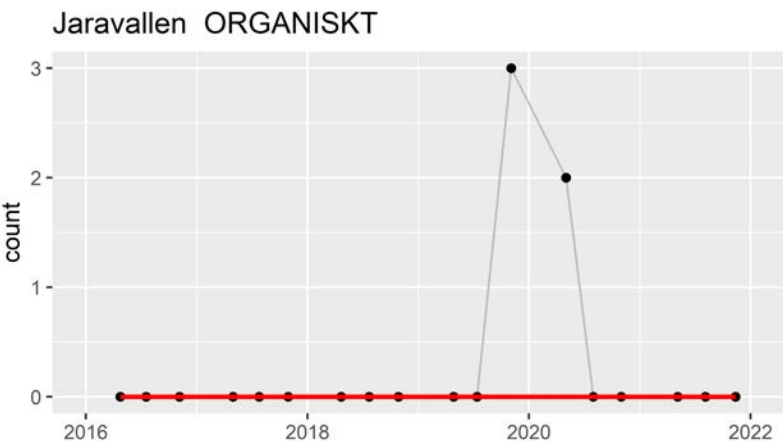
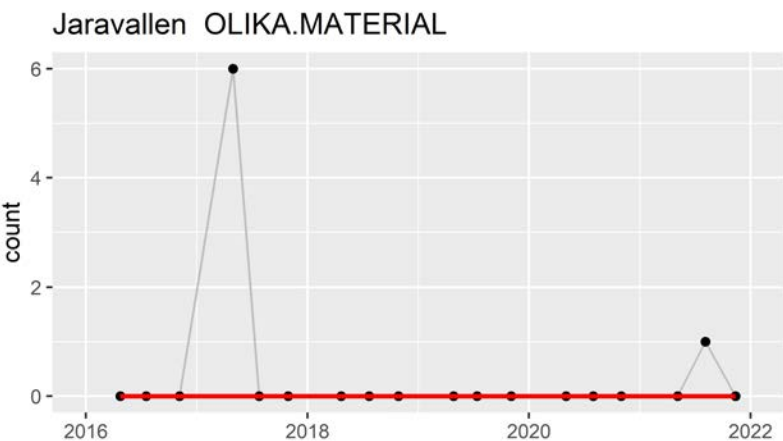
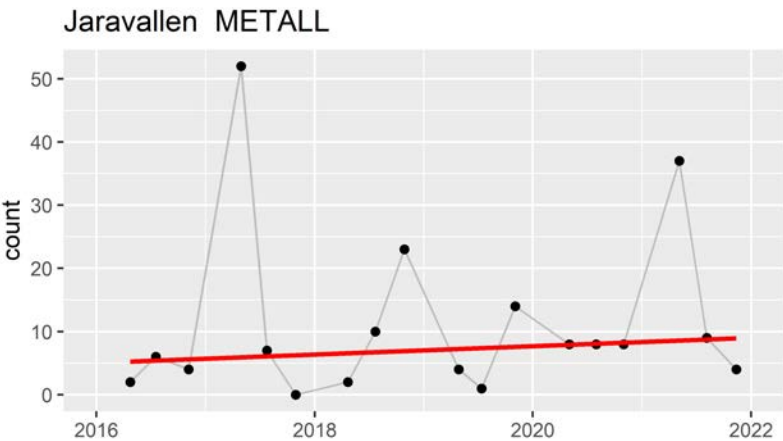
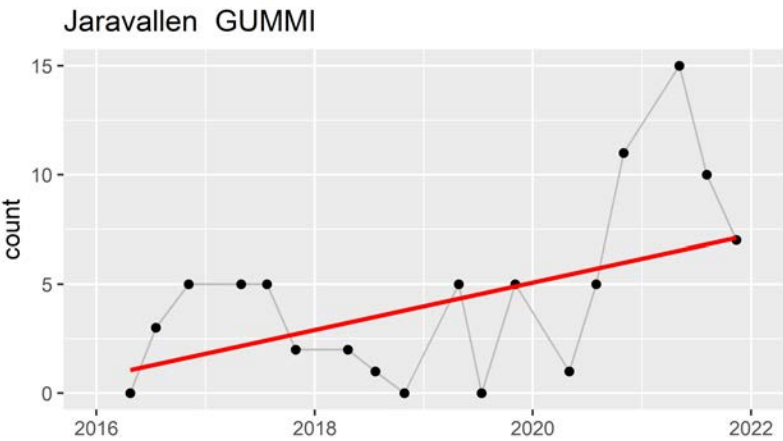
Haby SE4 SUP

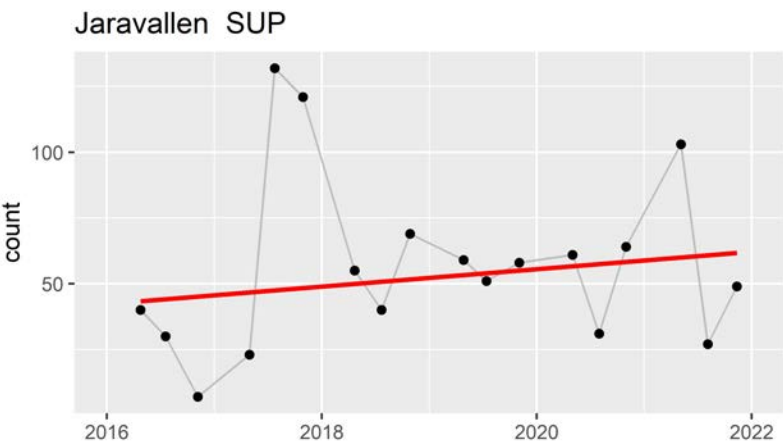
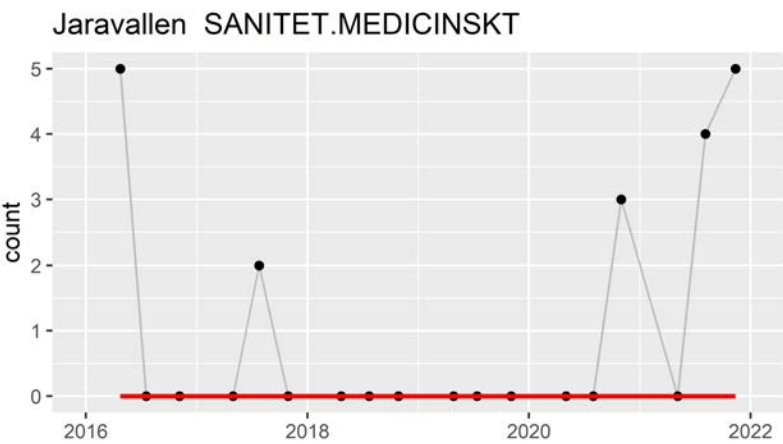
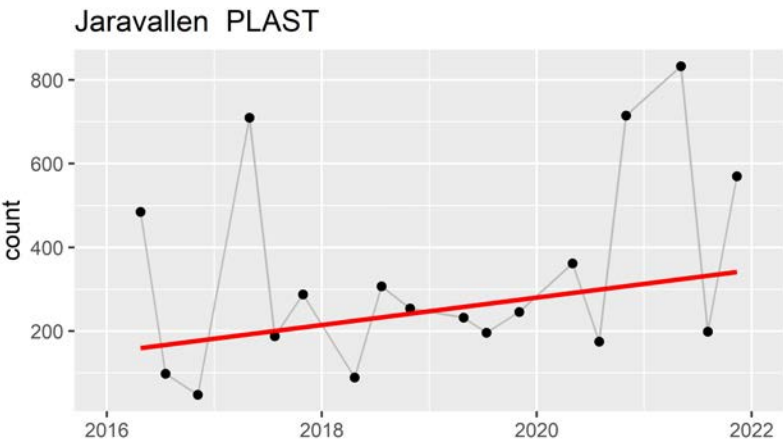
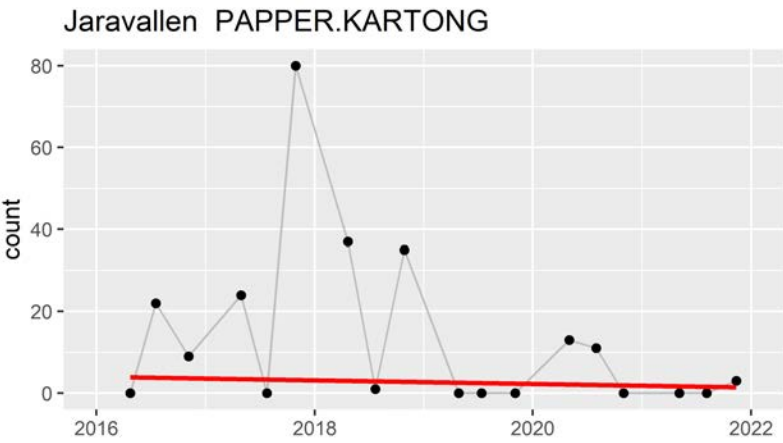


Haby SE4 TC

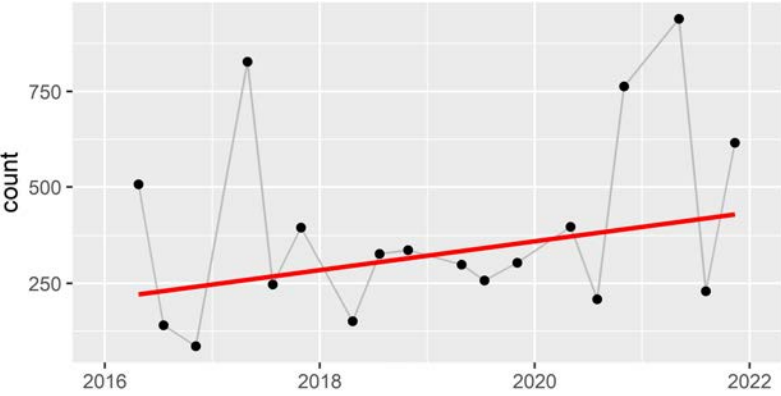




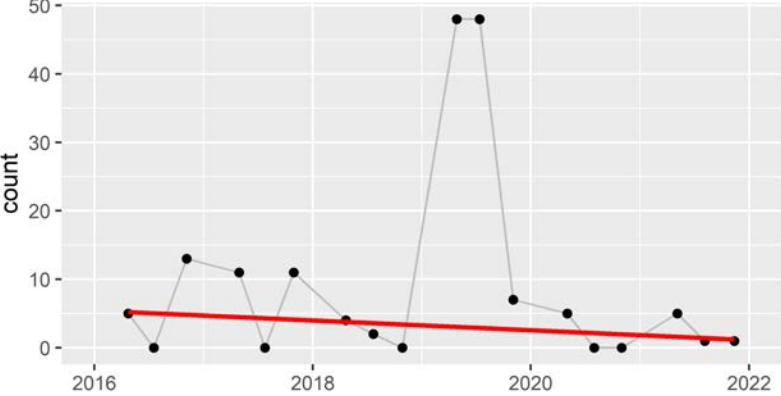




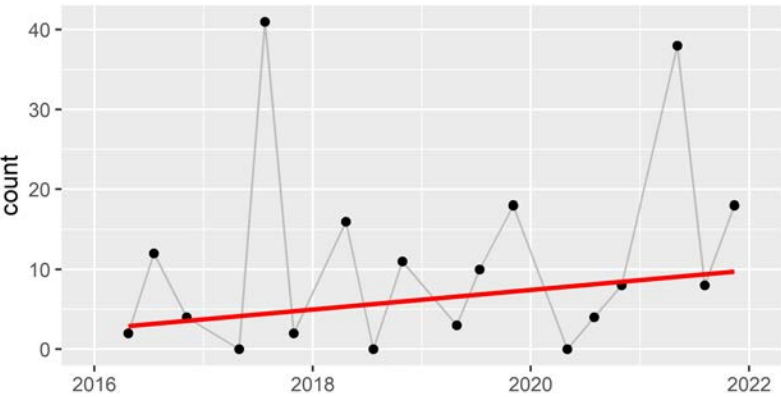
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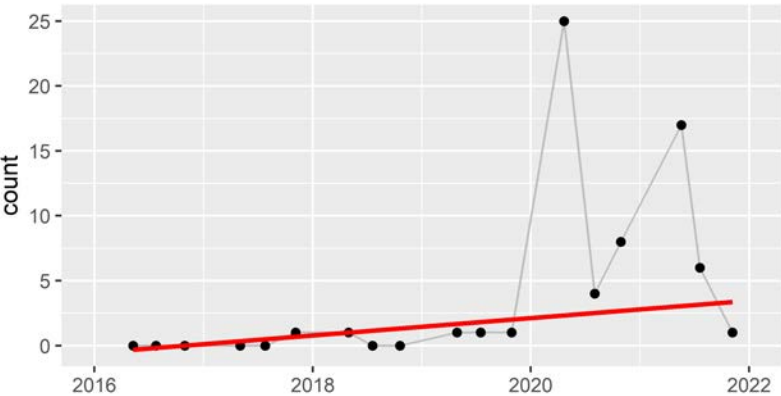
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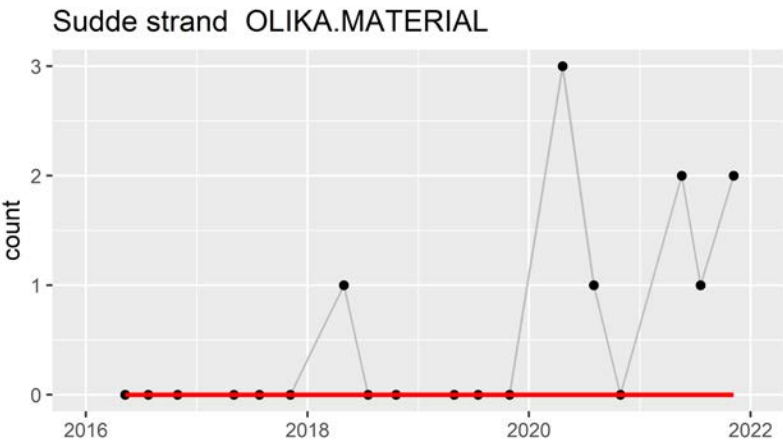
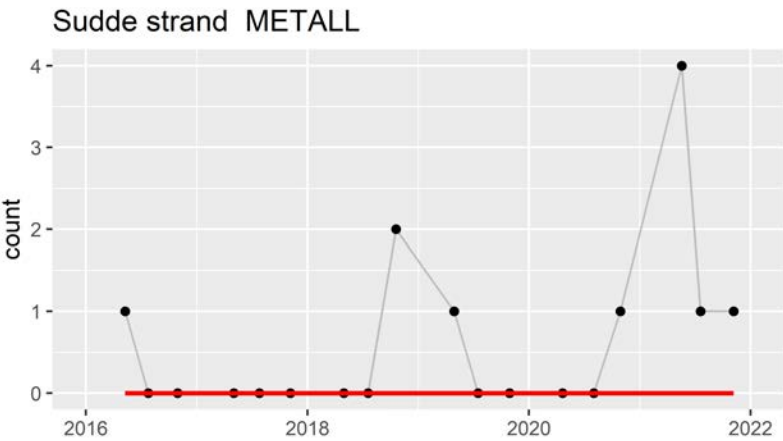
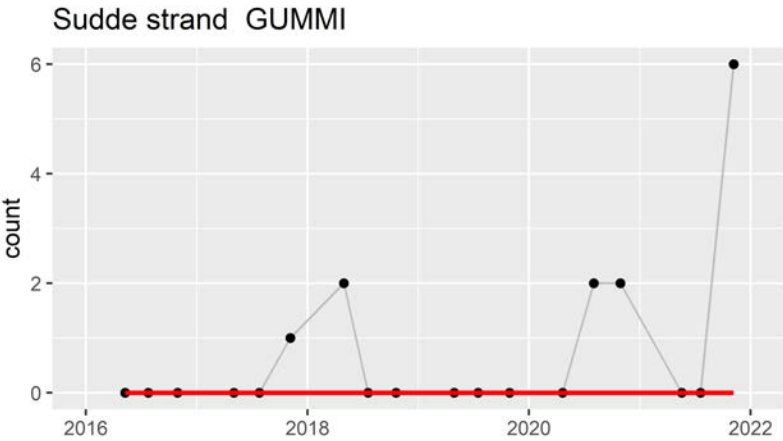
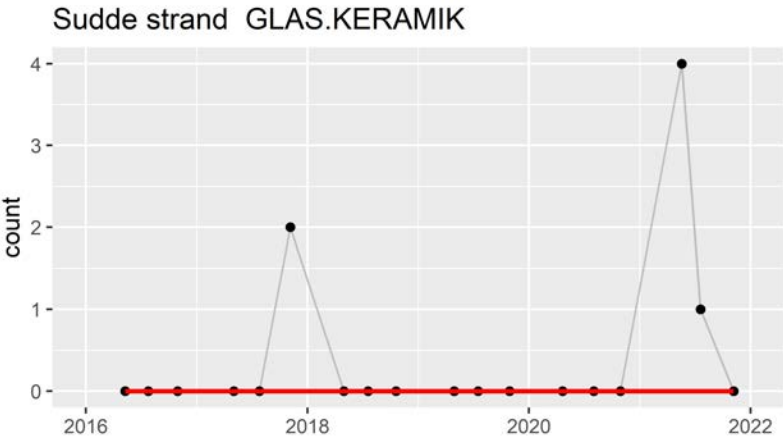


Jaravallen TYG

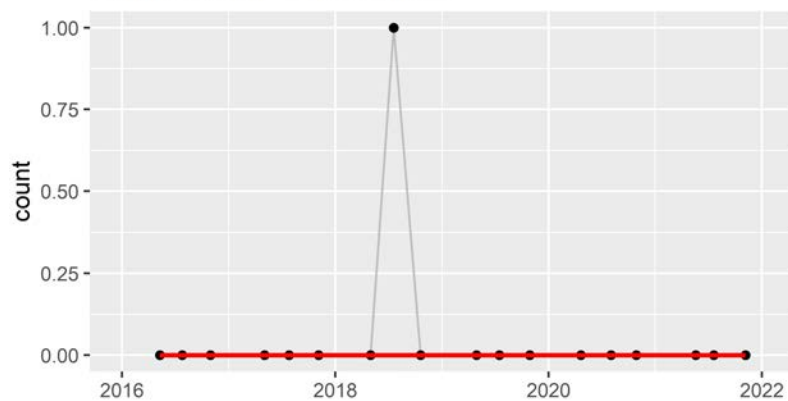


Sudde strand FISH

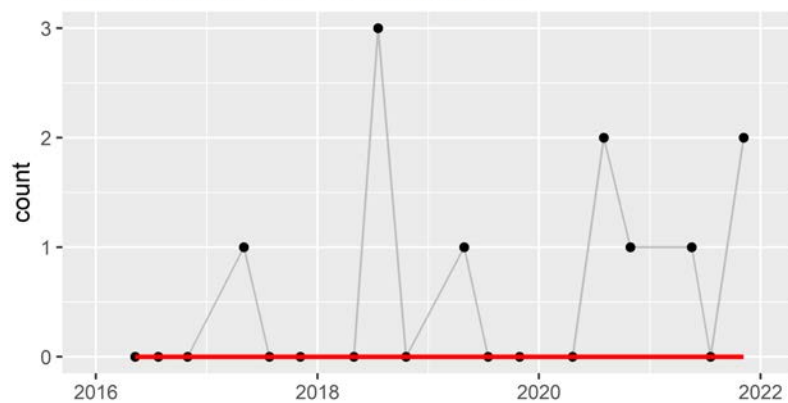




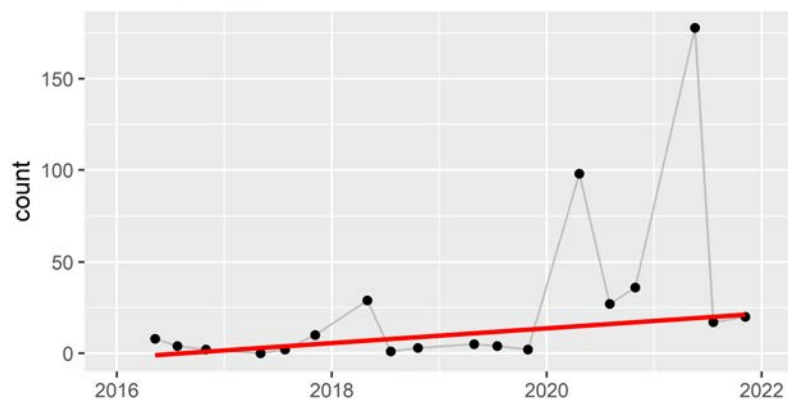
Sudde strand ORGANISKT



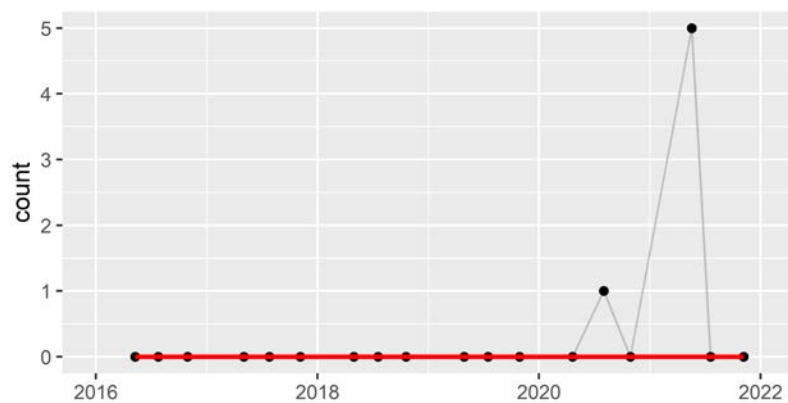
Sudde strand PAPPER.KARTONG



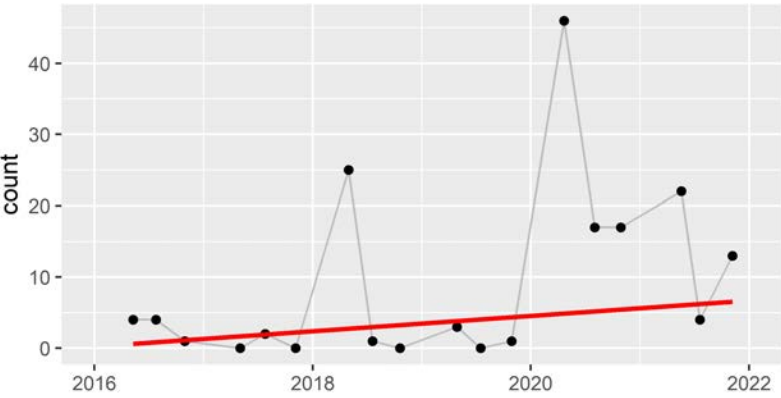
Sudde strand PLAST



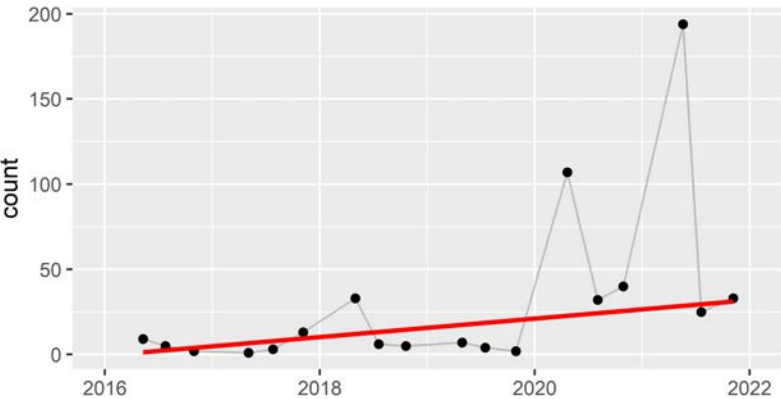
Sudde strand SANITET.MEDICINSKT



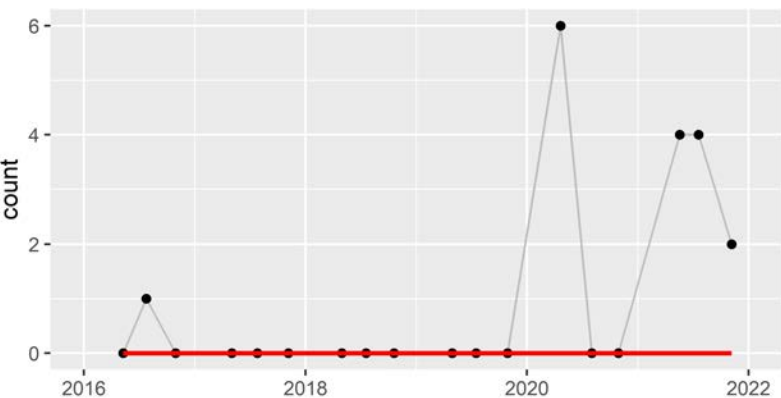
Sudde strand SUP



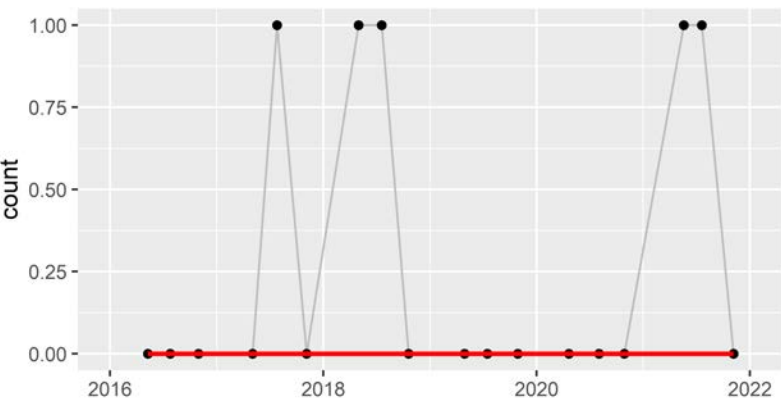
Sudde strand TC



Sudde strand TRA



Sudde strand TYG



Regional trend analysis

For each `region_code` and the type names and group codes specified in the settings file, the following statistics have been estimated for the period 2016-01-01 to 2021-12-31:

- the number of surveys (N);
- Theil-Sen slope: the median of all Theil-Sen slopes (https://en.wikipedia.org/wiki/Theil%E2%80%93Sen_estimator) within a region;
- p-value (<https://en.wikipedia.org/wiki/P-value>): the p-value associated with the one-tailed Regional Kendall test (Van Belle & Hughes, 1984 (<https://dx.doi.org/10.1029/WR020i001p00127>); Gilbert, 1987 (<https://www.osti.gov/biblio/7037501-statistical-methods-environmental-pollution-monitoring>)) to test the null hypothesis of
 - no monotonically *increasing* trend in case the regional Theil-Sen slope is greater than zero;
 - no monotonically *decreasing* trend in case the regional Theil-Sen slope is smaller than zero;

A p-value less than an *a priori* specified significance level (https://en.wikipedia.org/wiki/Statistical_significance) (e.g., often $\alpha = 0.05$), indicates a significant trend. If the p-value is greater than this significance level, we can't say that there is no trend. We can only conclude that our data do not show evidence for a significant trend (due to lack of data, noise, etc.).

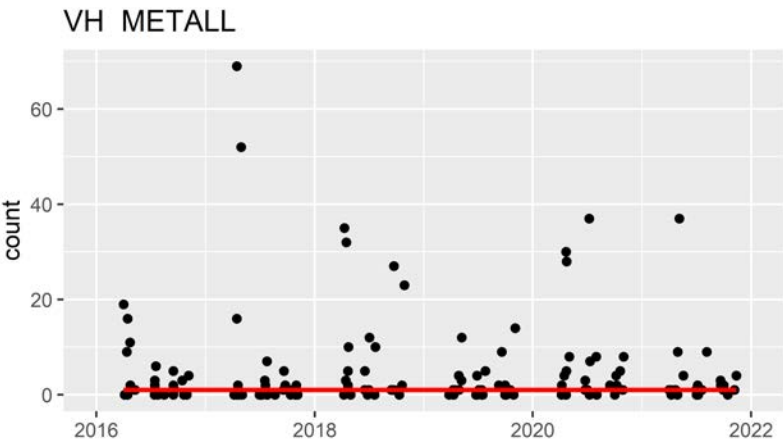
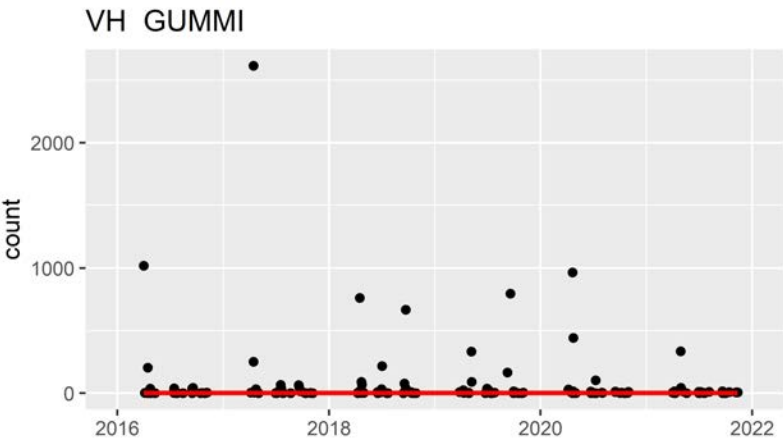
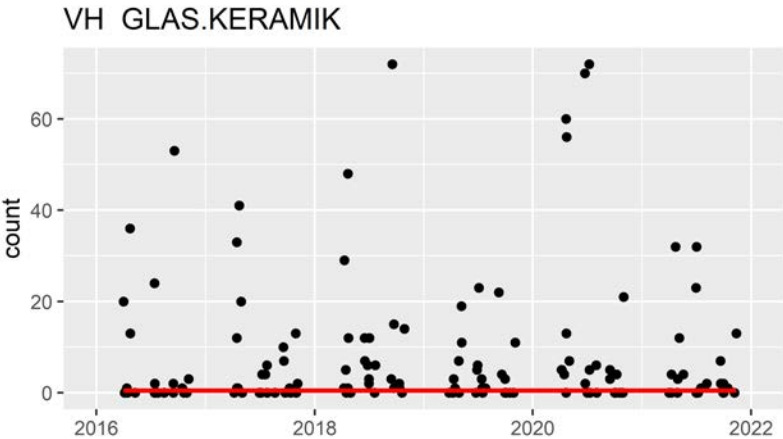
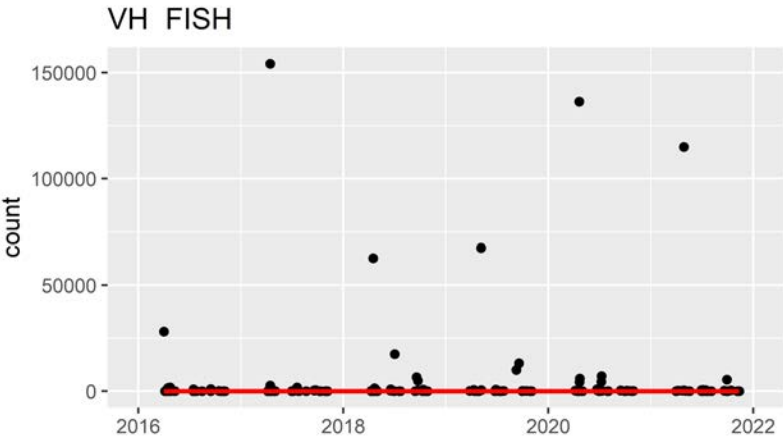
The Regional Kendall test is a non-parametric test and as such does not make distributional assumptions on the data.

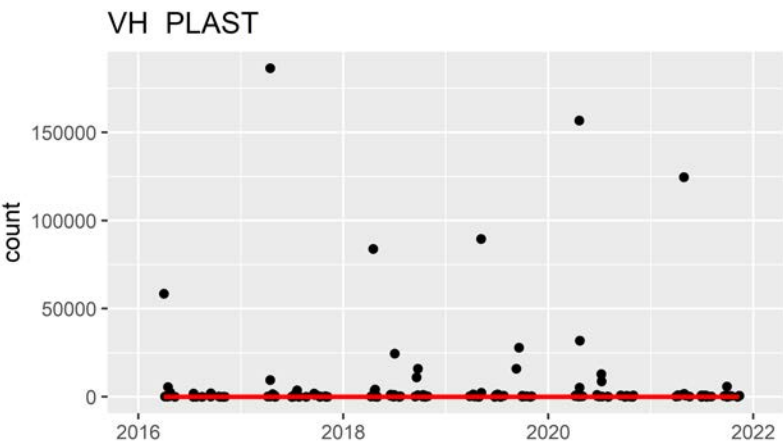
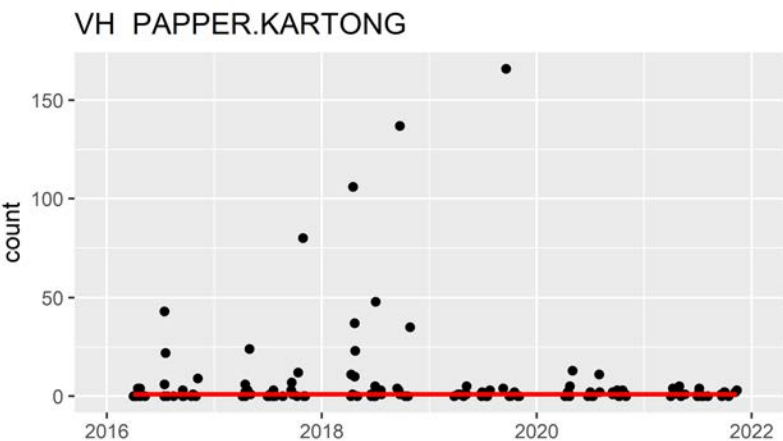
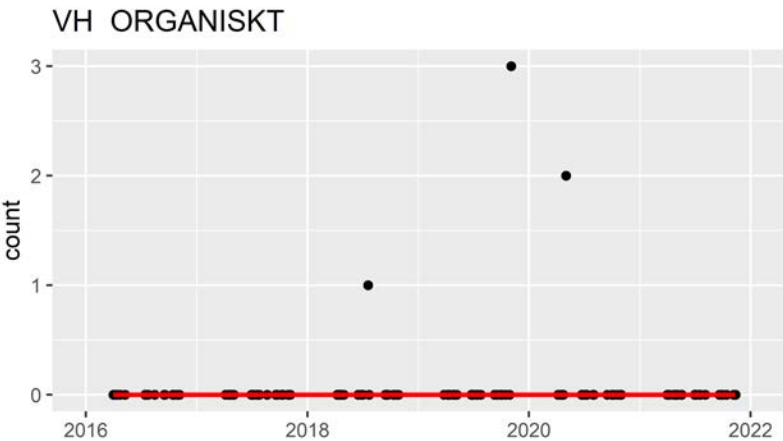
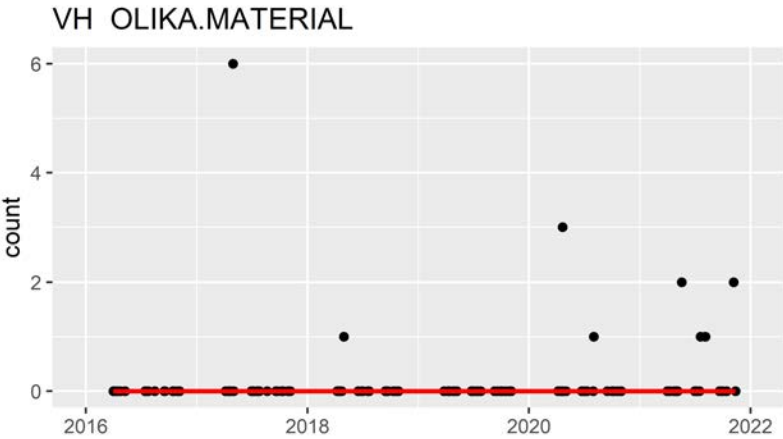
Note that the trend statistics can only be computed if all `location_code`s of a `region_code` have at least three records (surveys). If that is not the case, the table below contains NA.

region_code	type name / group code	N	slope	p-value
VH	TC	143	-5.374	0.8282
VH	PLAST	143	-5.121	0.8282
VH	SUP	143	-3.748	0.6172
VH	FISH	143	-1.203	0.9329
VH	TRA	143	-0.6439	0.3839
VH	GLAS.KERAMIK	143	0	0.7695
VH	GUMMI	143	0	0.6782
VH	METALL	143	0	0.8581
VH	OLIKA.MATERIAL	143	0	0.9880
VH	ORGANISKT	143	0	0.6542
VH	PAPPER.KARTONG	143	0	0.3163
VH	SANITET.MEDICINSKT	143	0	0.6945
VH	TYG	143	0	0.0260

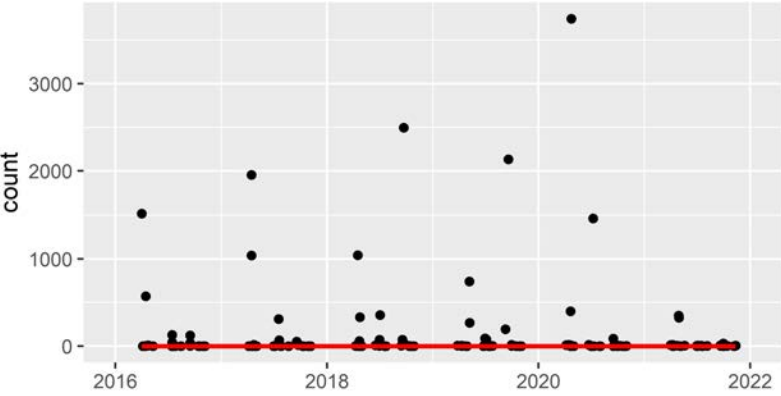
Time-series of the selected type names and group codes are given for the selected regions in the plots below (see also Settings). The lines and dots have the following meaning:

- coloured dots: observations;
- red line: Regional Theil-Sen trend line (its slope is given in the table above). Note that the trend line (red line) is only given in case there are at least three records (surveys) in each `location_code` to estimate the trend parameters.

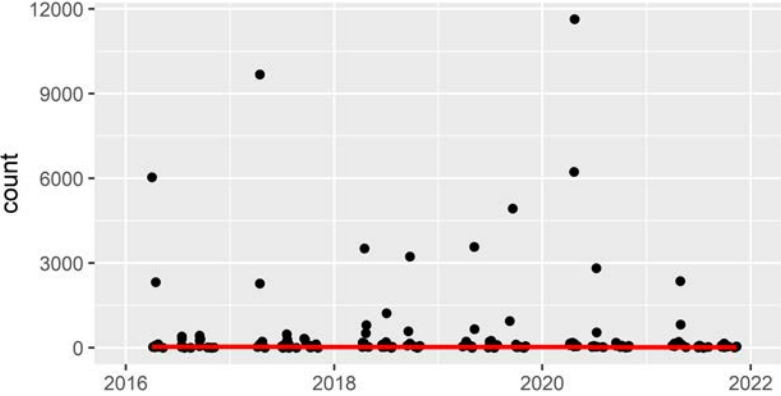




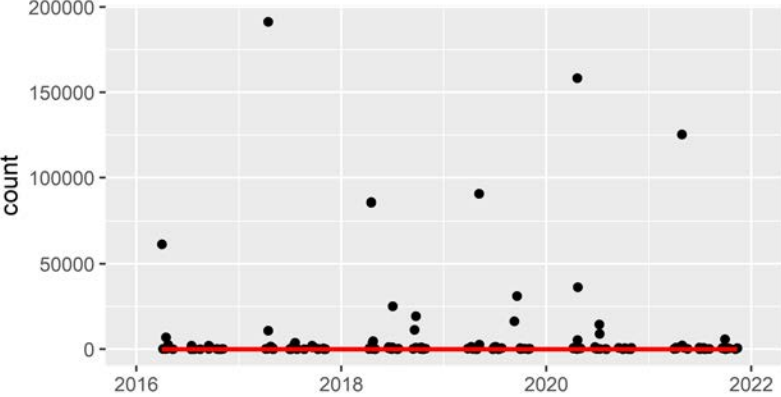
VH SANITET.MEDICINSKT

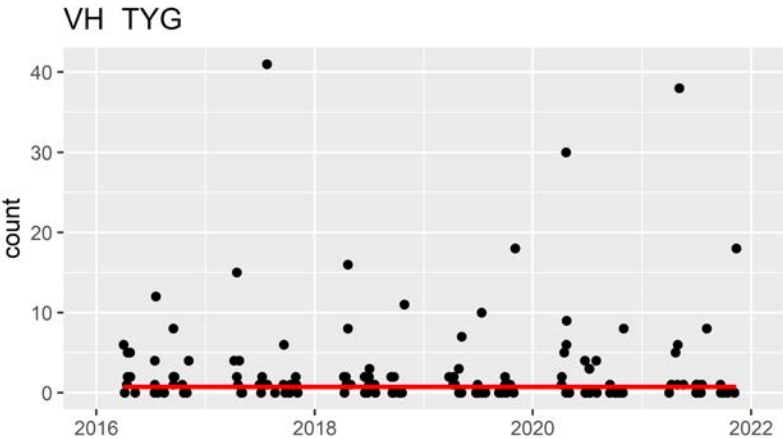
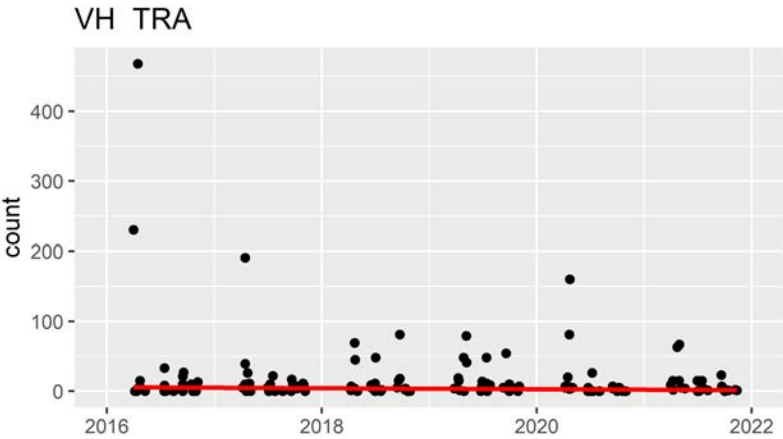


VH SUP



VH TC





Session Information

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R version 4.2.2 (2022-10-31 ucrt)
Platform: x86_64-w64-mingw32/x64 (64-bit)
Running under: Windows 10 x64 (build 22621)
```

```
Matrix products: default
```

```
locale:
```

```
[1] LC_COLLATE=Swedish_Sweden.utf8  LC_CTYPE=Swedish_Sweden.utf8
[3] LC_MONETARY=Swedish_Sweden.utf8 LC_NUMERIC=C
[5] LC_TIME=Swedish_Sweden.utf8
```

```
attached base packages:
```

```
[1] stats      graphics  grDevices  utils      datasets  methods    base
```

```
other attached packages:
```

```
[1] stringr_1.4.1   readr_2.1.3     knitr_1.40      fs_1.5.2        ggplot2_3.4.0
[6] tidyr_1.2.1     purrr_0.3.5     dplyr_1.0.10    rlang_1.0.6     litteR_1.0.0
[11] openxlsx_4.2.5.1
```

```
loaded via a namespace (and not attached):
```

```
[1] tidyselect_1.2.0 xfun_0.34      bslib_0.4.1    lattice_0.20-45 splines_4.2.2
[6] tcltk_4.2.2      colorspace_2.0-3 vctrs_0.5.0    generics_0.1.3  htmltools_0.5.3
[11] mgcv_1.8-41      yaml_2.3.6     utf8_1.2.2     pillar_1.8.1    jquerylib_0.1.4
[16] glue_1.6.2       withr_2.5.0    bit64_4.0.5    lifecycle_1.0.3 munsell_0.5.0
[21] gtable_0.3.1     zip_2.2.2      evaluate_0.18  labeling_0.4.2  tzdb_0.3.0
[26] fastmap_1.1.0    parallel_4.2.2 fansi_1.0.3     highr_0.9       Rcpp_1.0.9
[31] scales_1.2.1     cachem_1.0.6   vroom_1.6.0    jsonlite_1.8.3  farver_2.1.1
[36] bit_4.0.4        hms_1.1.2      digest_0.6.30  stringi_1.7.8   grid_4.2.2
[41] cli_3.4.1        tools_4.2.2    magrittr_2.0.3 sass_0.4.2      tibble_3.1.8
[46] crayon_1.5.2     pkgconfig_2.0.3 Matrix_1.5-1    ellipsis_0.3.2  rmarkdown_2.18
[51] R6_2.5.1         nlme_3.1-160   compiler_4.2.2
```