



Hans Hagen Stockhausen og Kjell Nedreaas

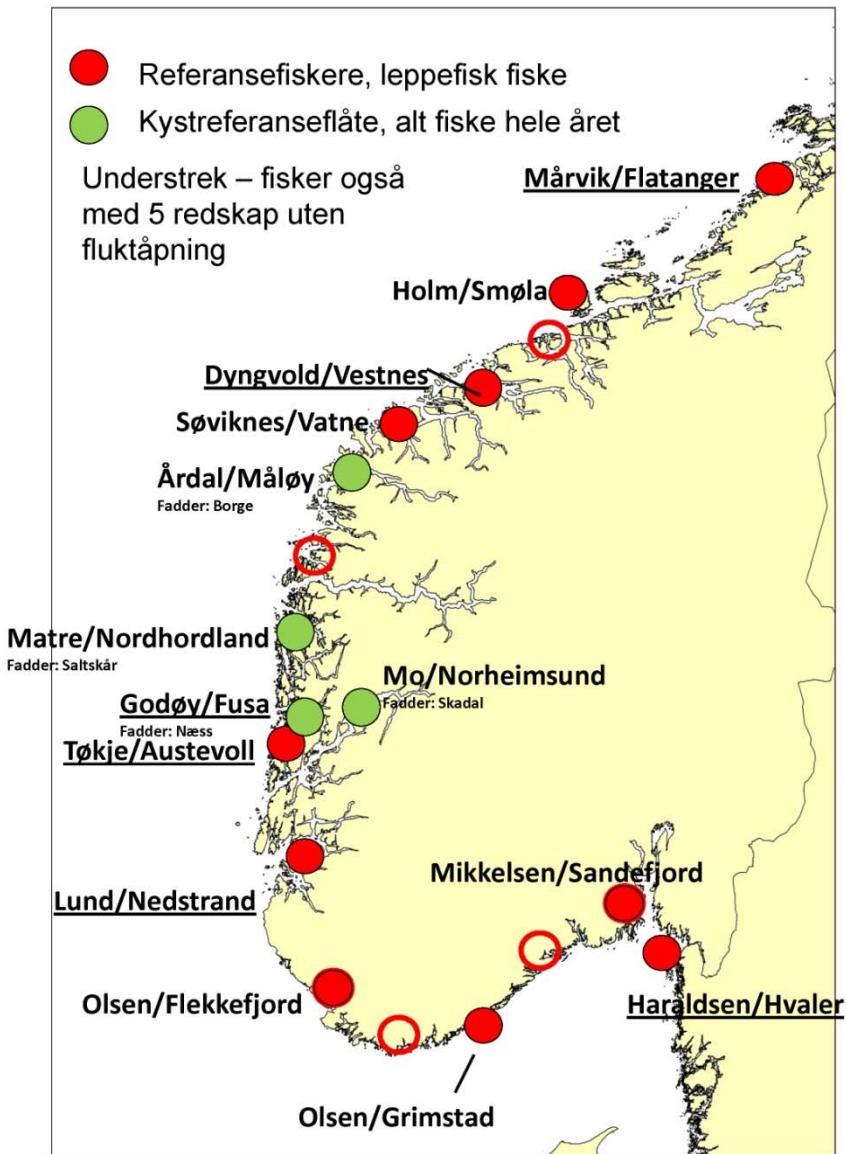
Takk!

- Takk til alle dere som deltar og bidrar!
- Stor takk til alle som rapporterer hyppigere enn avtalt.
- Stor takk til alle som rapporterer veldig detaljert (GPS, nyttig informasjon i fritekst, andre arter...)
- Veldig stort takk til alle som har vært med i flere år – dette er særlig verdifullt!

Konklusjoner

- Hovedkonklusjonene om CPUE verdiene (fangst-per-teine- eller rusedøgn) fra tidligere år:
 - Store CPUE variasjoner mellom artene.
 - Store CPUE variasjoner mellom forskjellige landsdeler (nord / sør; innenfor en art).
 - Begrensete variasjoner / få trender i løpet av sesongen (per art og sted).

Referansefiskere (& deler av kystreferanseflåten) 2016



Resultater for sesongen 2016

- Fangsttallene: bifangst & leppefisk. Søylediagrammer – husk at øylene for antall beholdt og utsatt fangst er stablet.
- CPUE for leppefisk artene.
- Med fluktåpning / uten fluktåpning
- sortert nord til sør
- Tidsaksen: dagsnummer (sesong 2016: dag 180 – 280)

Jul 2016: 183 – 213

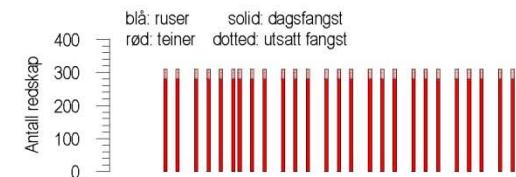
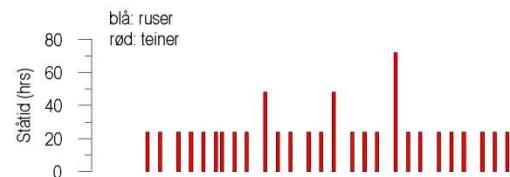
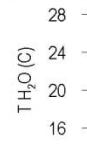
Aug 2016: 214 – 244

Sep 2016: 245 – 274

Mårvik 2016

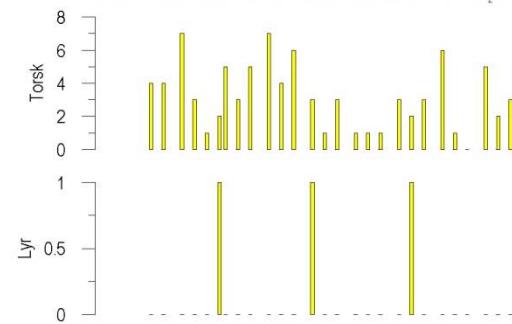
med flukåpning

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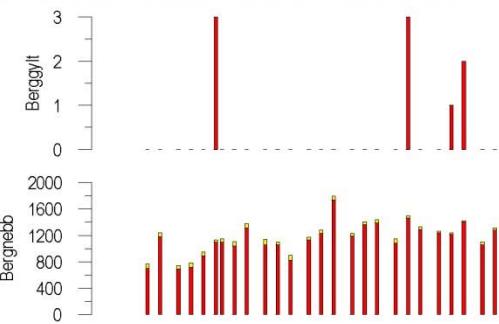


blå: antall beholdt RUSER
 grønn: antall utsatt RUSER

[NB: "Teiner" and "Ruser" bar charts are individually stacked, but "Teiner" bars in front of "Ruser" bars and are thus not stacked on top of "Ruser" columns. "Teiner" bars are thinner than "Ruser" bars]

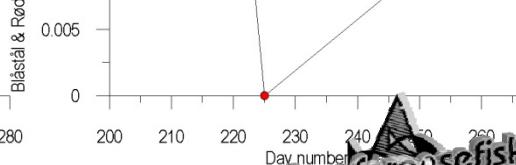
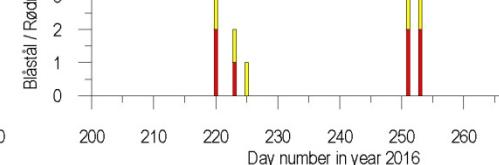
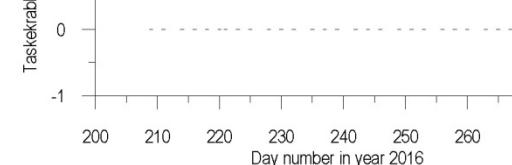
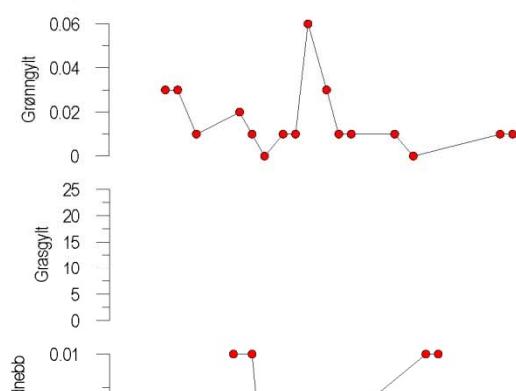
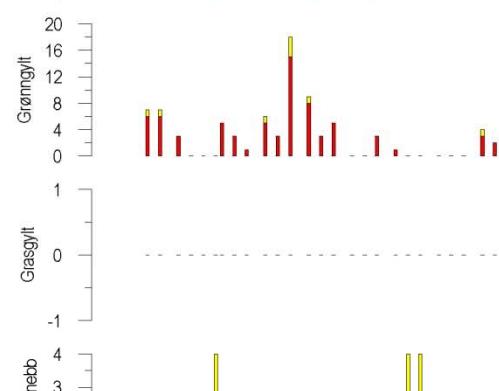
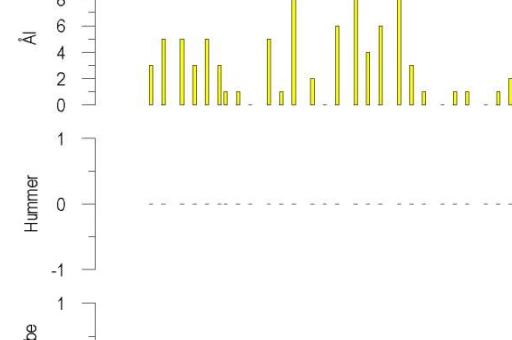
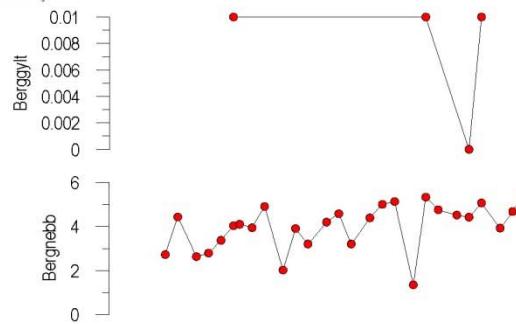


rød: antall beholdt TEINER
 gul: antall utsatt TEINER



CPUE

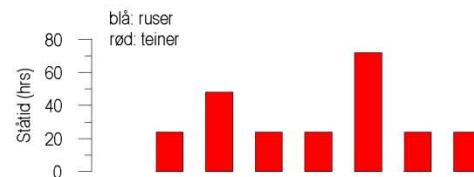
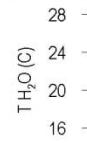
[N/gear og døgn]



Mørvik 2016

utan flukåpning

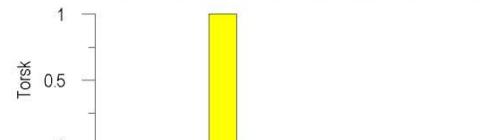
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blå: antall beholdt RUSER
 grønn: antall utsatt RUSER

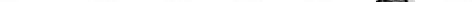
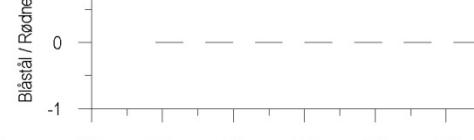
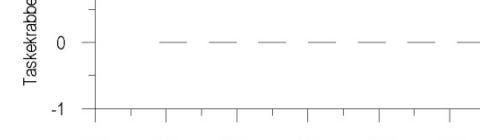
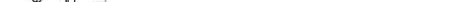
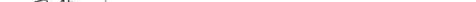
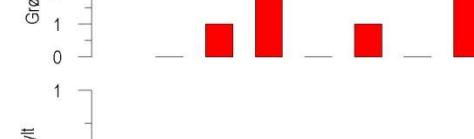
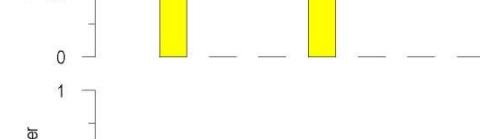
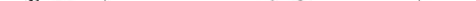
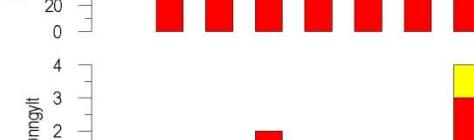
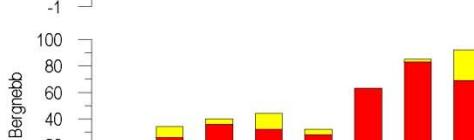
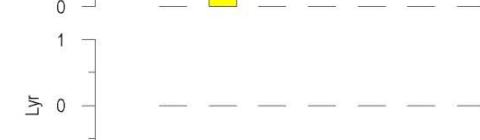
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rød: antall beholdt TEINER
 gul: antall utsatt TEINER



CPUE

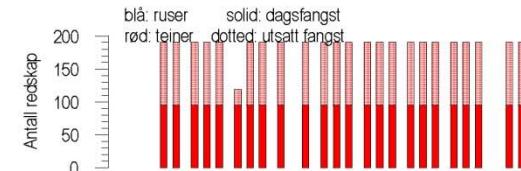
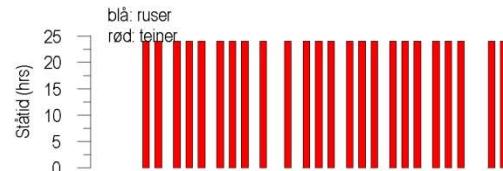
[N/gear og døgn]



Holm 2016 med flukåpning



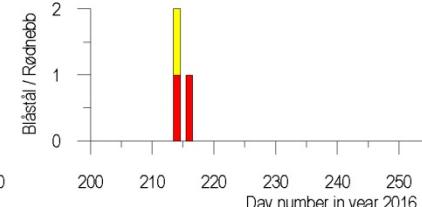
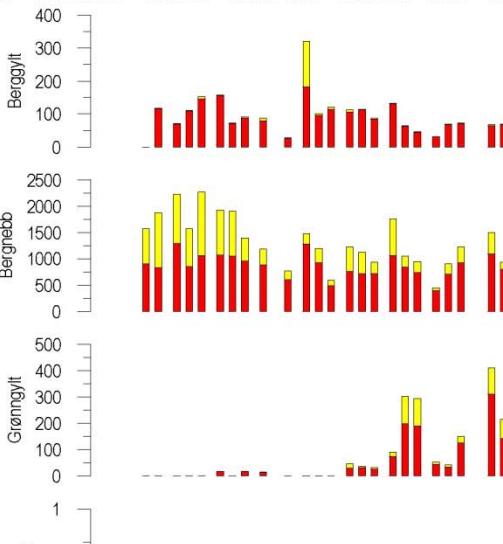
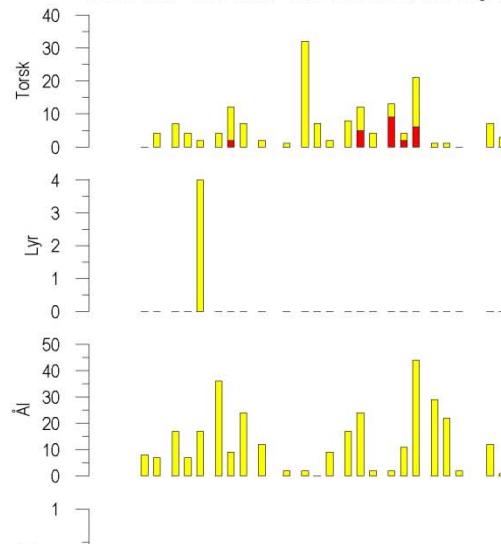
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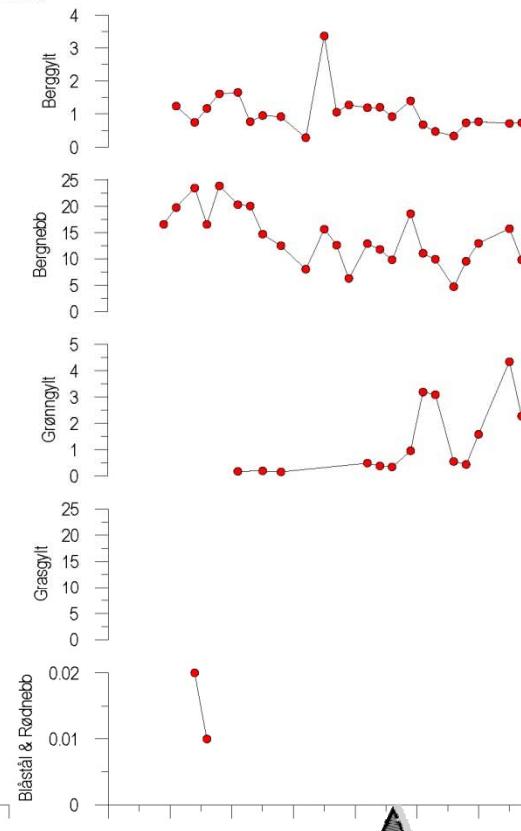
blå: antall beholdt RUSER
grønn: antall utsatt RUSER

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gul: antall utsatt TEINER



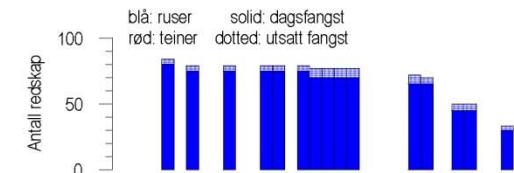
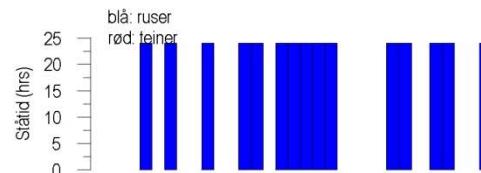
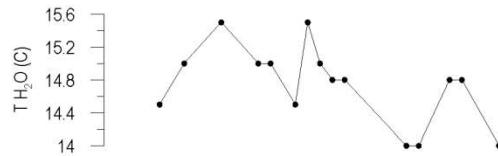
CPUE
[N/gear og døgn]



Dyngvold2016

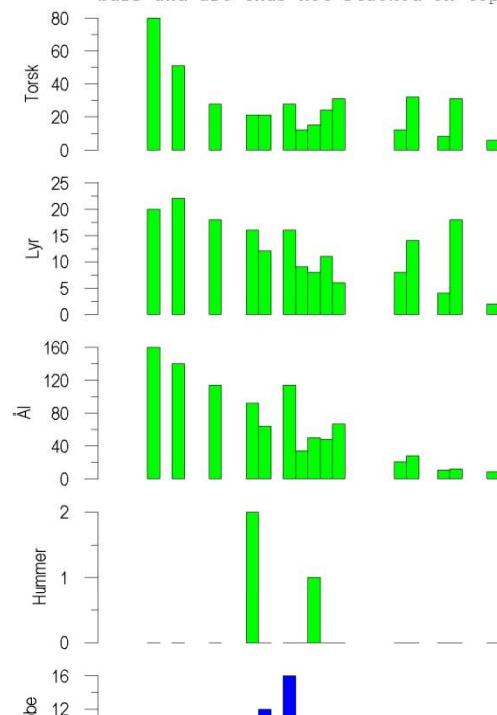
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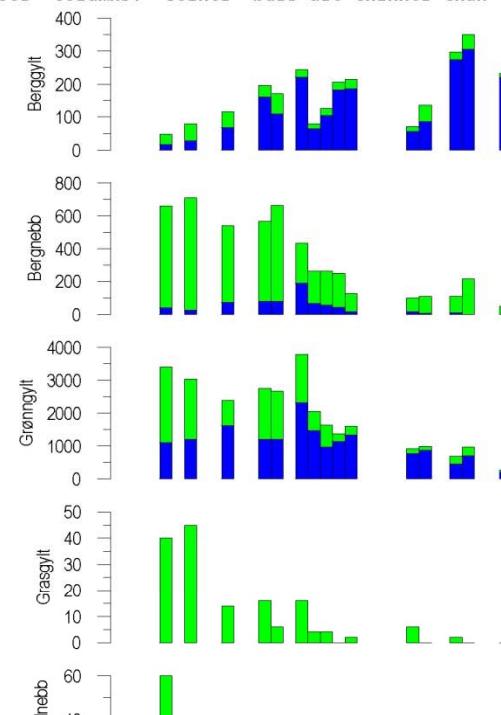
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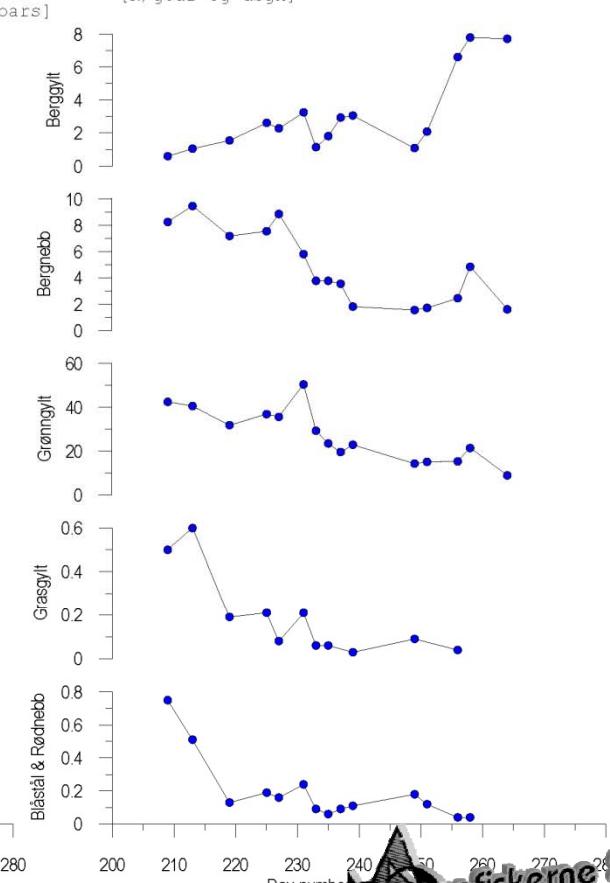
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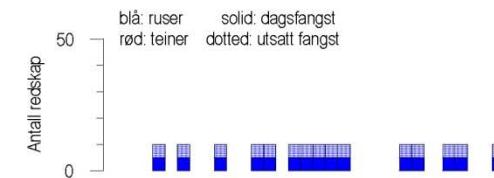
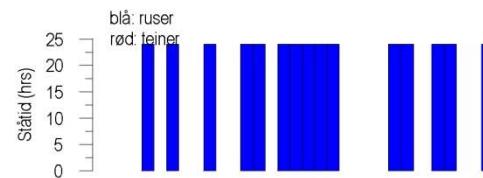
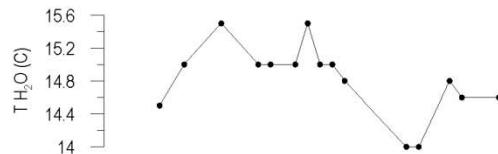
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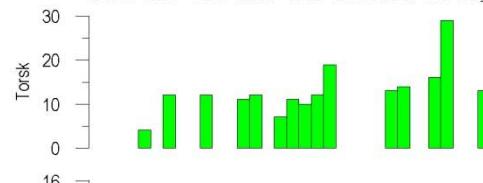
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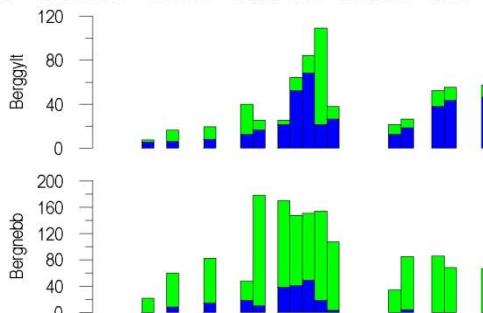


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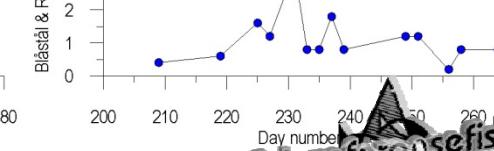
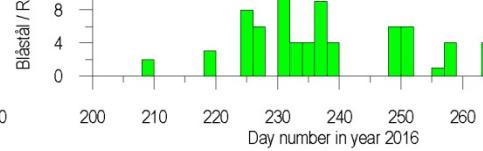
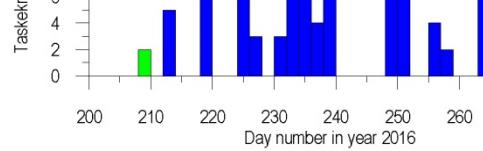
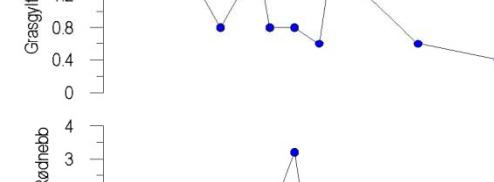
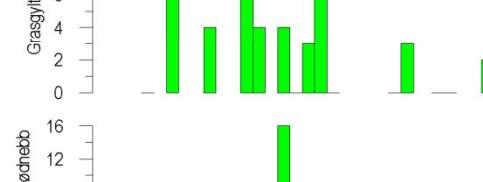
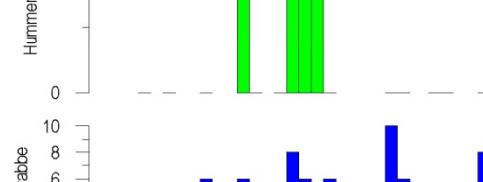
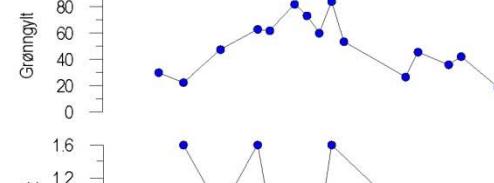
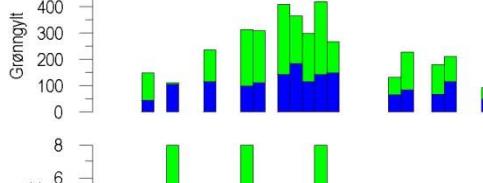
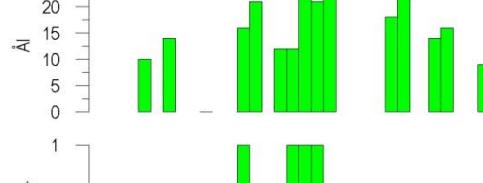
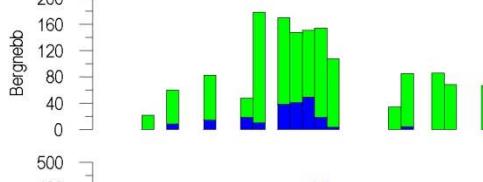
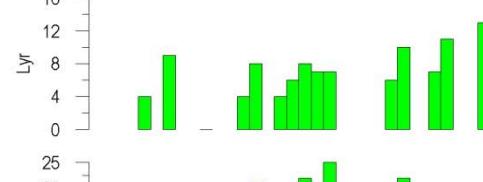
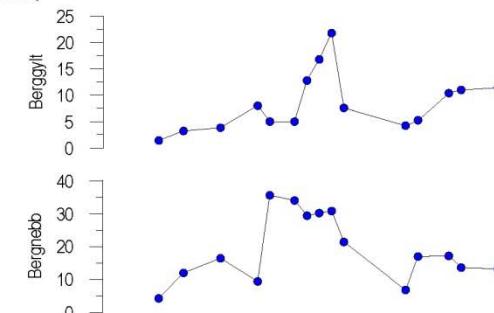


rød: antall beholdt TEINER
 gul: antall utsatt TEINER



CPUE

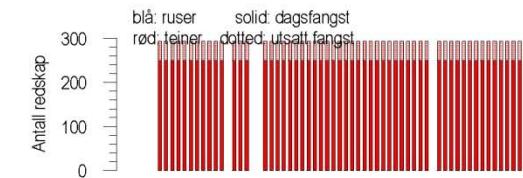
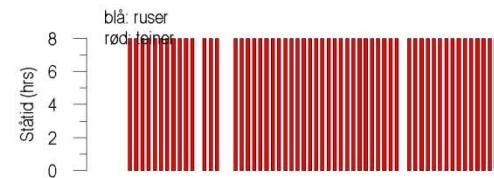
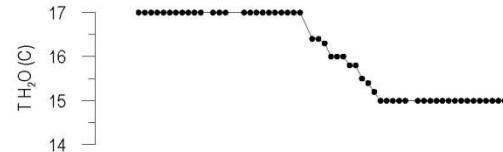
[N/gear og døgn]



Søviknes²⁰¹⁶

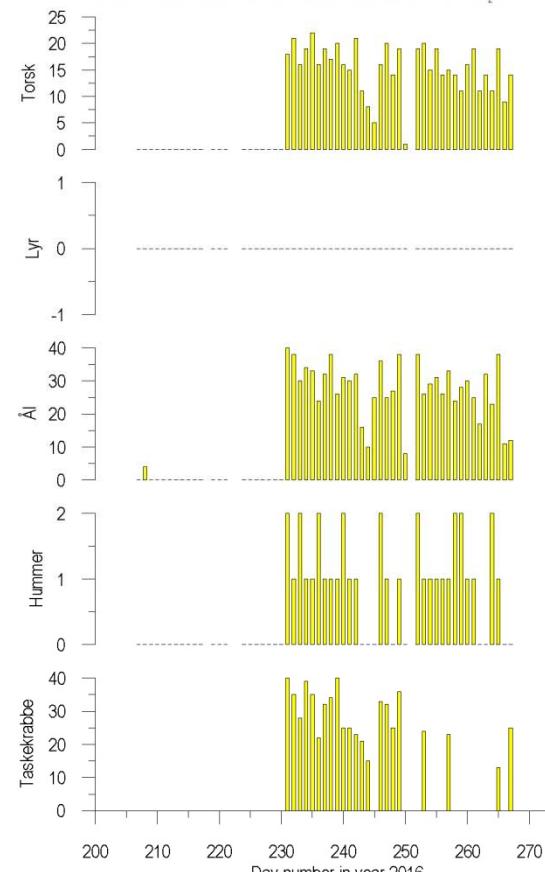
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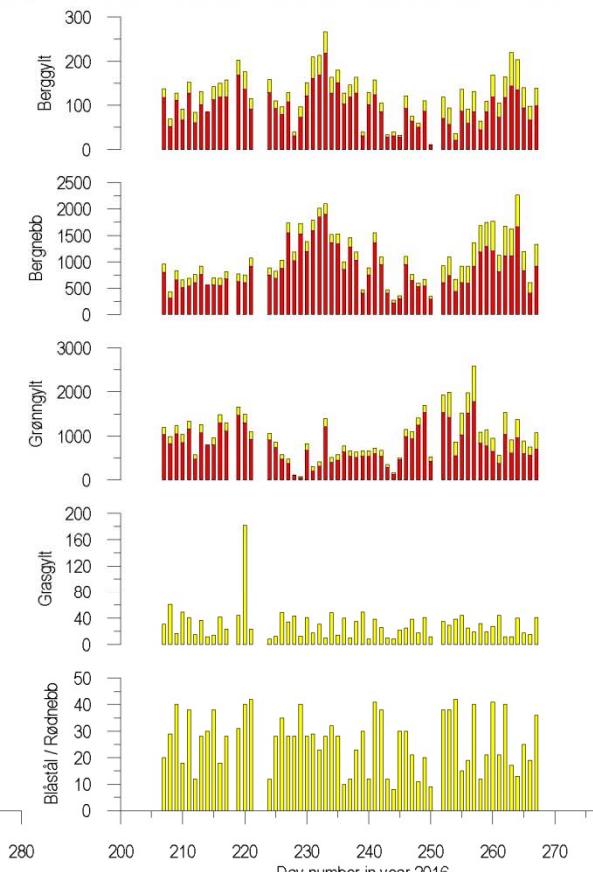
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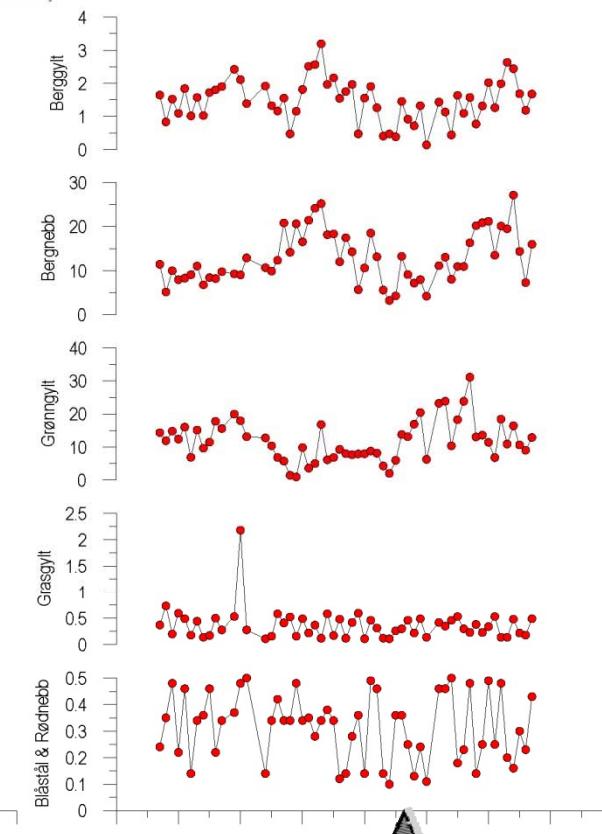
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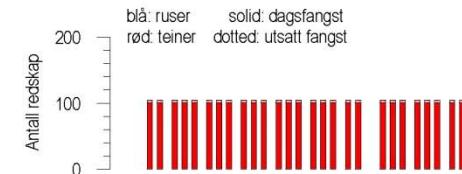
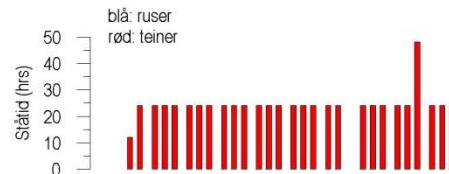
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Tøkje²⁰¹⁶

med flukåping

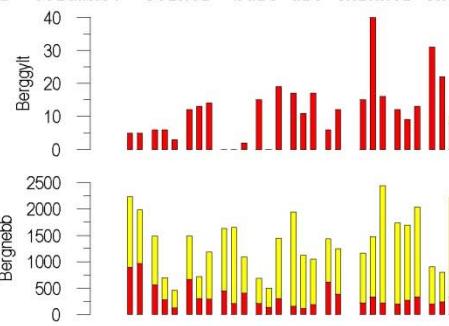
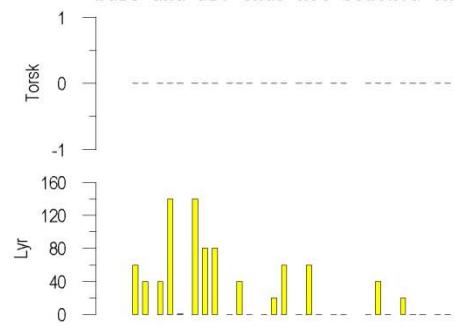
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blå: antall beholdt RUSER
grønn: antall utsatt RUSER

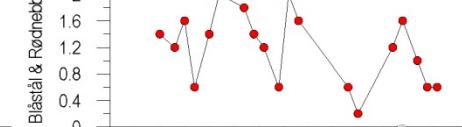
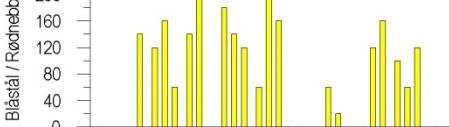
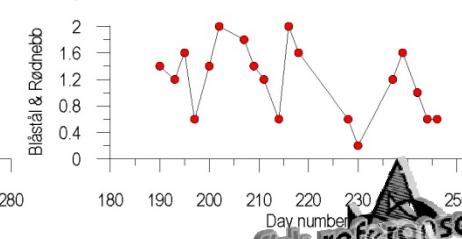
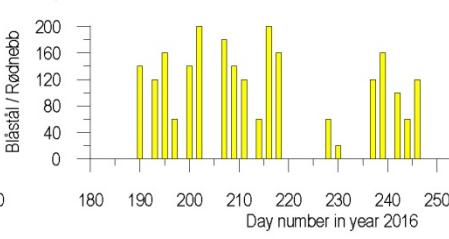
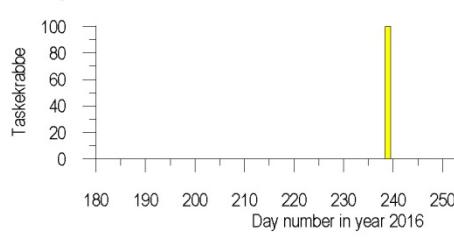
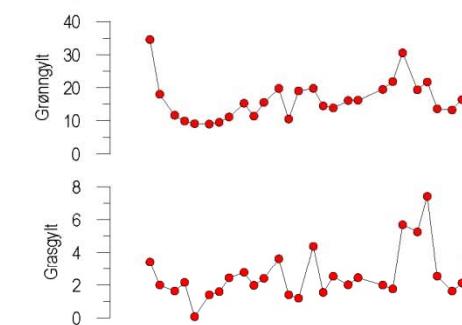
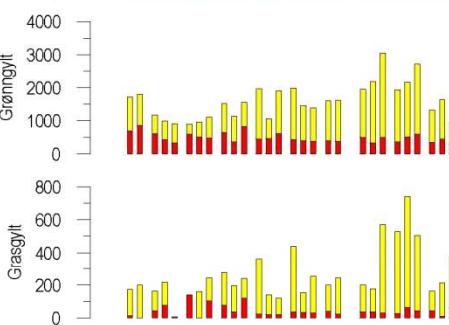
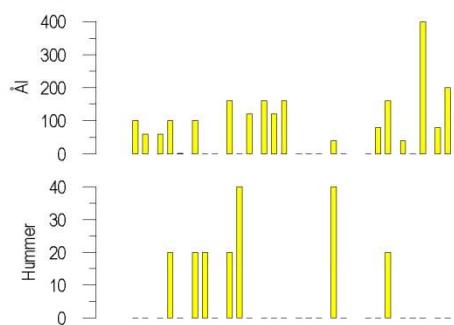
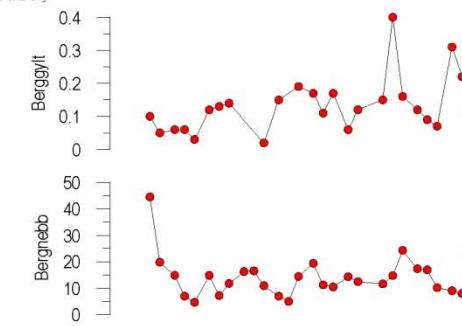
[NB: "Teiner" and "Ruser" bar charts are individually stacked, but "Teiner" bars are in front of "Ruser" bars and are thus not stacked on top of "Ruser" columns. "Teiner" bars are thinner than "Ruser" bars]

rød: antall beholdt TEINER
gul: antall utsatt TEINER



CPUE

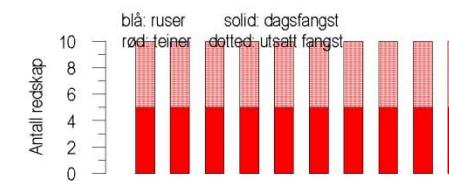
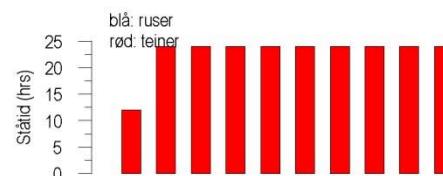
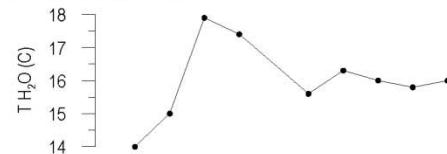
[N/gear og døgn]



Tøkje2016

utan flukåpning

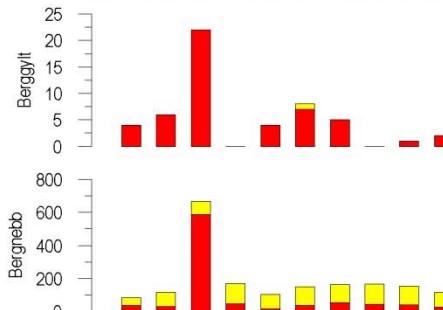
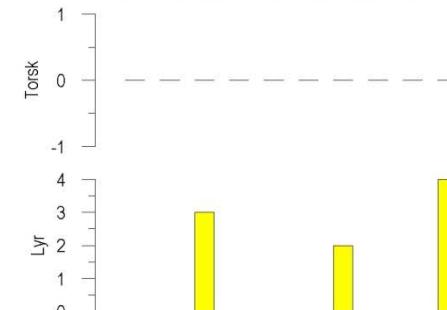
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 Jul 2016: 183 - 213 Aug 2016: 214 - 244 Sep 2016: 245 - 274 Okt 2016: 275 - 305 Nov 2016: 306 - 335 Dez 2016: 336 - 366



blå: antall beholdt RUSER
 grønn: antall utsatt RUSER

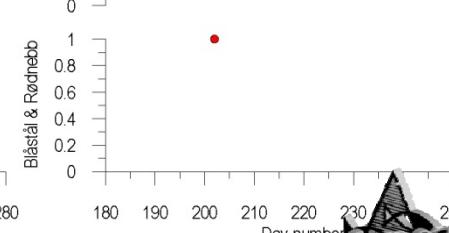
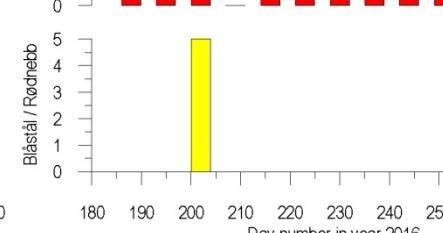
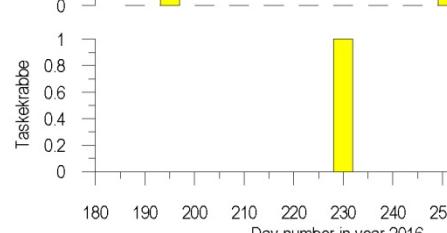
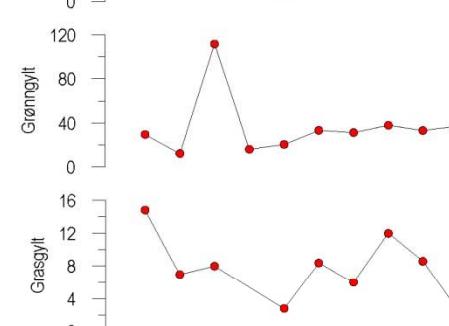
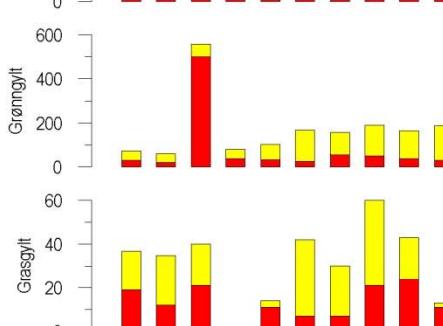
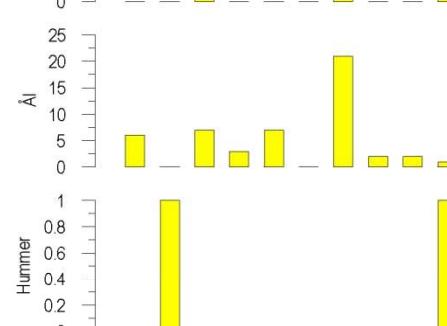
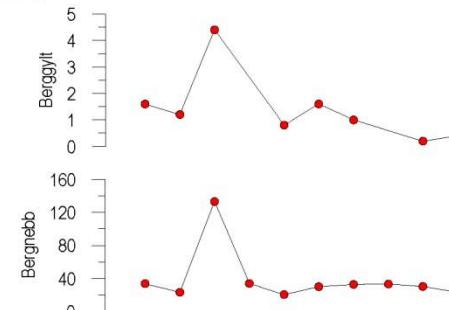
[NB: "Teiner" and "Ruser" bar charts are individually stacked, but "Teiner" bars are in front of "Ruser" bars and are thus not stacked on top of "Ruser" columns. "Teiner" bars are thinner than "Ruser" bars]

rød: antall beholdt TEINER
 gul: antall utsatt TEINER



CPUE

[N/gear og døgn]



Taskekrabbe

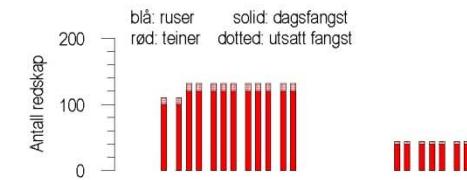
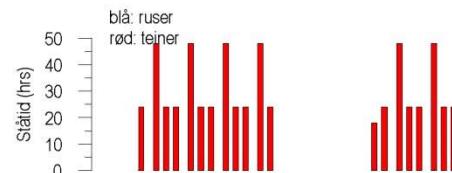
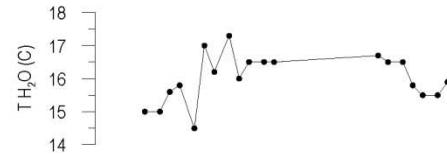
Blastål/Rønnebb

Blastål & Rønnebb

Lund2016

med flukåping

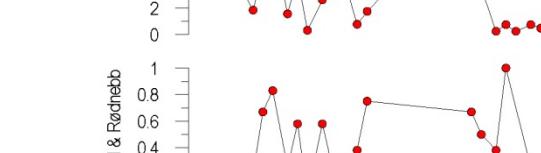
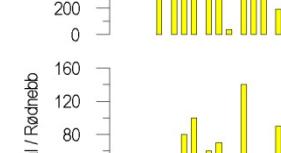
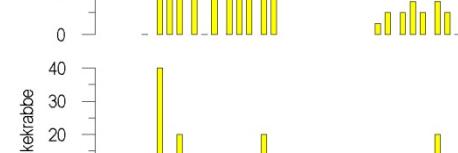
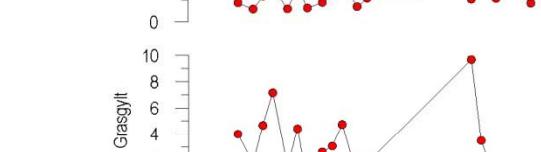
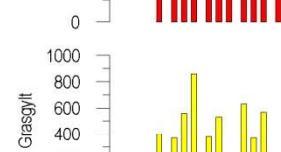
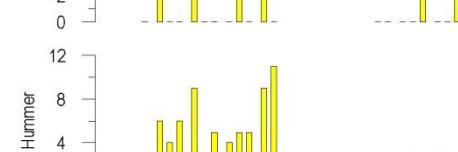
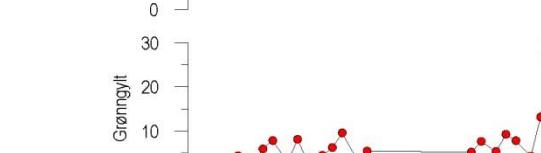
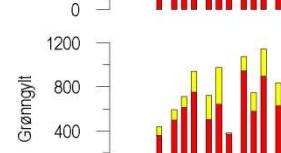
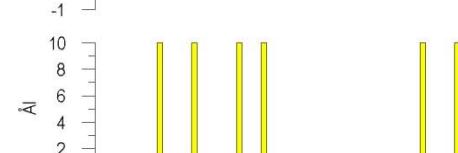
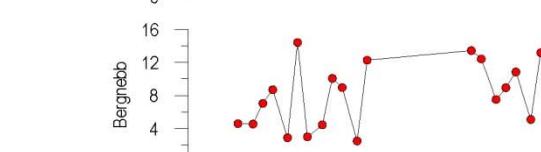
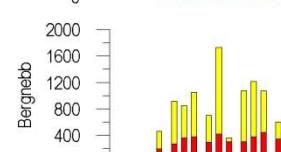
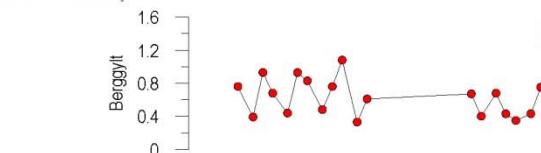
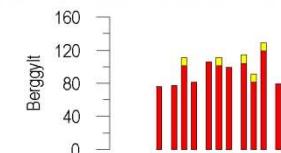
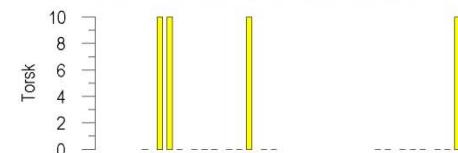
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blå: antall beholdt RUSER
 grønn: antall utsatt RUSER

rød: antall beholdt TEINER
 gul: antall utsatt TEINER

[NB: "Teiner" and "Ruser" bar charts are individually stacked, but "Teiner" bars in front of "Ruser" bars and are thus not stacked on top of "Ruser" columns. "Teiner" bars are thinner than "Ruser" bars]



Day number in year 2016

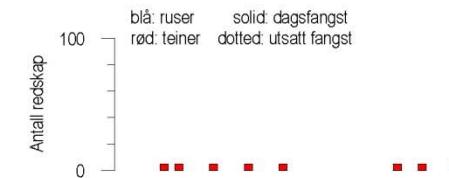
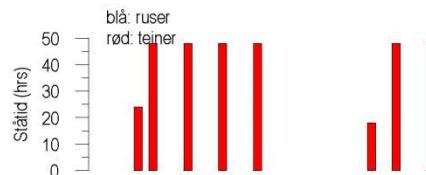
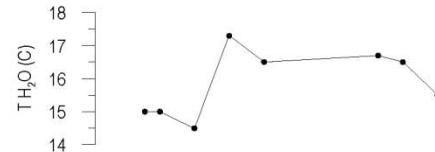
Day number in year 2016

Day number

Lund2016

uten flukåping

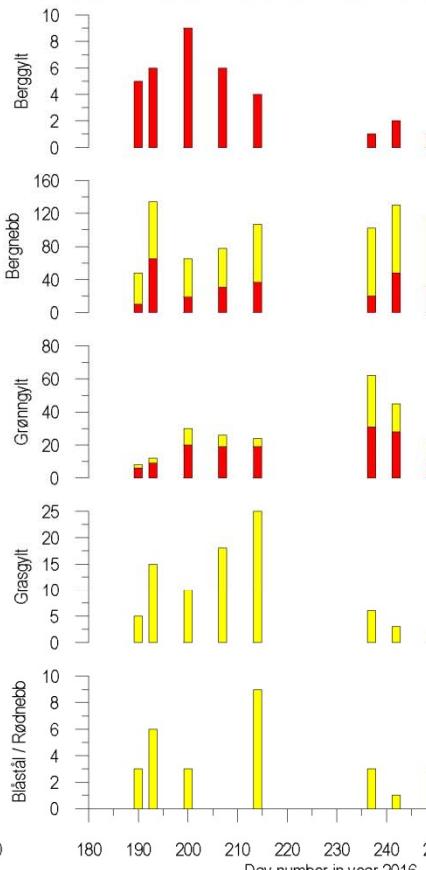
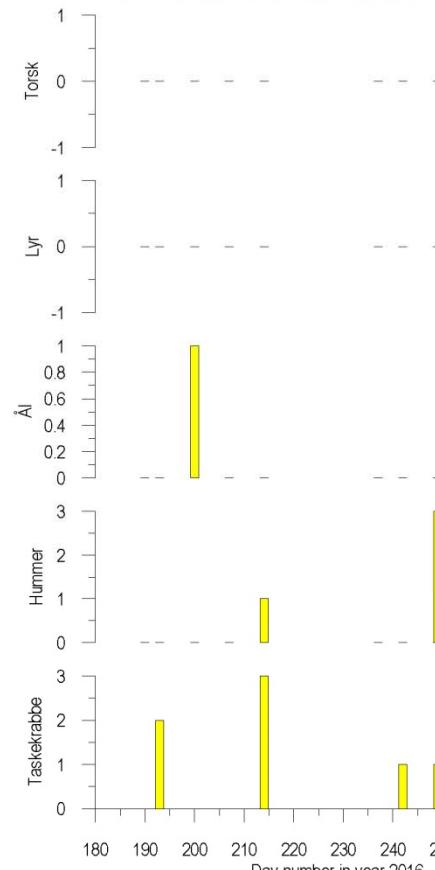
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blå: antall beholdt RUSER
 grønn: antall utsatt RUSER

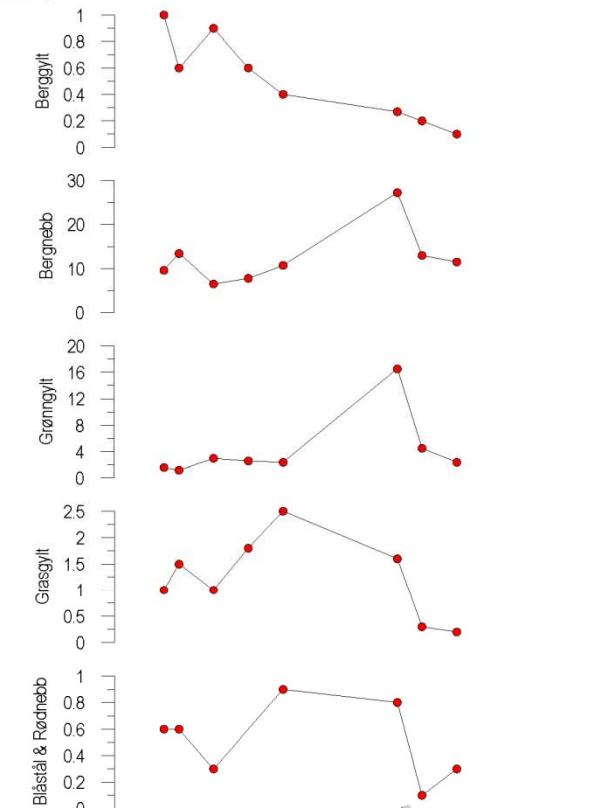
[NB: "Teiner" and "Ruser" bar charts are individually stacked, but "Teiner" bars are in front of "Ruser" bars and are thus not stacked on top of "Ruser" columns. "Teiner" bars are thinner than "Ruser" bars]

rød: antall beholdt TEINER
 gul: antall utsatt TEINER



CPUE

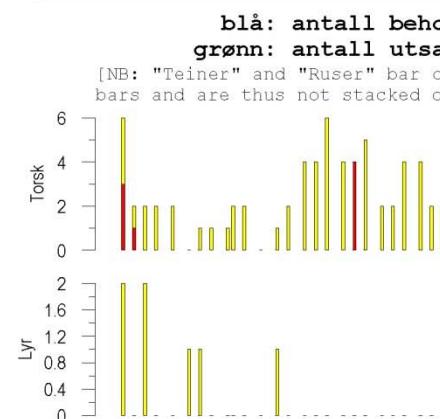
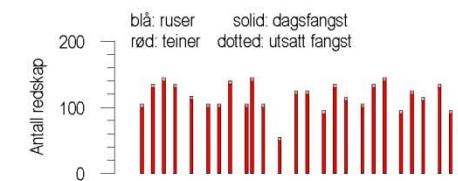
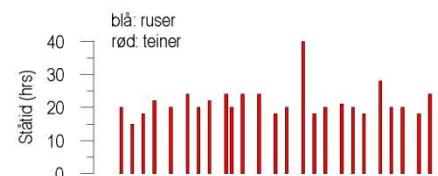
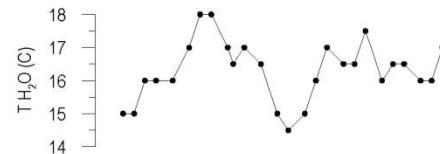
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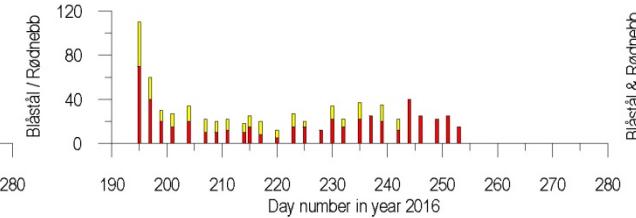
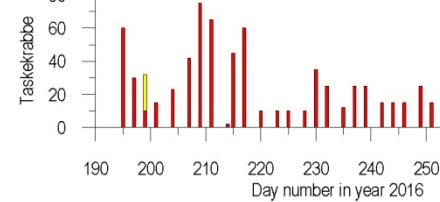
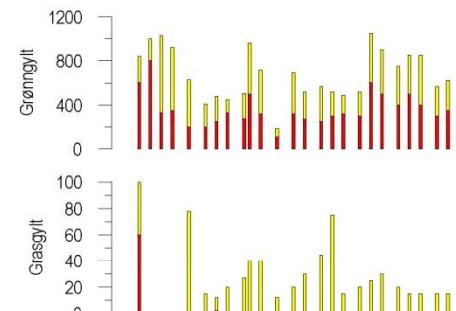
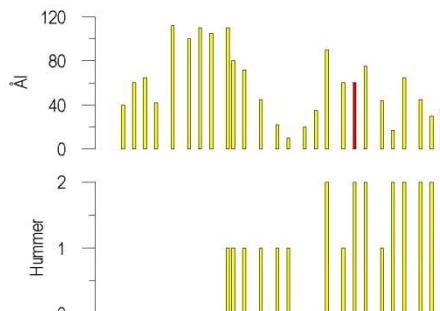
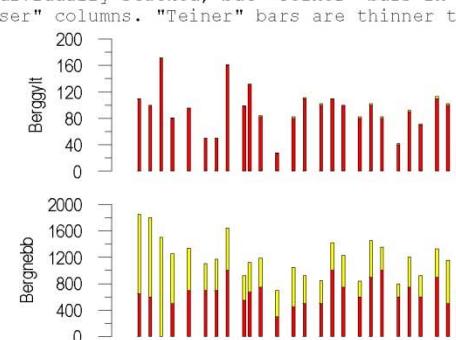
T.G.Olsen²⁰¹⁶

med flukåpning

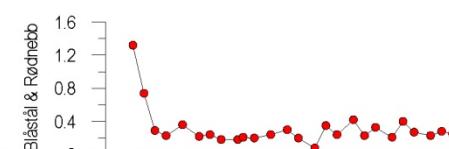
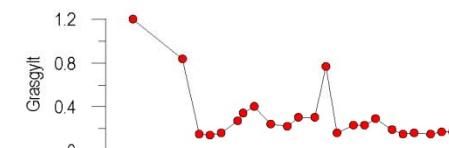
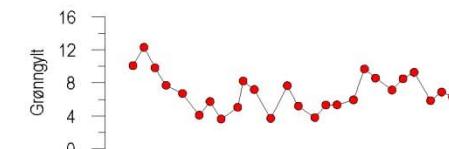
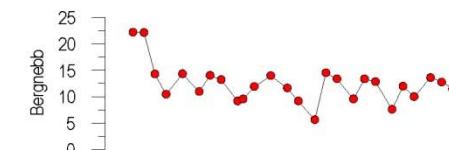
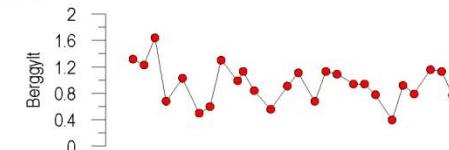
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rød: antall beholdt TEINER
 gul: antall utsatt TEINER

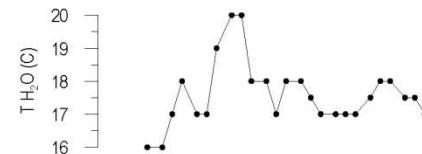


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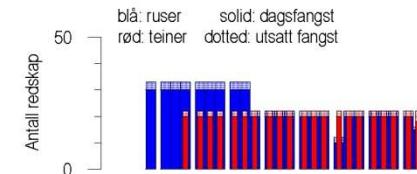
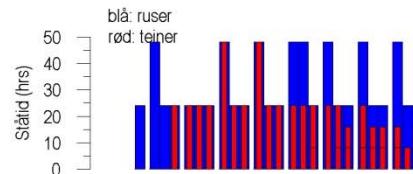


J.I.Olsen²⁰¹⁶

med flukåpning



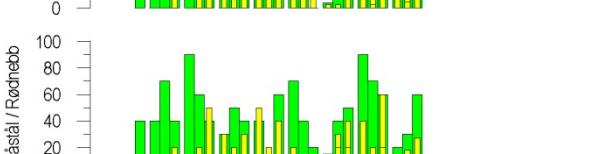
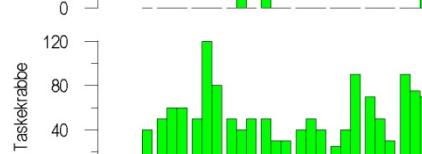
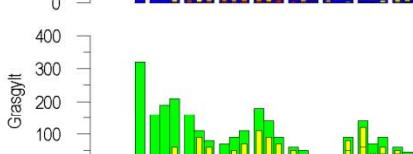
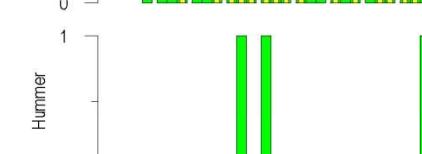
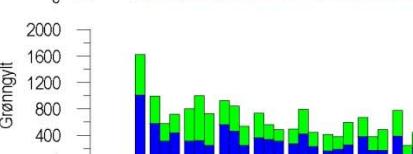
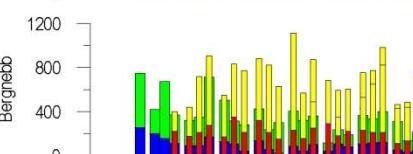
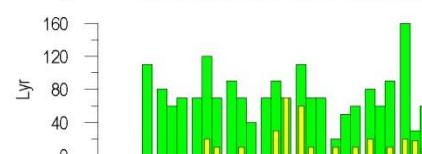
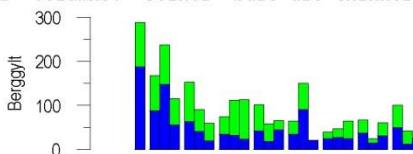
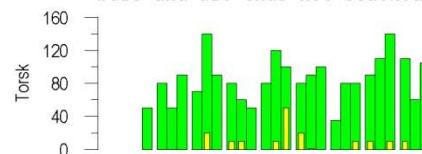
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blå: antall beholdt RUSER
grønn: antall utsatt RUSER

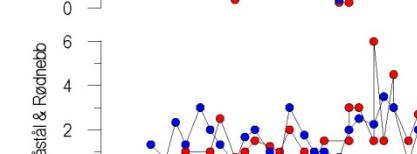
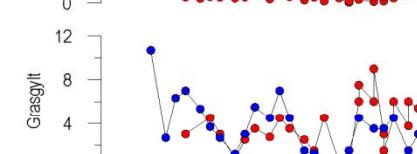
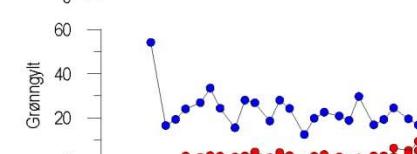
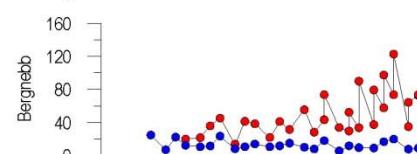
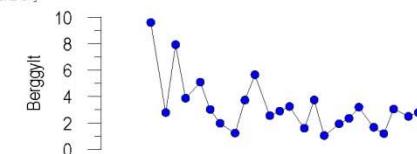
[NB: "Teiner" and "Ruser" bar charts are individually stacked, but "Teiner" bars are in front of "Ruser" bars and are thus not stacked on top of "Ruser" columns. "Teiner" bars are thinner than "Ruser" bars]

rød: antall beholdt TEINER
gul: antall utsatt TEINER



CPUE

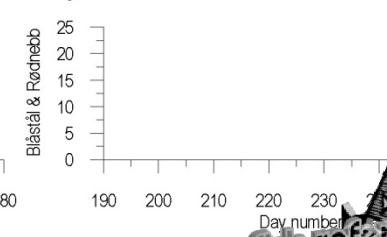
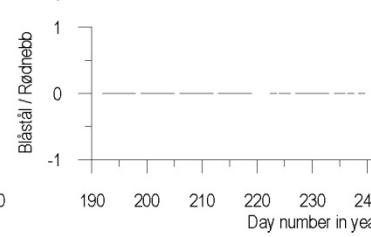
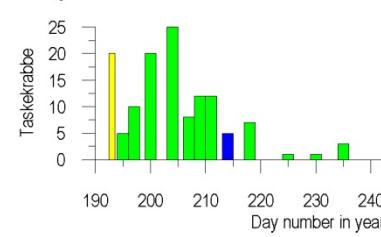
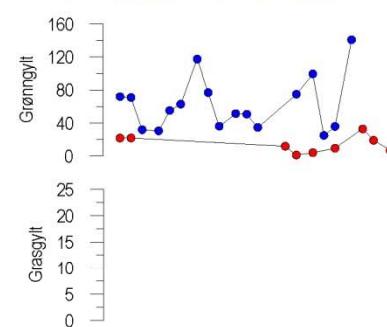
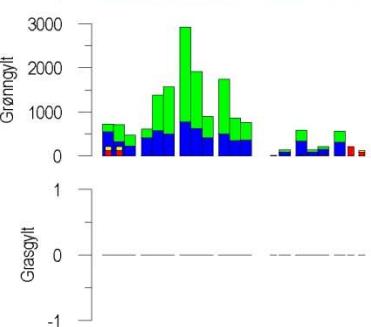
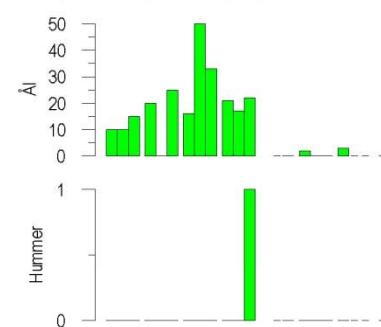
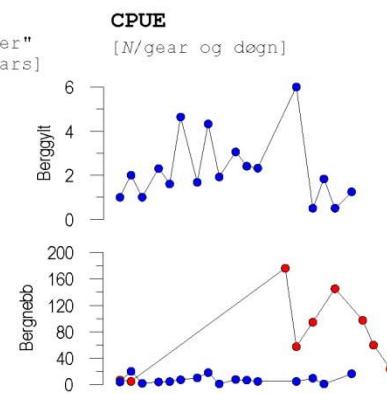
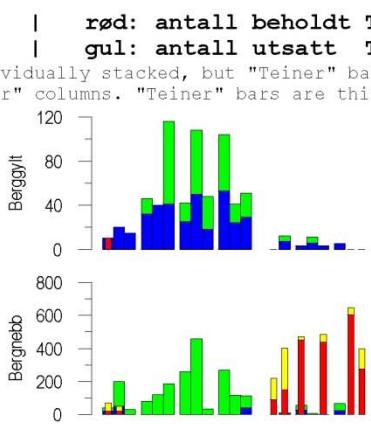
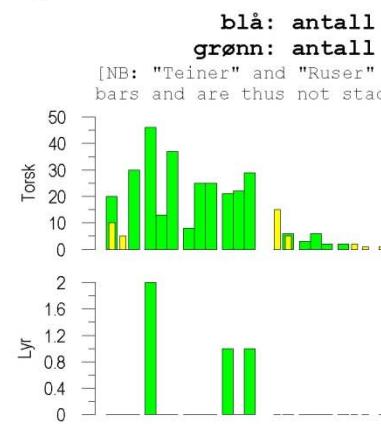
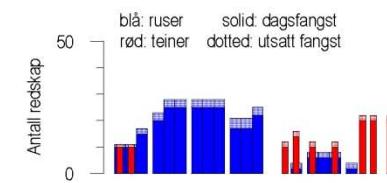
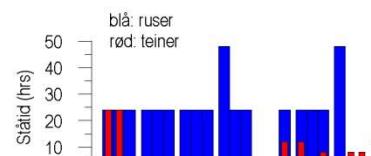
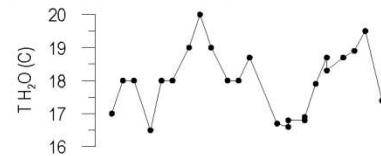
[N/gear og døgn]



Mikkelsen²⁰¹⁶

med flukåpning

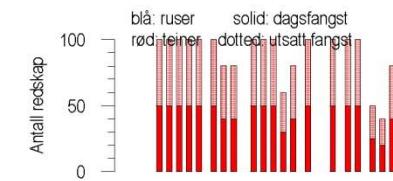
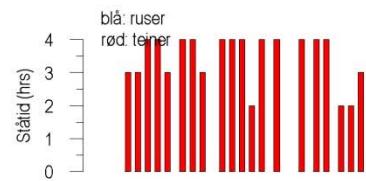
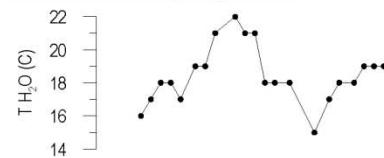
Jan 2016: 1 - 31 Feb 2016: 32 - 60 Mar 2016: 61 - 91 Apr 2016: 92 - 121 Mai 2016: 122 - 152 Jun 2016: 153 - 182
 Jul 2016: 183 - 213 Aug 2016: 214 - 244 Sep 2016: 245 - 274 Okt 2016: 275 - 305 Nov 2016: 306 - 335 Dez 2016: 336 - 366



Haraldsen 2016

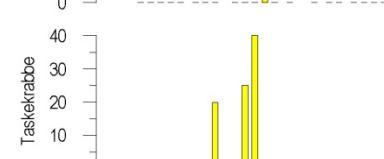
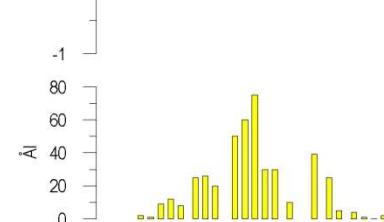
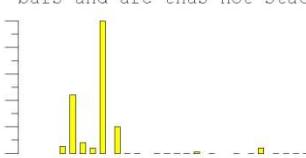
med flukåpning

Jan 2016: 1 - 31 Feb 2016: 32 - 60 Mar 2016: 61 - 91 Apr 2016: 92 - 121 Mai 2016: 122 - 152 Jun 2016: 153 - 182
 Jul 2016: 183 - 213 Aug 2016: 214 - 244 Sep 2016: 245 - 274 Okt 2016: 275 - 305 Nov 2016: 306 - 335 Dez 2016: 336 - 366

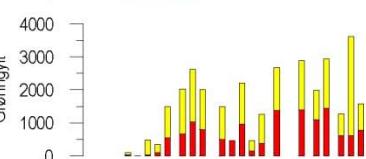
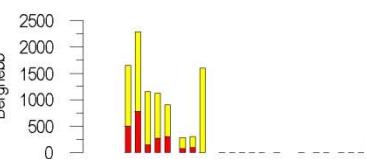
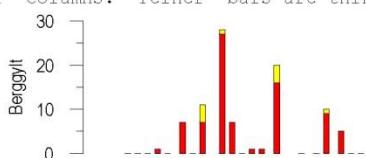


blå: antall beholdt RUSER
 grønn: antall utsatt RUSER

[NB: "Teiner" and "Ruser" bar charts are individually stacked, but "Teiner" bars are in front of "Ruser" bars and are thus not stacked on top of "Ruser" columns. "Teiner" bars are thinner than "Ruser" bars]

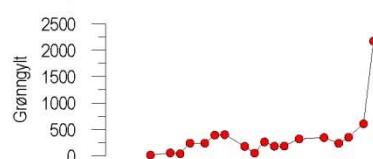
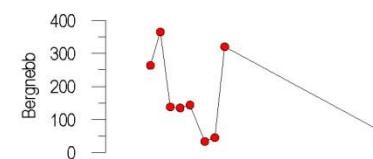
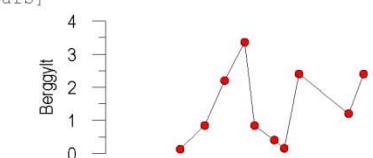


rød: antall beholdt TEINER
 gul: antall utsatt TEINER



CPUE

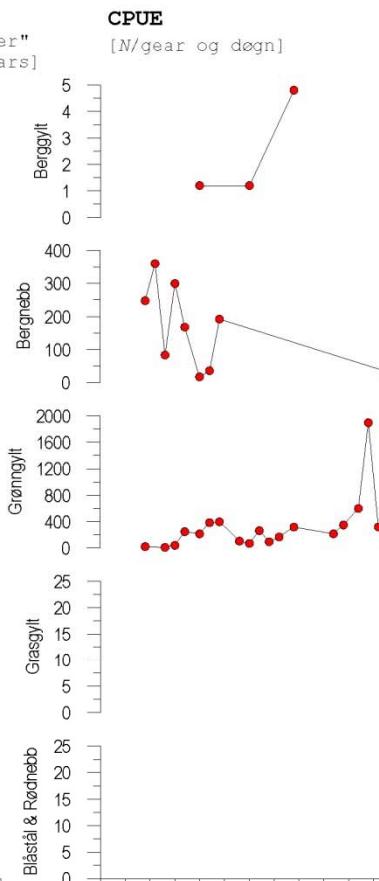
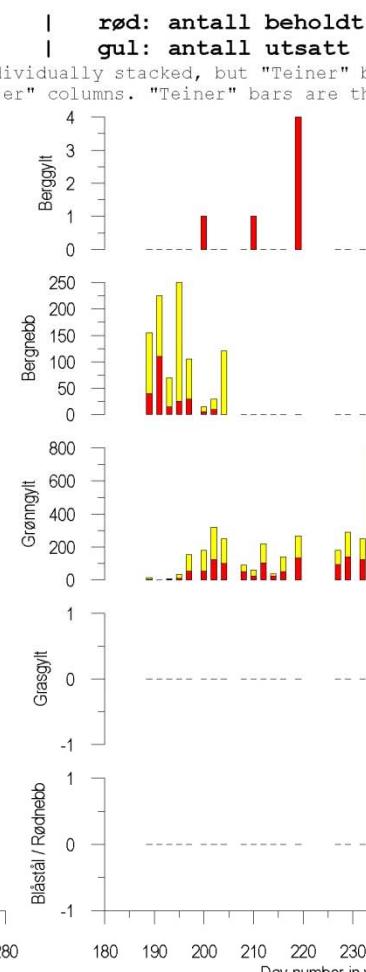
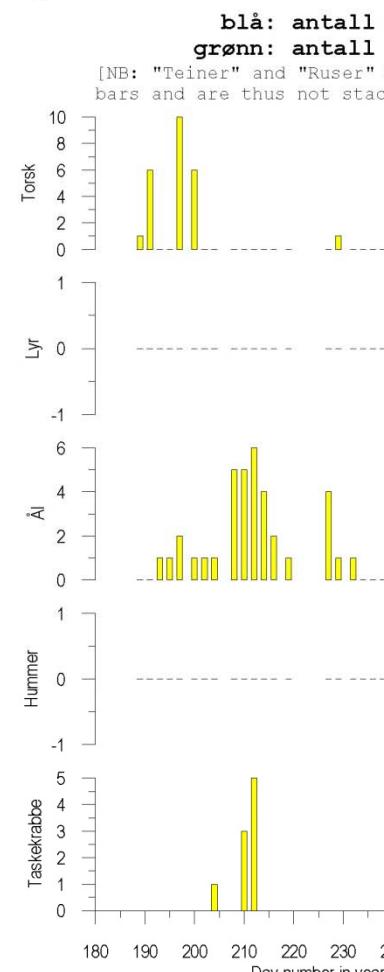
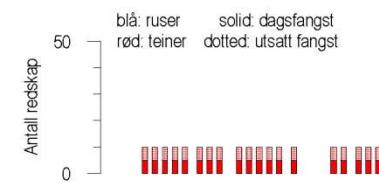
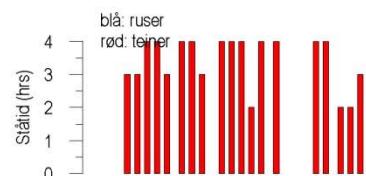
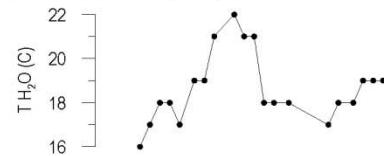
[N/gear og døgn]



Haraldsen2016

uten flukåpning

Jan 2016: 1 - 31 Feb 2016: 32 - 60 Mar 2016: 61 - 91 Apr 2016: 92 - 121 Mai 2016: 122 - 152 Jun 2016: 153 - 182
 Jul 2016: 183 - 213 Aug 2016: 214 - 244 Sep 2016: 245 - 274 Okt 2016: 275 - 305 Nov 2016: 306 - 335 Dez 2016: 336 - 366



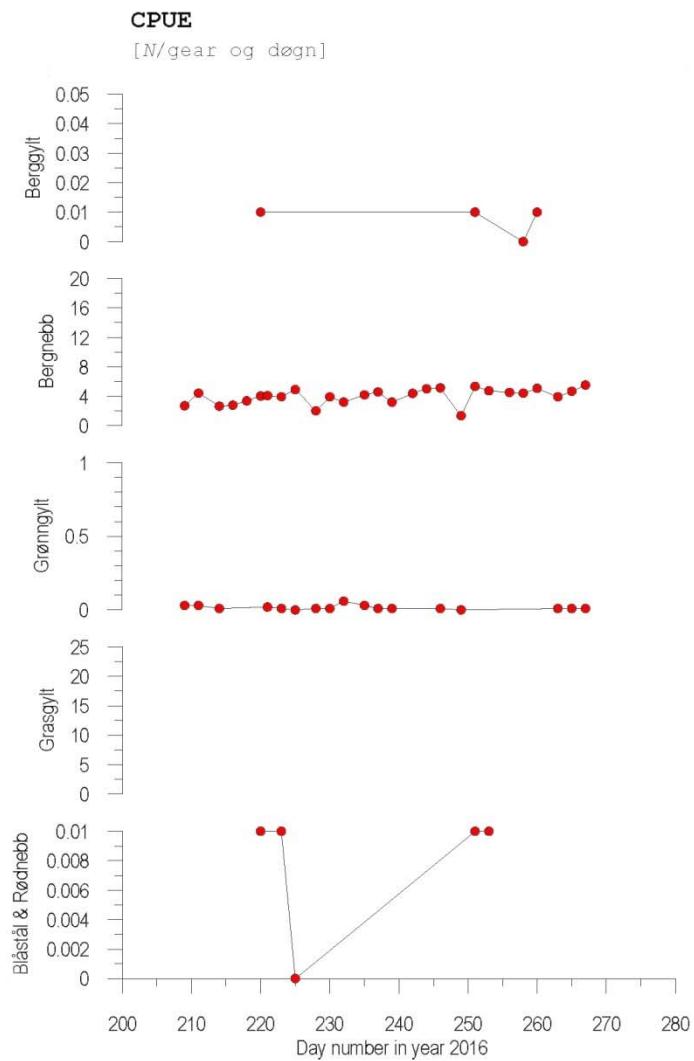
CPUE 2016

med fluktåpning / uten fluktåpning
Mårvik / Dyngvold / Tøkje / Lund / Haraldsen
(dvs nord – sør)

- NB 1: forskjellige skaleringer for y-akser mellom fiskerne.
- NB 2: identiske skaleringer for y-akser per fisker og art
- NB 3: CPUE = CPUE _{beholdt + utsatt}

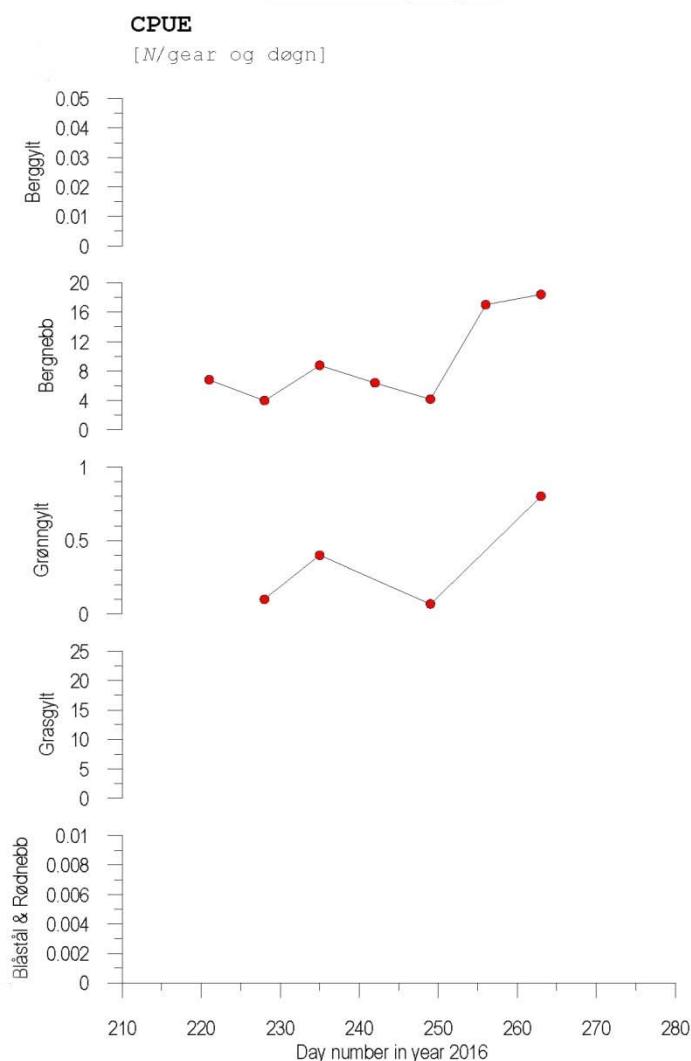
Mårvik 2016

med flukåpning

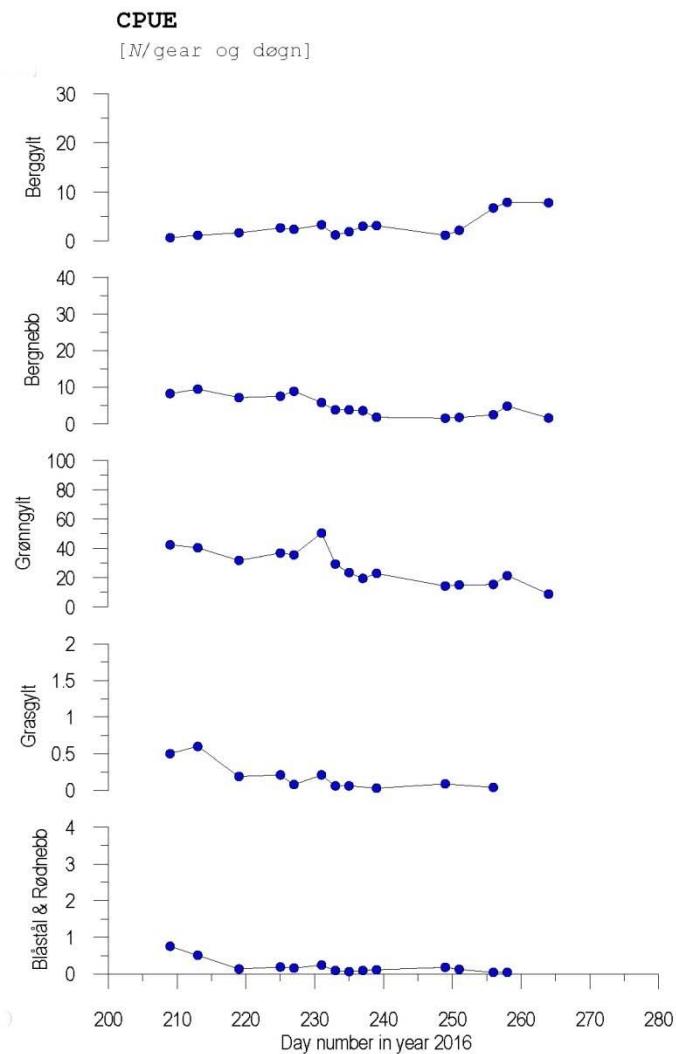


Mårvik 2016

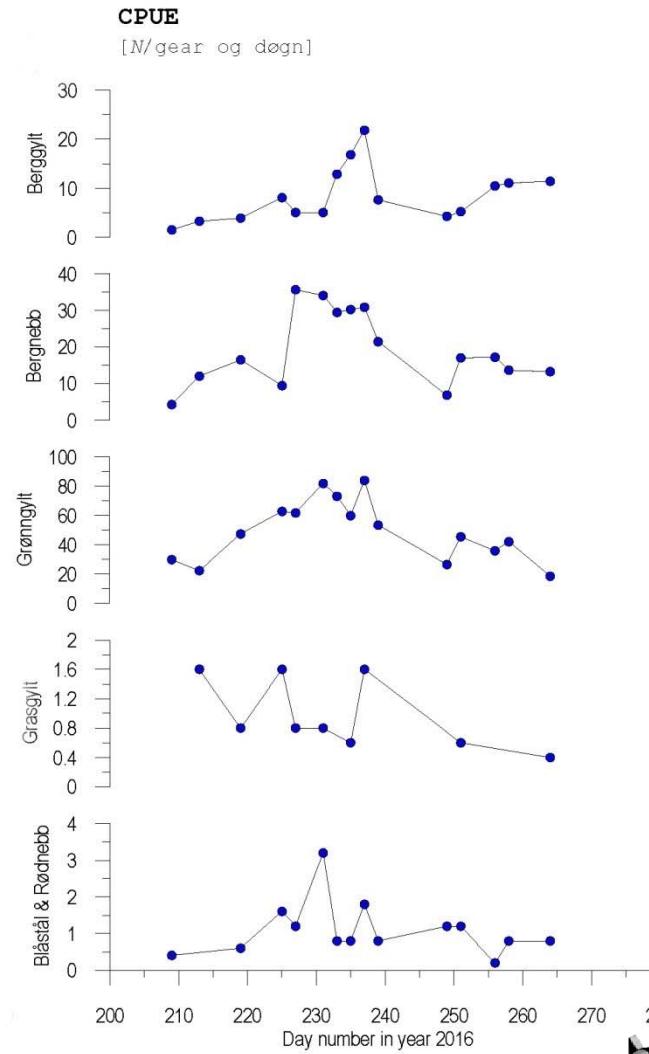
uten flukåpning



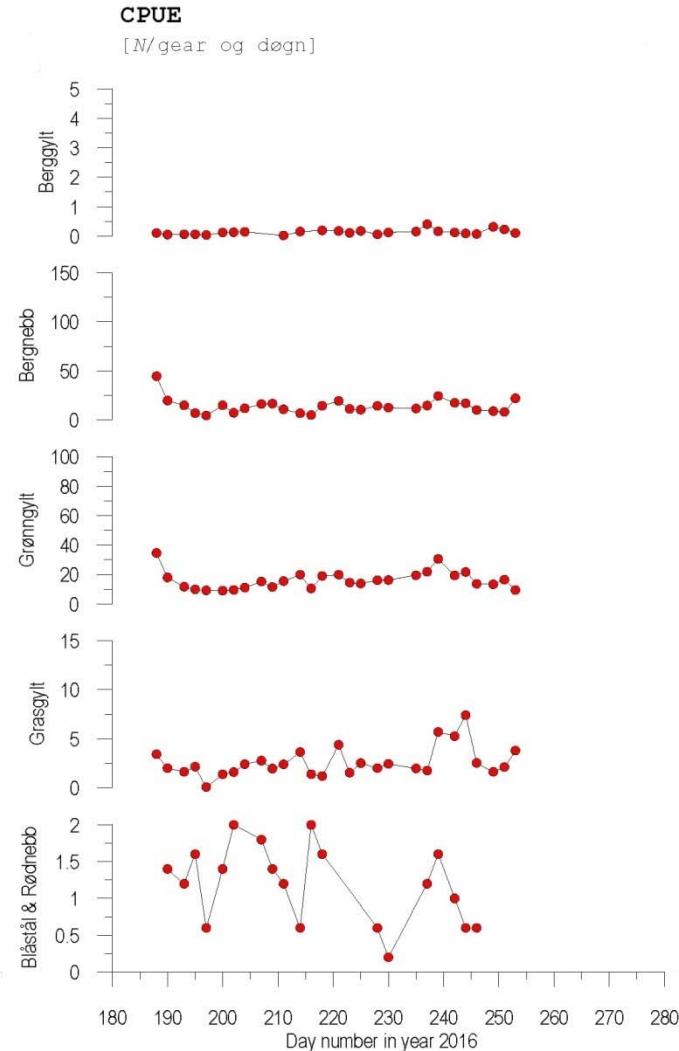
Dyngvold²⁰¹⁶ med flukåpning



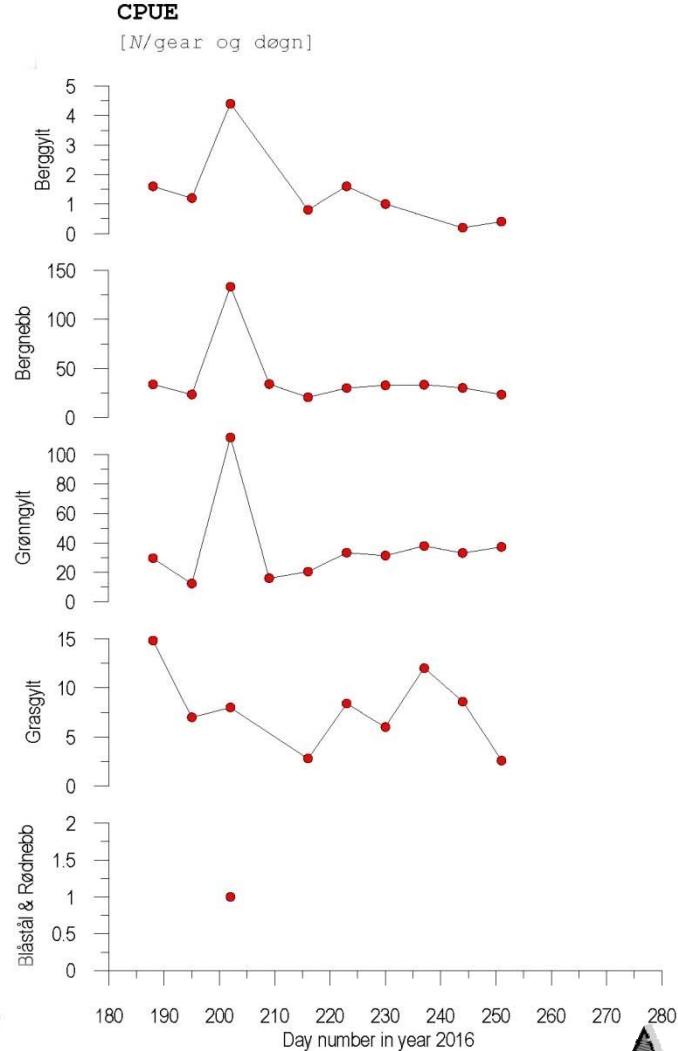
Dyngvold²⁰¹⁶ uten flukåpning



Tøkje²⁰¹⁶ med flukåpning



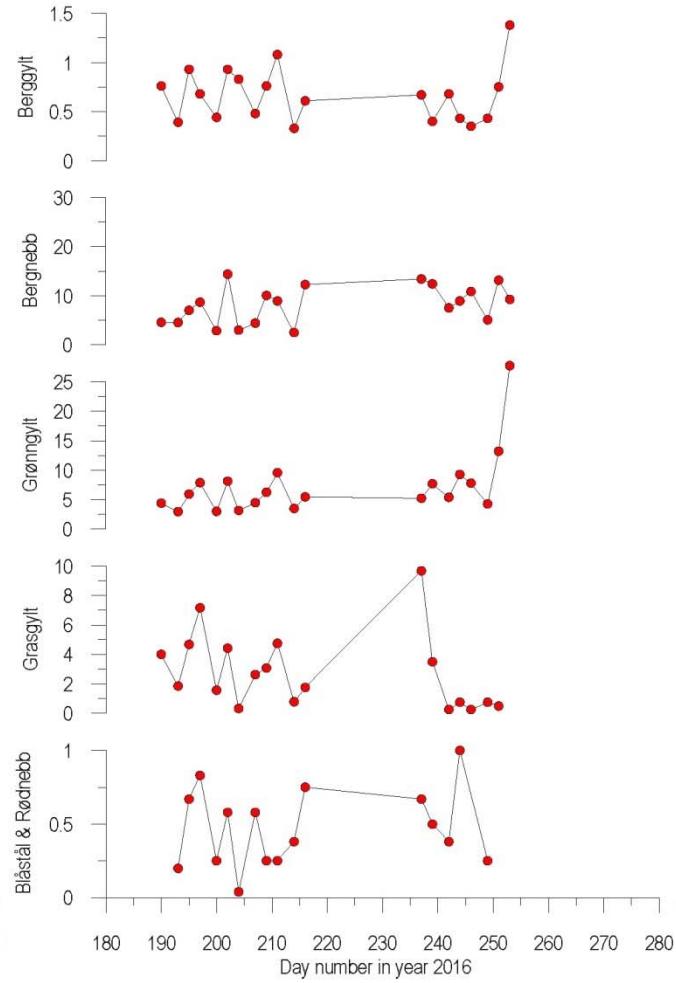
Tøkje²⁰¹⁶ uten flukåpning



Lund²⁰¹⁶ med flukåpning

CPUE

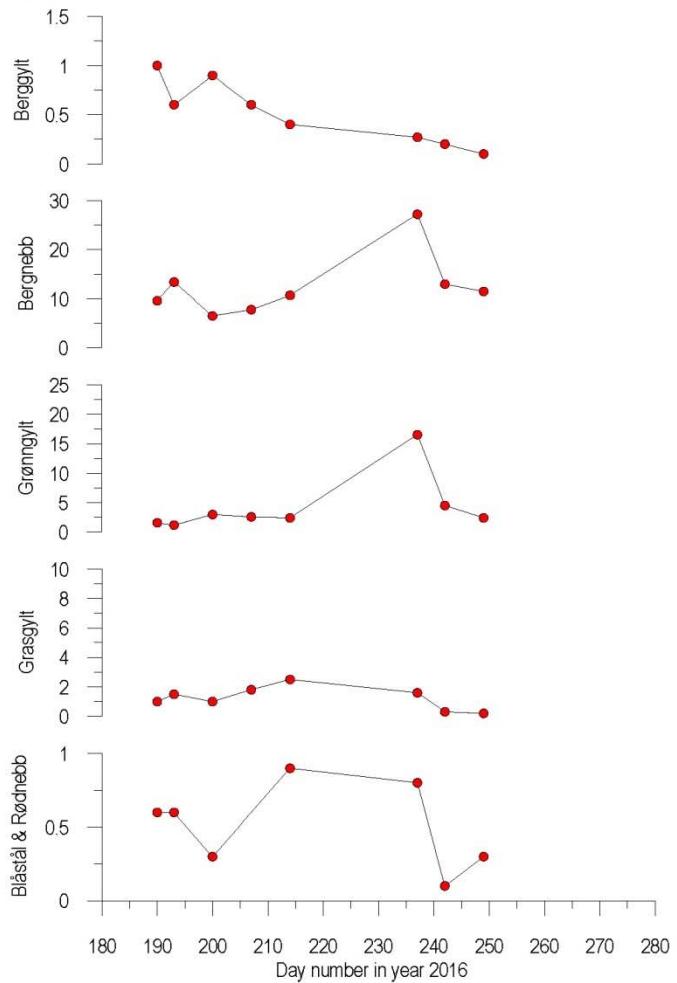
[N/gear og døgn]



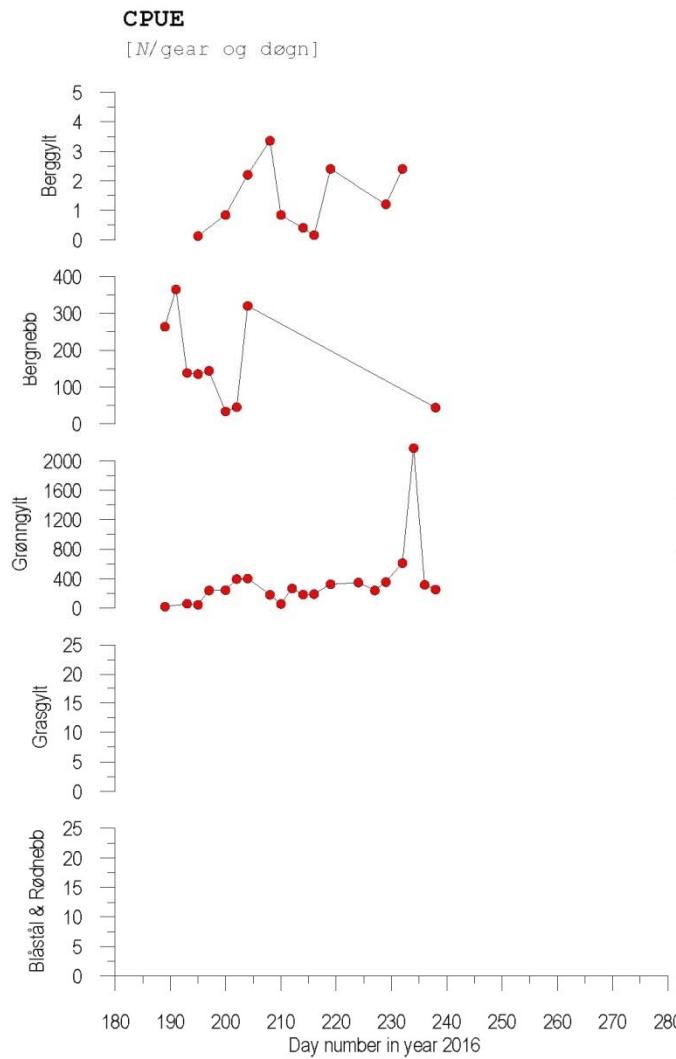
Lund²⁰¹⁶ uten flukåpning

CPUE

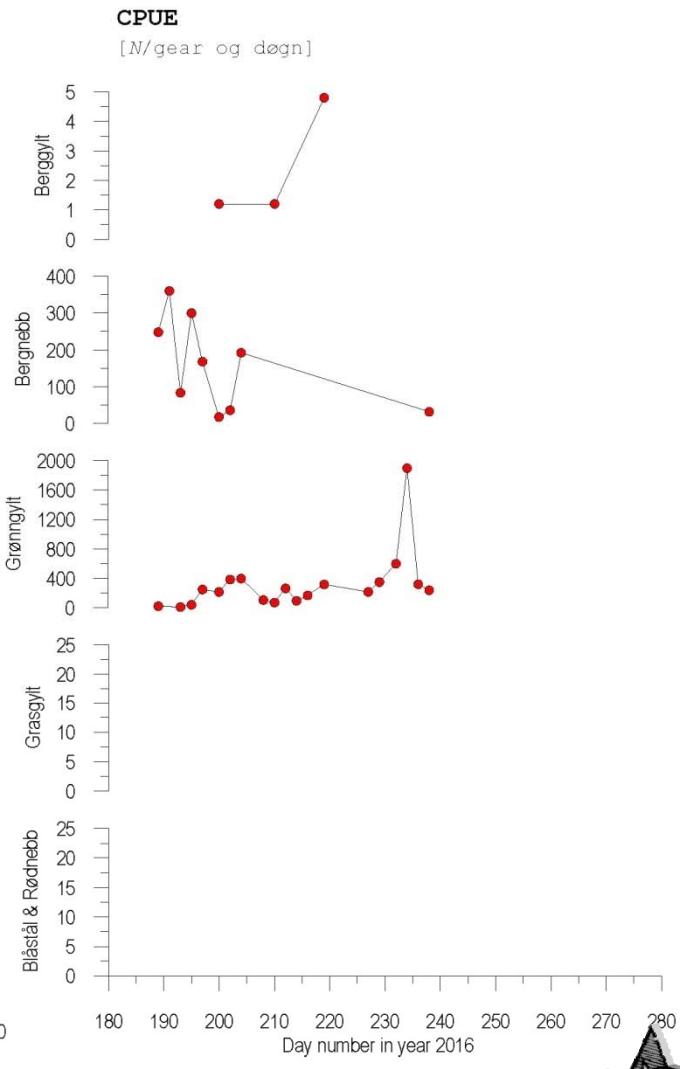
[N/gear og døgn]



Haraldsen²⁰¹⁶ med flukåpning



Haraldsen²⁰¹⁶ uten flukåpning



Konklusjon

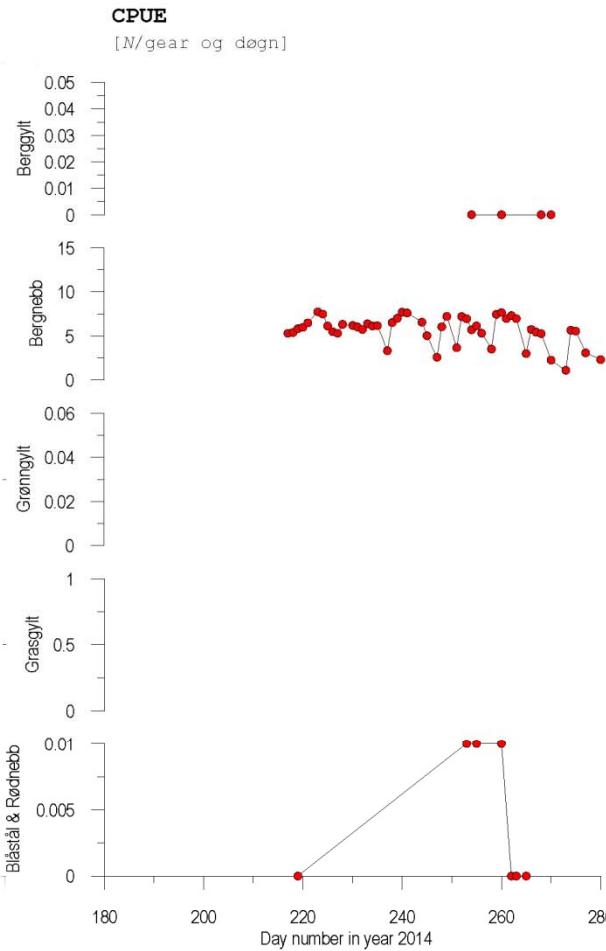
- Sammenhengen for de fleste er som forventet: CPUE_{uten fluktåning} > CPUE_{med fluktåpning} dvs. det er "lettere" å få mye fisk i redskaper uten fluktåpning.
 - Ingen overraskelse ☺!
 - Forskjellene er likevel ikke veldig store.

CPUE for 2014 / 2015 / 2016

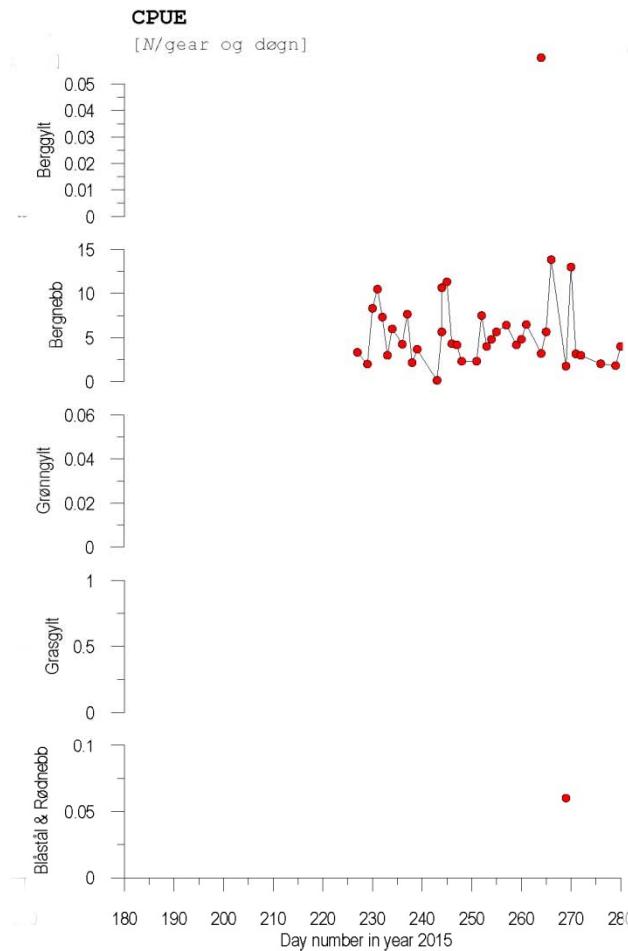
Mårvik / Holm / Dyngvold / Tøkje / Lund / J.I.Olsen / Haraldsen
(dvs nord – sør)

- NB 1: forskjellige skaleringer for y-akser mellom fiskerne.
- NB 2: identiske skaleringer for y-akser for alle tre årene per fisker og art
- NB 3: CPUE = CPUE _{beholdt + utsatt}

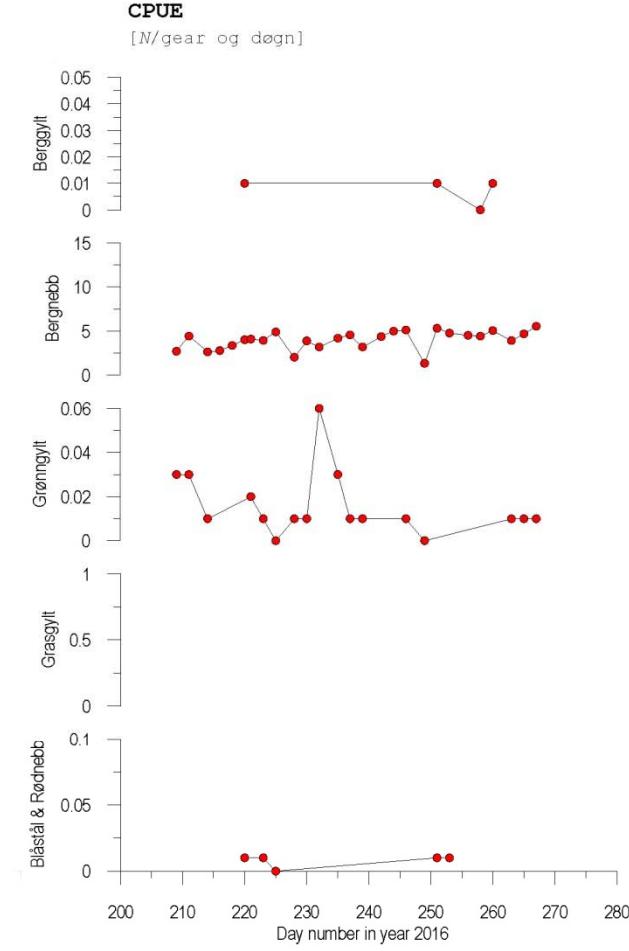
Mårvik²⁰¹⁴ uten flukåpning [Y/N]



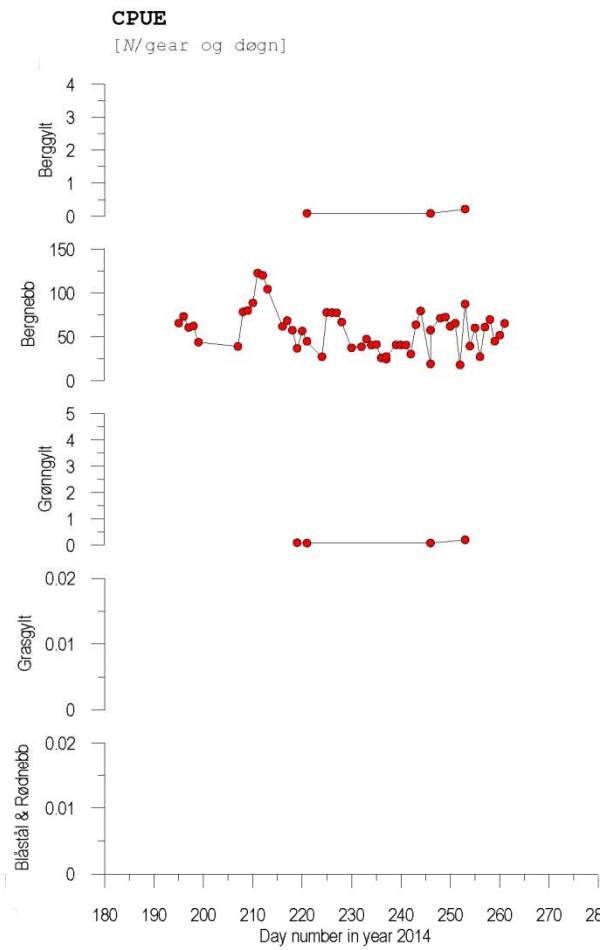
Mårvik²⁰¹⁵ med flukåpning



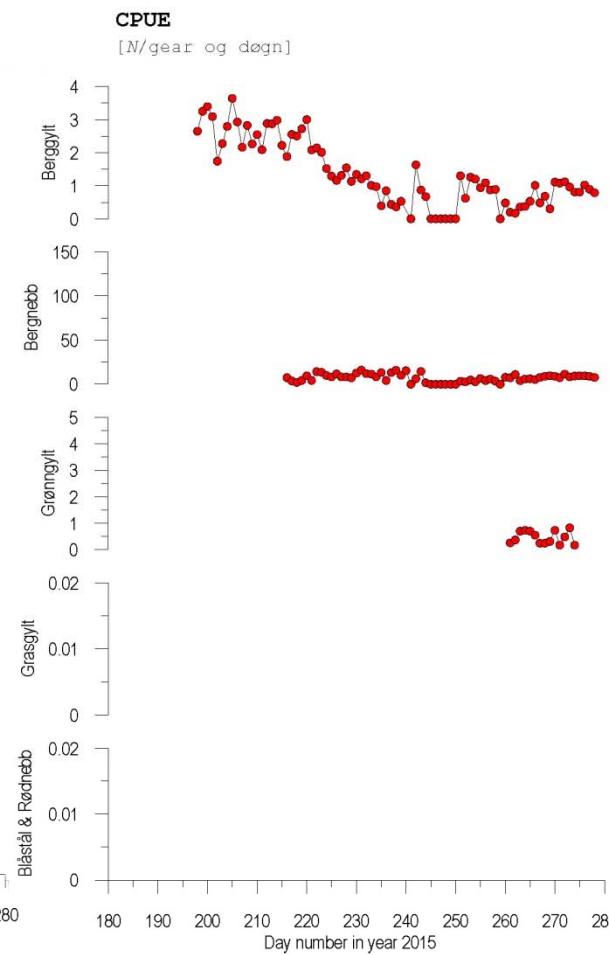
Mårvik²⁰¹⁶ med flukåpning



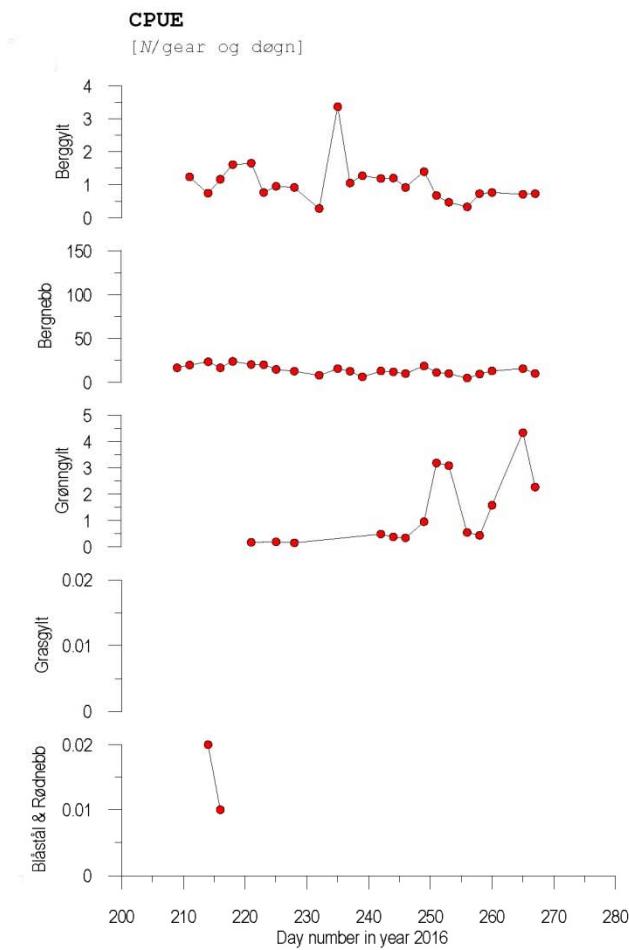
Holm²⁰¹⁴ med flukåpning [Y/N]



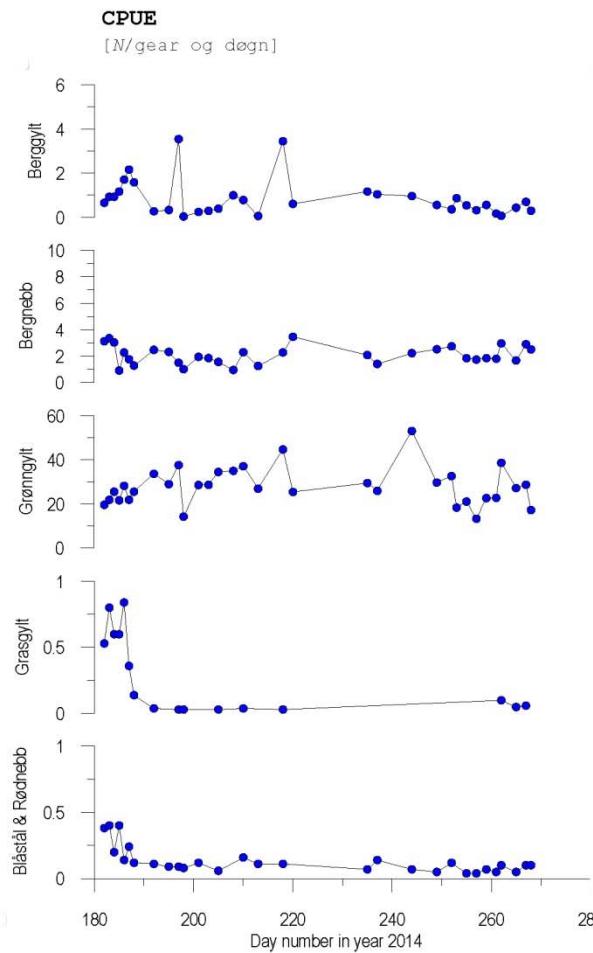
Holm²⁰¹⁵ med flukåpning



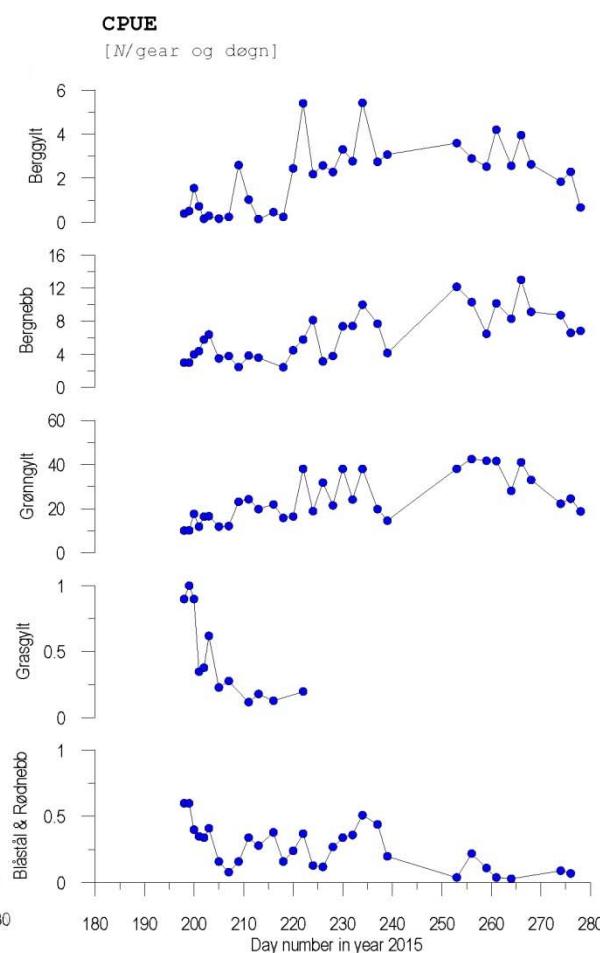
Holm²⁰¹⁶ med flukåpning



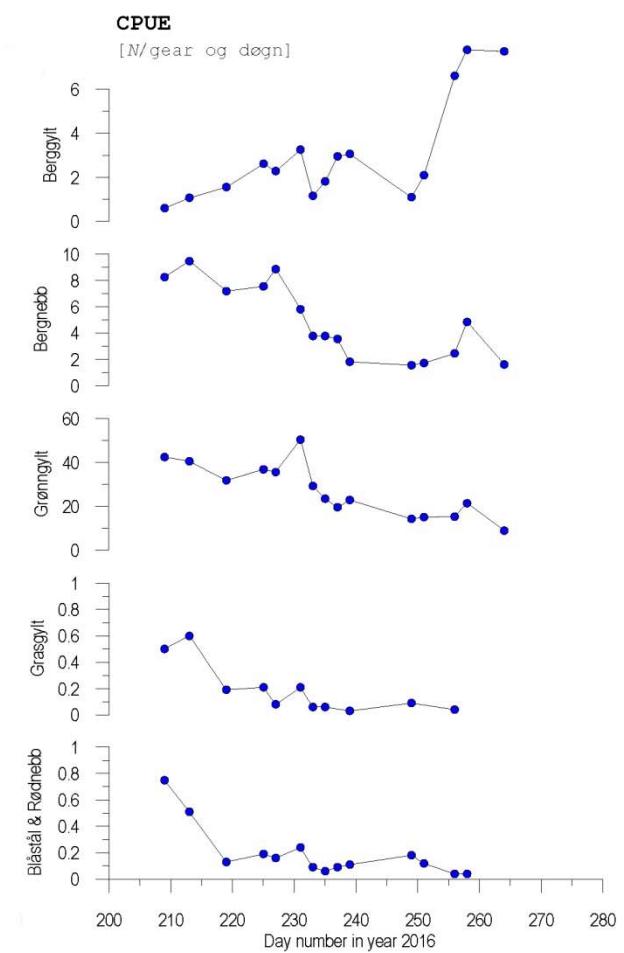
Dyngvold²⁰¹⁴ uten flukåpning [N/Y]



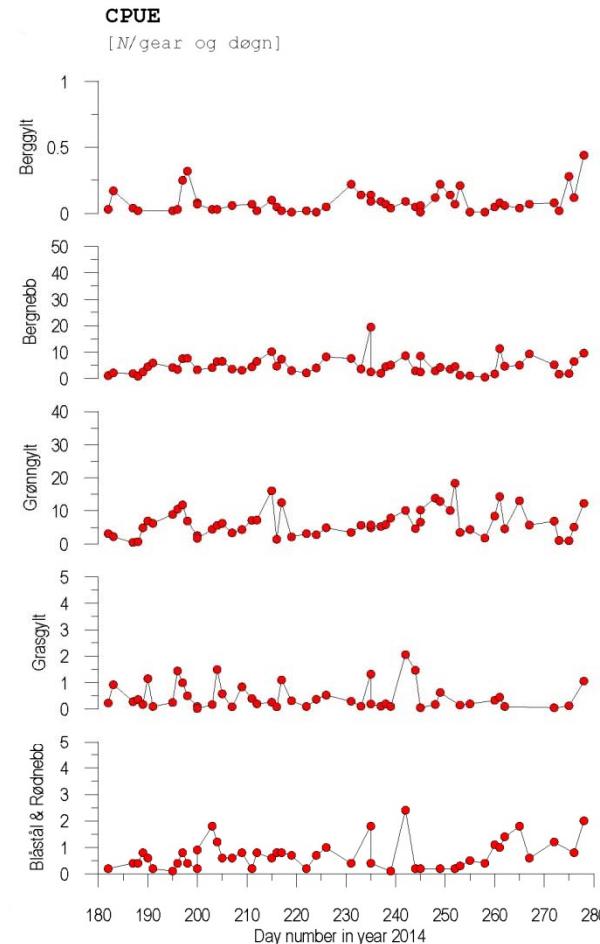
Dyngvold²⁰¹⁵ med fluktåpning



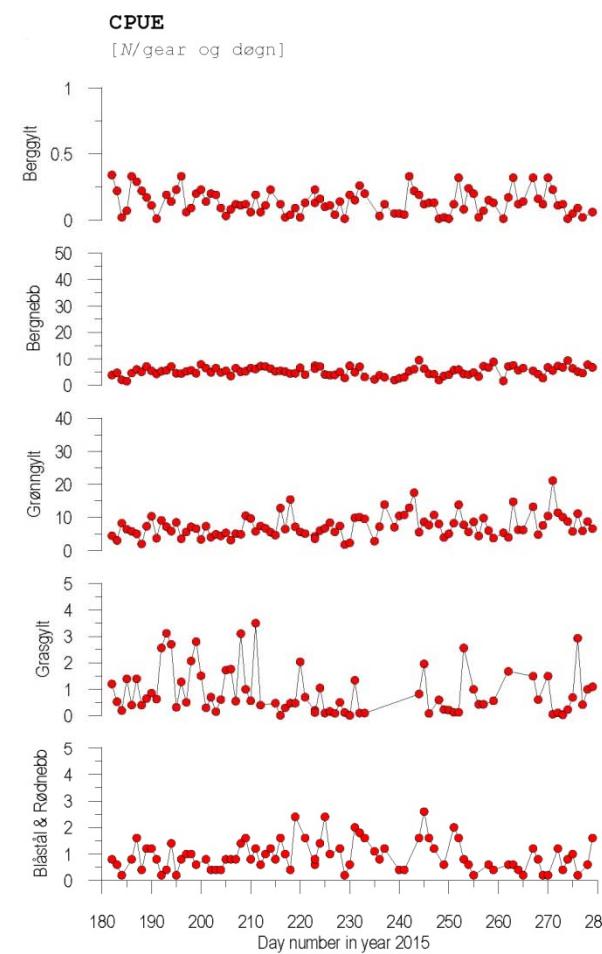
Dyngvold²⁰¹⁶ med flukåpning



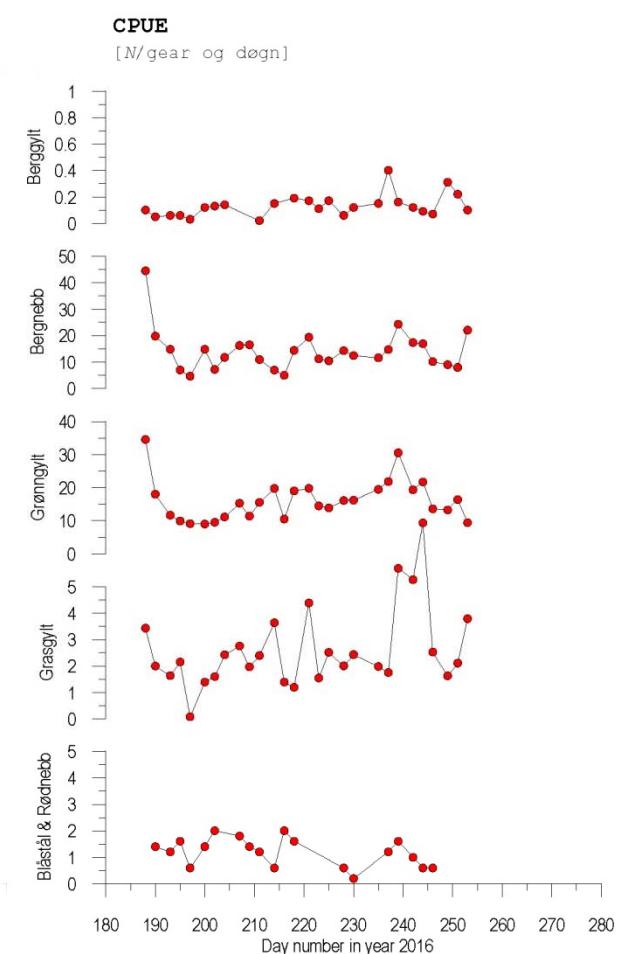
Tøkje²⁰¹⁴ med flukåpning [Y/N]

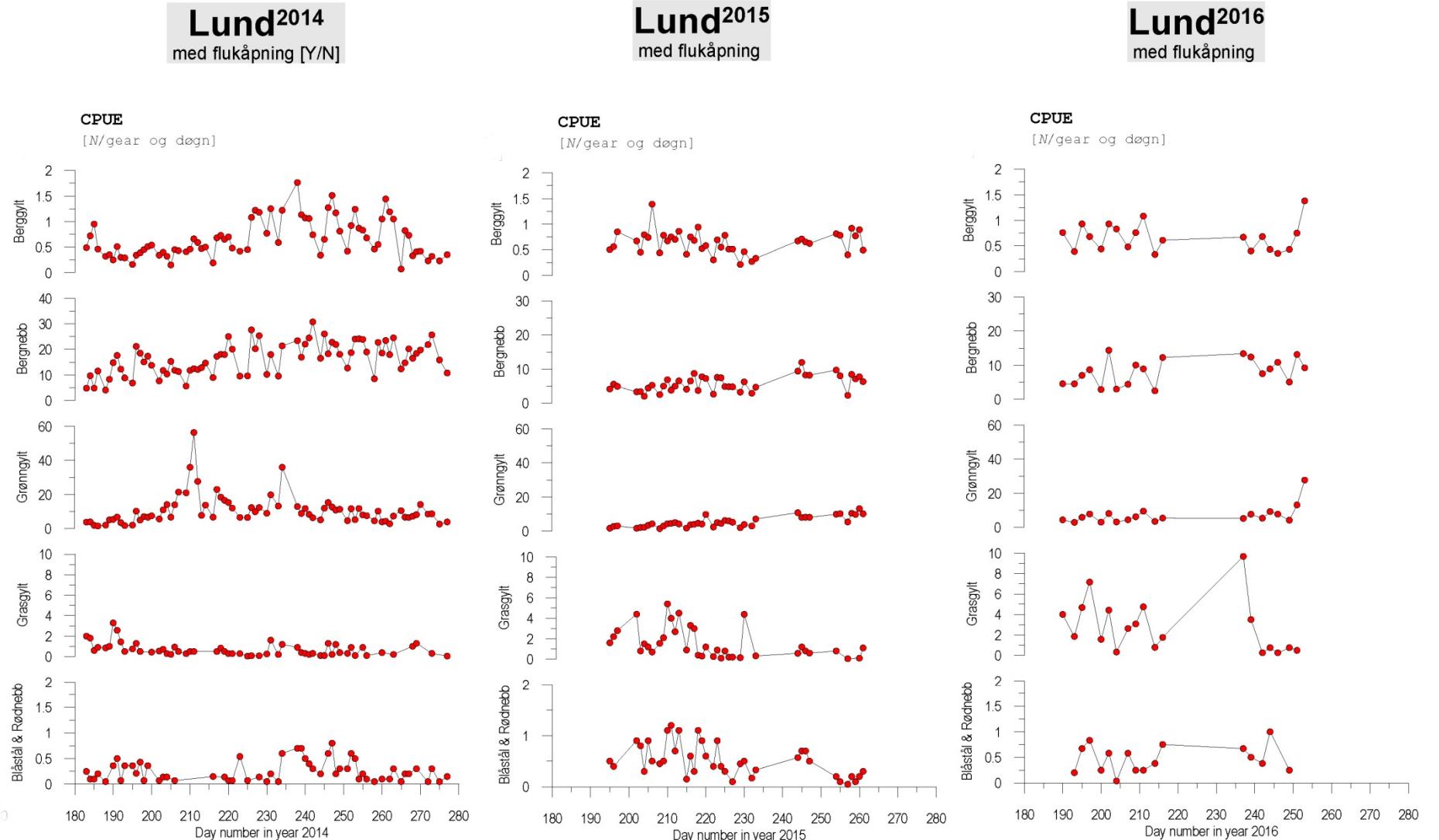


Tøkje²⁰¹⁵ med flukåpning

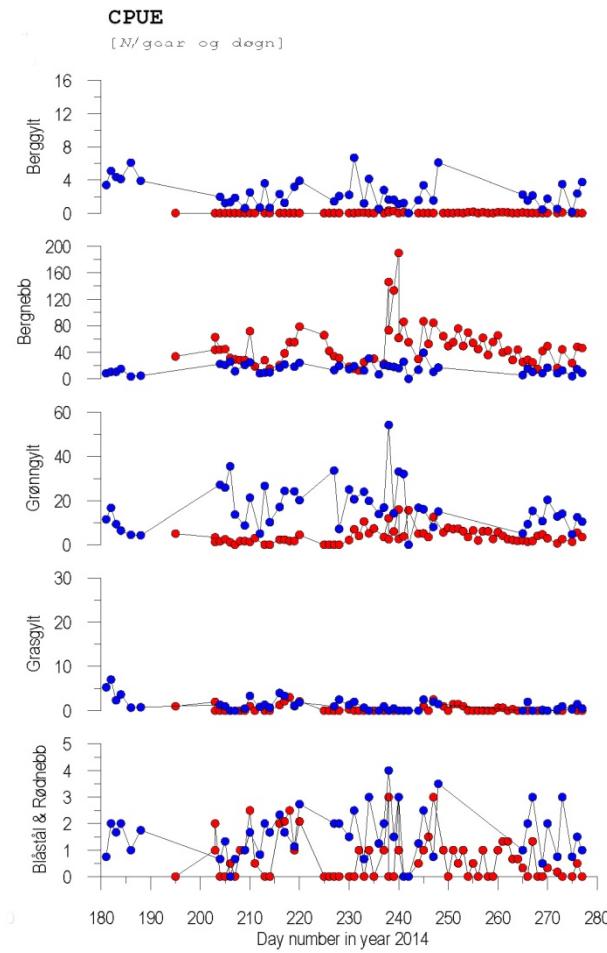


Tøkje²⁰¹⁶ med flukåpning

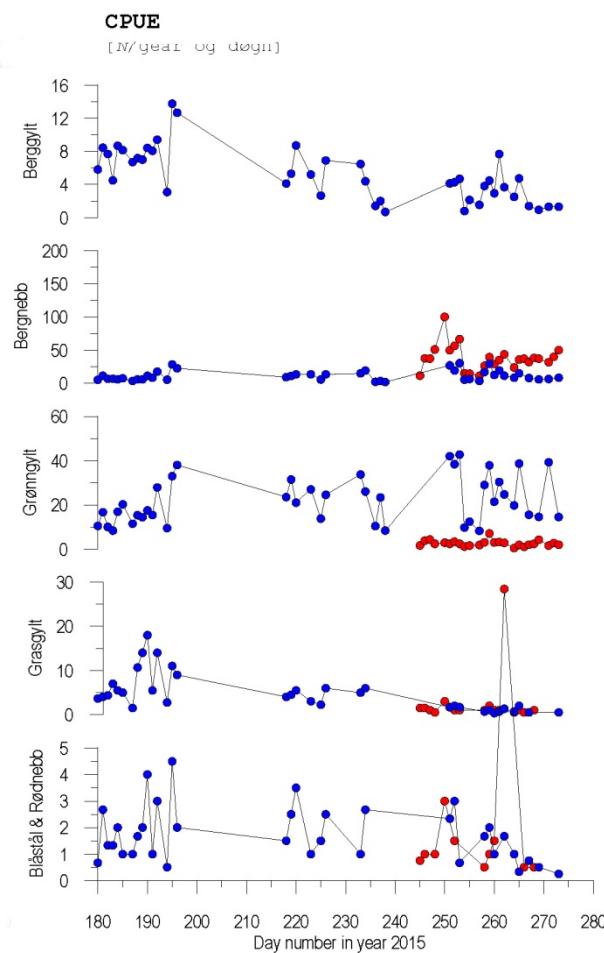




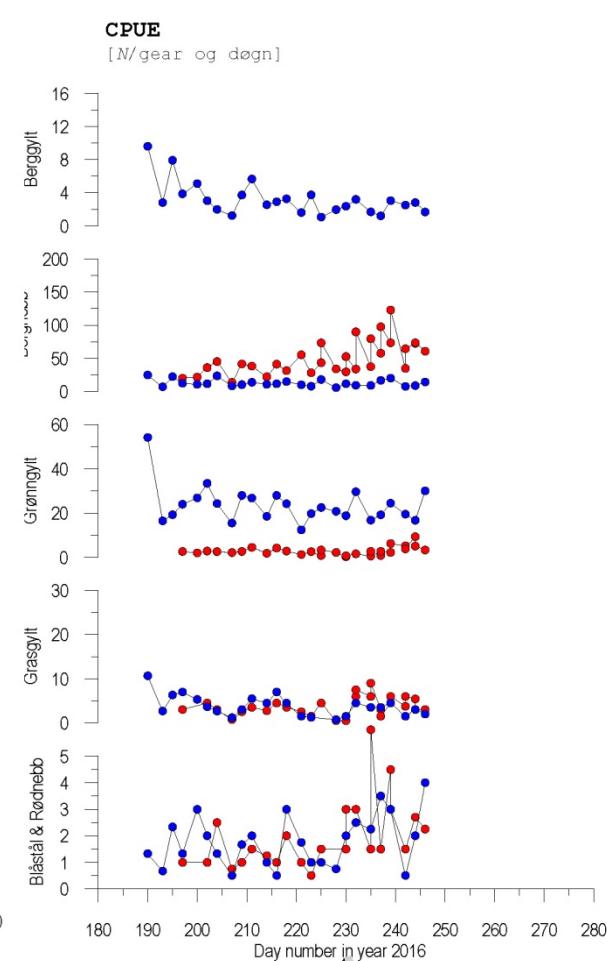
J.I.Olsen²⁰¹⁴
uten flukåpning [N/N]



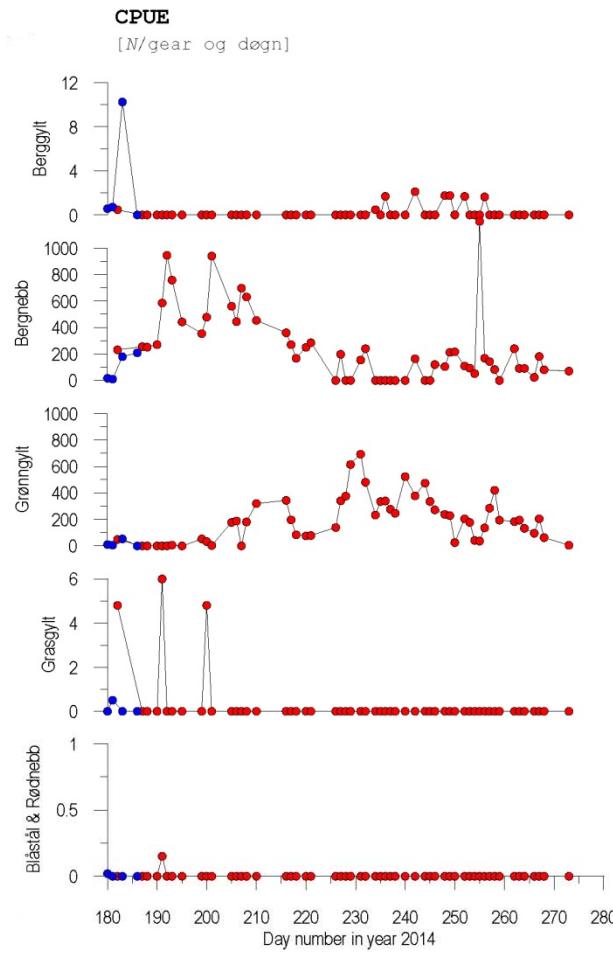
J.I.Olsen²⁰¹⁵
med flukåpning



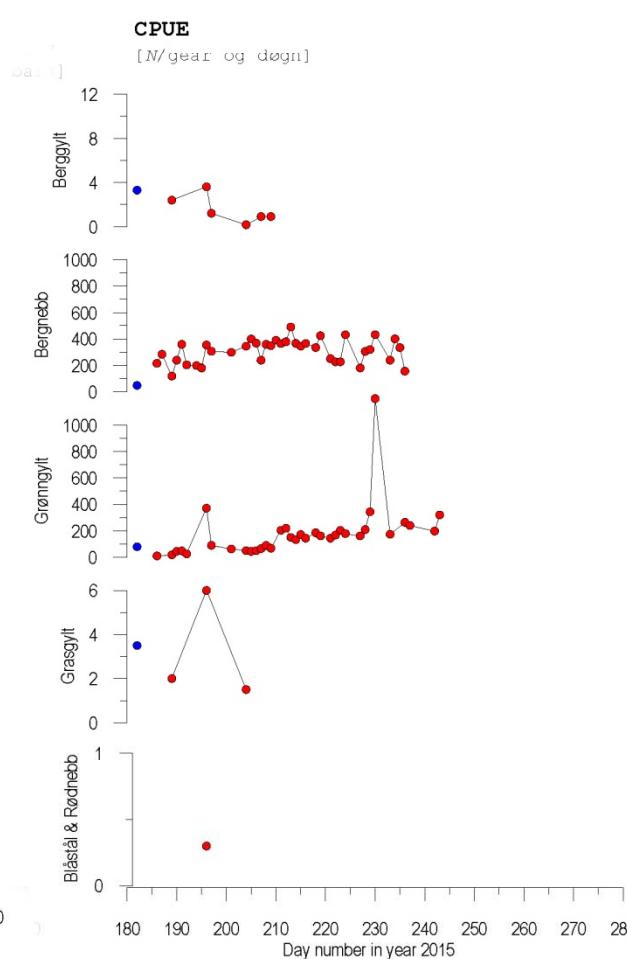
J.I.Olsen²⁰¹⁶
med flukåpning



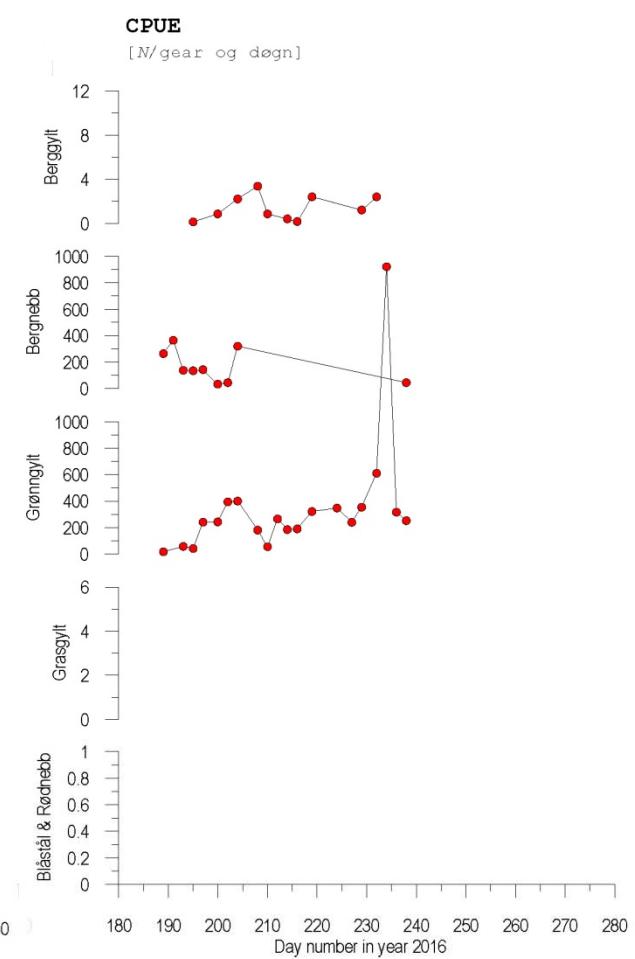
Haraldsen²⁰¹⁴ uten flukåpning [N/N]



Haraldsen²⁰¹⁵ med flukåpning



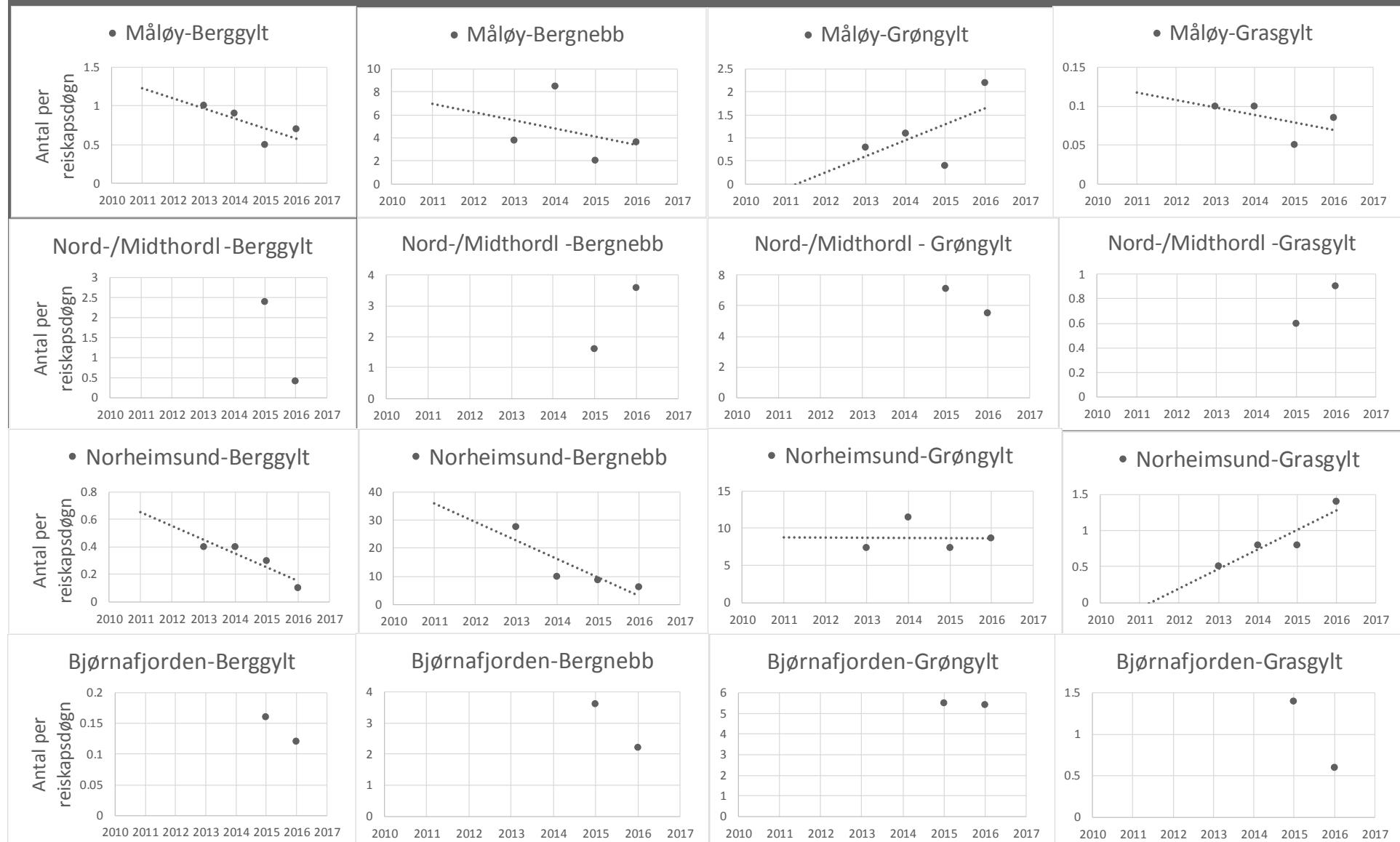
Haraldsen²⁰¹⁶ med flukåpning



Gjennomsnittlige CPUE verdier per fisker: kun redskaper med fluktåpning, bare tre arter Sortert nord til sør.

Hvem?	År	Redskap	Berggylt beholdt						Bergnebb beholdt						Grønngylt beholdt					
			total		m		σ		total		m		σ		total		m		σ	
			m	σ	m	σ	m	σ	m	σ	m	σ	m	σ	m	σ	m	σ		
Lars Mårvik	2015	Teiner	0,06	-77	0,06	-77	0	0	5,26	0,54	4,24	0,49	101,78	11,78	0	0	0	0		
Lars Mårvik	2016	Teiner	0,01	-77	0,01	0	0	0	4,01	0,2	3,85	0,2	92,45	4,86	0,02	0	0,01	0		
Nils Marius Holm	2014	Teiner	0,12	-77	0,13	-77	0	0	57,35	3,23	53,08	2,99	1273,91	71,74	0,12	0,03	0,12	0,03		
Nils Marius Holm	2015	Teiner	1,5	0,11	1,42	0,11	0,09	0,01	8,3	0,5	6,79	0,36	162,95	8,75	0,47	0,06	0,12	0,02		
Nils Marius Holm	2016	Teiner	1,05	0,13	0,96	0,09	0,09	0,06	14,03	1,05	9,17	0,47	220,06	11,27	1,3	0,37	0,94	0,26		
Leif A Dyngvold	2015	Ruser	2,05	0,26	1,9	0,24	0,21	0,02	6,26	0,52	0	0	0	0	24,34	1,82	15,67	1,42		
Leif A Dyngvold	2016	Ruser	3,04	0,62	2,54	0,6	0,5	0,06	4,8	0,73	0,73	0,18	17,55	4,25	27,21	3,12	16,19	1,44		
R, Søviknes	2016	Teiner	1,47	0,08	1,13	0,07	0,35	0,02	12,92	0,76	10,37	0,64	248,94	15,45	11,9	0,81	9,49	0,64		
Jonny Tøkje	2014	Teiner	0,09	0,01	0,08	0,01	0,2	-77	4,81	0,44	1,66	0,18	39,78	4,29	6,37	0,56	3,2	0,31		
Jonny Tøkje	2015	Teiner	0,14	0,01	0,14	0,01	0,07	-77	5,24	0,18	2,35	0,11	56,42	2,53	7,37	0,36	3,2	0,14		
Jonny Tøkje	2016	Teiner	0,13	0,02	0,13	0,02	0,02	-77	14,16	1,47	3,68	0,63	88,36	15,17	16,1	1,16	5,02	0,42		
Andreas Lund	2014	Teiner	0,66	0,04	0,59	0,04	0,12	0,01	16,38	0,71	7,77	0,44	186,44	10,46	10,56	0,99	1,74	0,08		
Andreas Lund	2015	Teiner	0,64	0,03	0,62	0,03	0,13	0,02	5,81	0,36	2,92	0,21	70,13	5,1	5,47	0,49	2,97	0,21		
Andreas Lund	2016	Teiner	0,67	0,06	0,64	0,06	0,08	0,01	8,21	0,85	2,9	0,28	69,72	6,63	7,27	1,23	4,94	0,47		
Andreas Lund	2016	Teiner	0,51	0,12	0,51	0,12	0	0	12,46	2,27	3,82	0,57	91,6	13,74	4,28	1,78	2,48	0,86		
Thor Gunnar Olsen	2016	Teiner	0,95	0,06	0,93	0,06	0,02	0	12,48	0,71	6,94	0,34	166,67	8,08	6,92	0,43	3,74	0,34		
Jan Ivar Olsen	2015	Ruser	5,1	0,48	2,29	0,16	3,36	0,38	11,43	1,16	3,15	0,32	75,69	7,73	22	1,61	8,87	1,04		
Jan Ivar Olsen	2016	Ruser	3,18	0,38	1,61	0,24	1,69	0,2	12,63	1	3,35	0,35	80,39	8,45	23,04	1,59	11,41	1,03		
Jan Ivar Olsen	2015	Teiner	0	0	0	0	0	0	37,94	3,77	17,7	1,66	424,77	39,94	2,56	0,27	1,23	0,1		
Jan Ivar Olsen	2016	Teiner	0	0	0	0	0	0	50,91	4,68	18,17	1,65	436,13	39,52	2,8	0,35	0,99	0,08		
Vidar Mikkelsen	2016	Ruser	2,25	0,36	1,39	0,17	1,47	0,26	7,79	1,47	3,47	0,79	83,27	18,88	62,75	7,87	30,22	4,38		
Vidar Mikkelsen	2016	Teiner	1	-77	1	-77	0	0	74,04	19,96	52,62	15,26	1262,88	366,15	14,48	3,42	10,44	3,09		
John Harald Haraldsen	2015	Ruser	3,3	-77	3	-77	0,3	-77	50	-77	0	0	0	0	80	-77	5	-77		
John Harald Haraldsen	2015	Teiner	1,53	0,51	1,23	0,4	0,44	0,16	310,66	14,28	93,92	5,85	2254,07	140,44	177,69	33,88	64,09	29,22		
John Harald Haraldsen	2016	Teiner	1,39	0,36	1,24	0,32	0,38	0,16	165,38	41,18	43,55	14,17	1045,2	339,96	343,83	101,39	122,53	20,64		

Fangstrater fra Kystreferanseflåten (ref. fiskere markert med grønn sirkel på kart i lysark nr 4)



Konklusjoner (CPUE 2014 – 2016)

- Store CPUE variasjoner mellom artene for alle tre CPUE variablene.
- Store CPUE variasjoner mellom forskjellige landsdeler (nord / sør; innenfor en art) for alle tre CPUE variablene, ofte en økning mot sør.
- Det finnes ingen entydig tegn for bestandspåvirkning som konsekvens av den intense fiskeriaktiviteten, men nedadgående trend i fangstrater av berggylt og bergnebb hos noen fiskere på Vestlandet (Kystreferanseflåten) får Havforskningsinstituttet til å anbefale at kvoten for Vestlandet for 2016 på 10 millioner leppefisk også settes som kvotetak for 2017.
- For Sørlandet og området nord for Stad anbefaler Havforskningsinstituttet ingen økning i fiskeinnsats eller kvote for 2017.

...takk



Hvor er Tøkje ???

Returnerer han til steder hvor:

- det er lett å fange fisk (høy CPUE)?
- han får mye fisk han kan selge (høy $N_{beholdt}$)??

Tøkje 2016

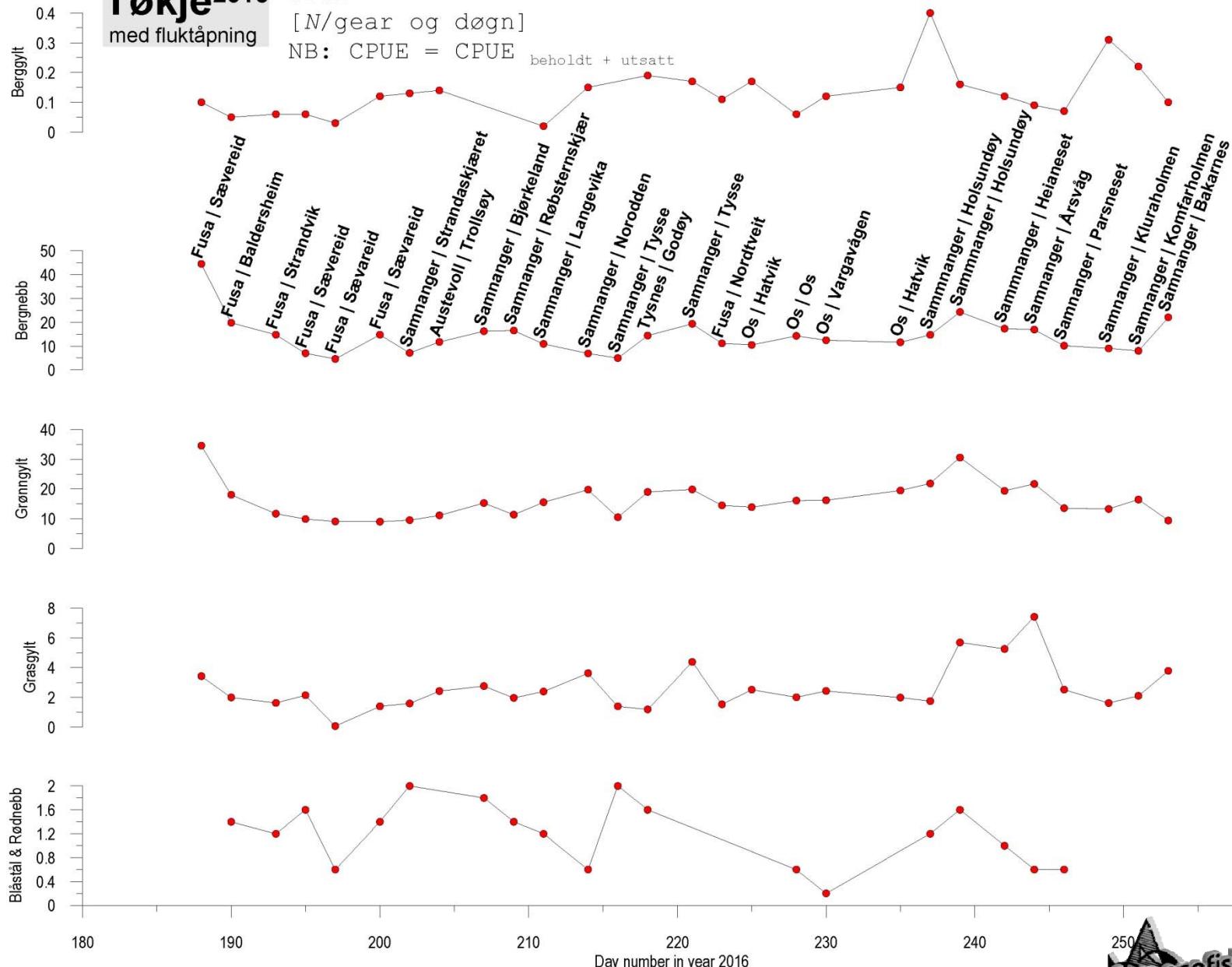
med fluktåpning

CPUE

[N/gear og døgn]

NB: CPUE = CPUE

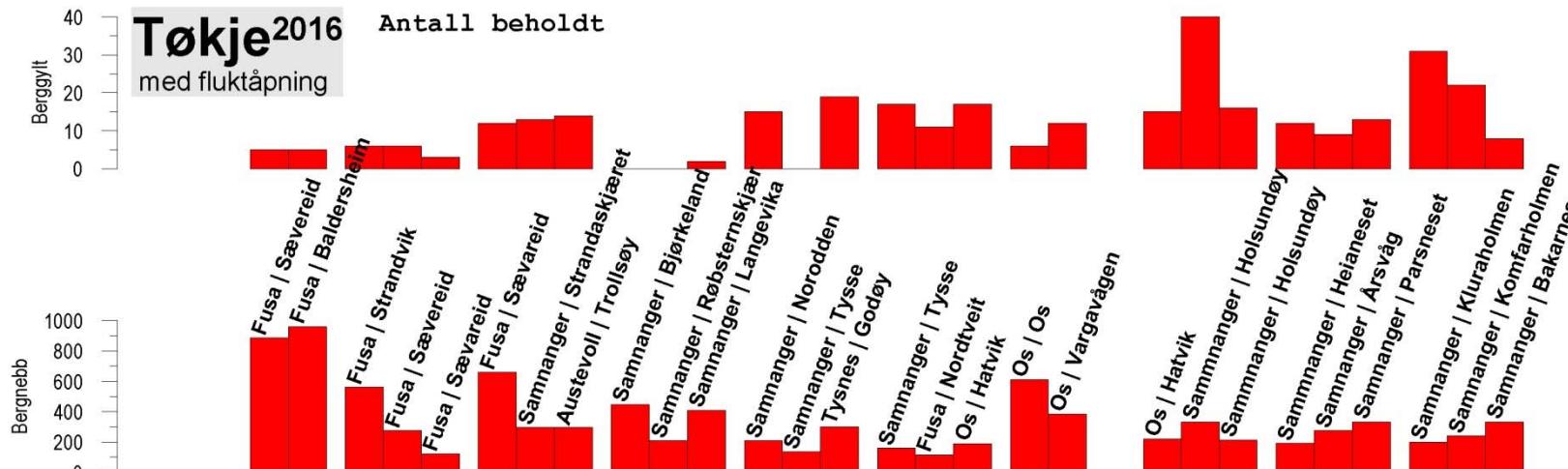
beholdt + utsatt



Tøkje 2016

med fluktåpning

Antall beholdt



Day number in year 2016