Langtidseffekter av forsuring og kalkingstiltak på innsjøgytende aure i Store Hovvatn og Vegår

Bjørn T. Barlaup & Einar Kleiven

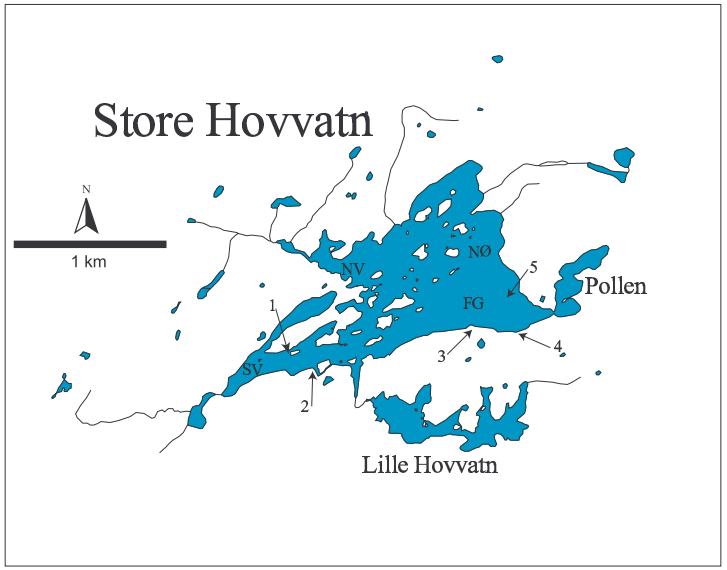
NIVA-rapport LNR 5480-2007

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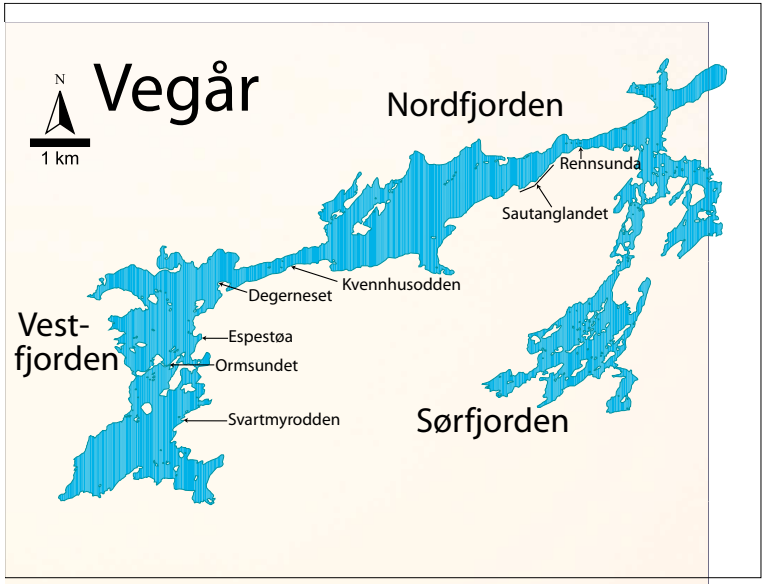
Store Hovvatn

- Innsjøareal: 1,18 km^2
- 494 moh.
- Kalket siden 1981



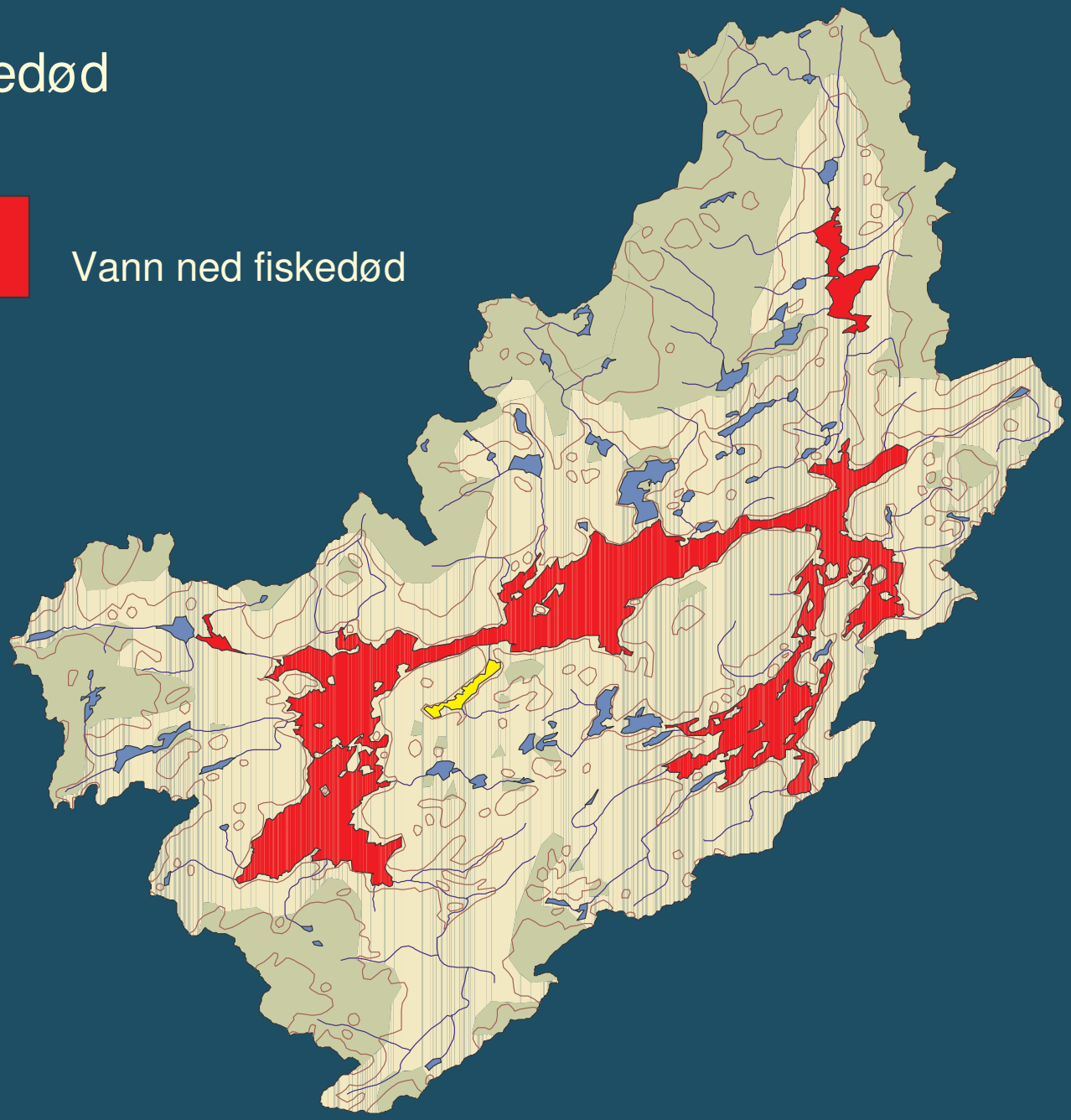
Vegår

- Innsjøareal: 18,3 km^2
- 189 moh.
- Kalket siden 1985



Vegår - fiskedød

Vann ned fiskedød

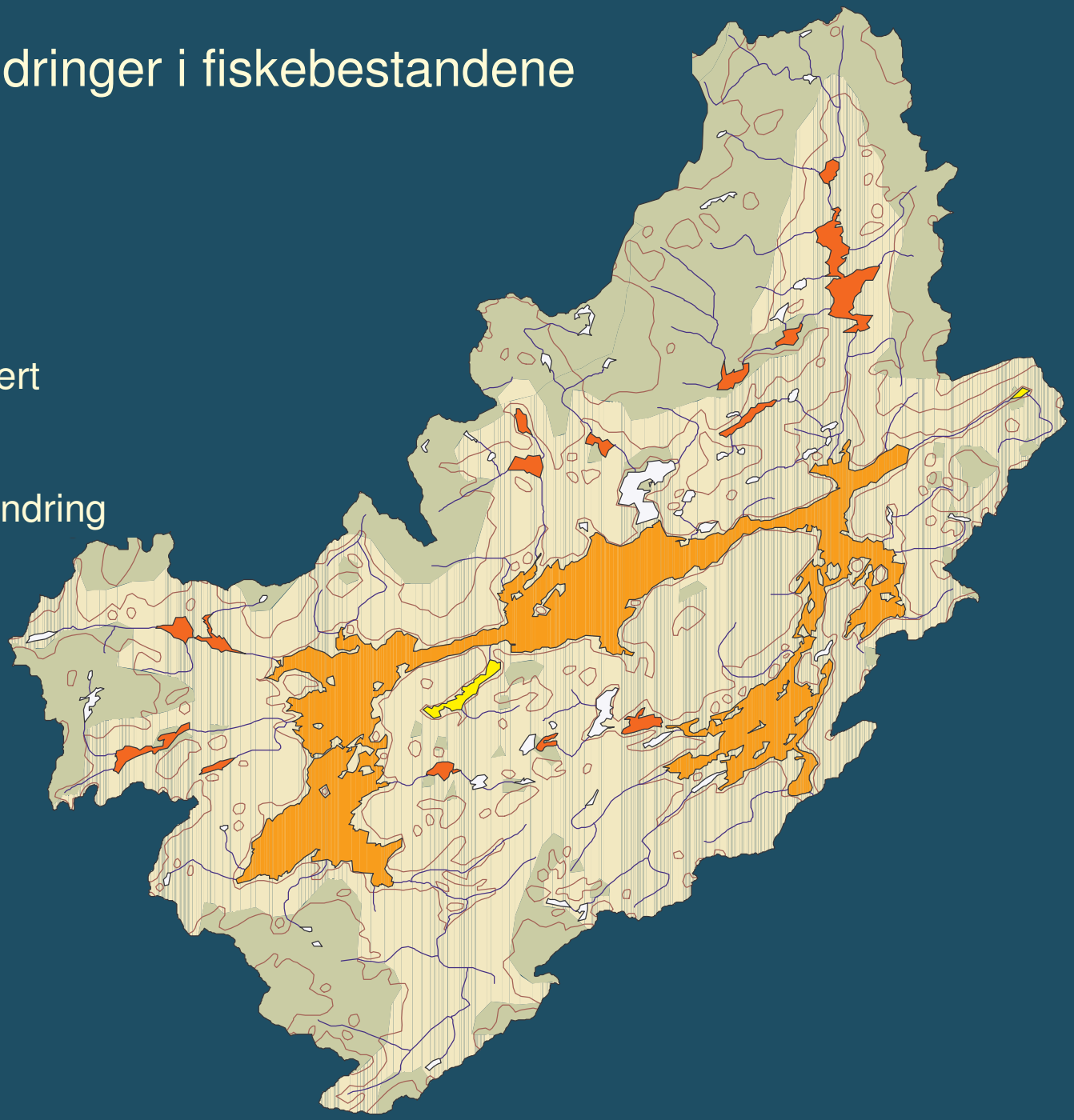


Vegår - endringer i fiskebestandene

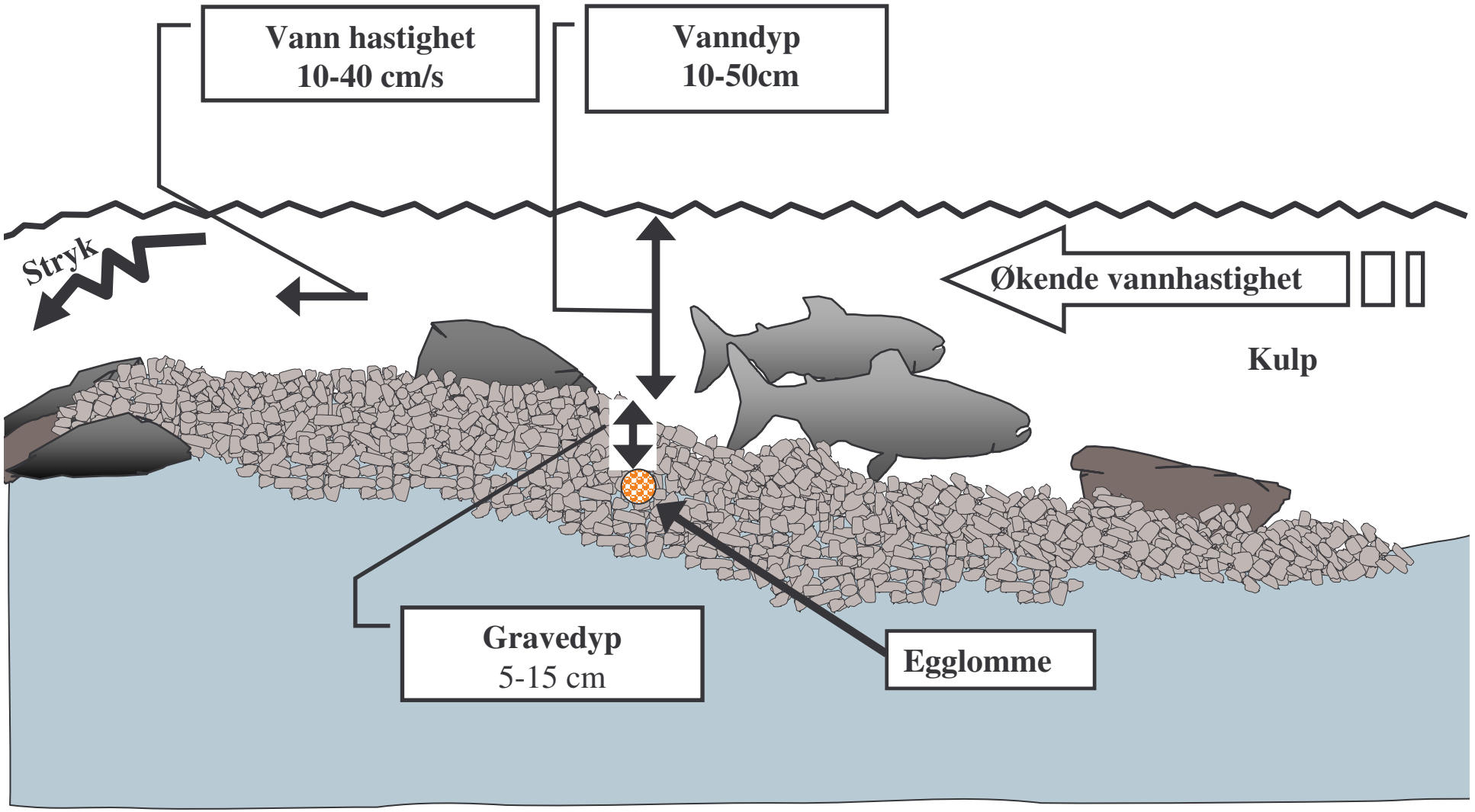
Utdødd

Redusert

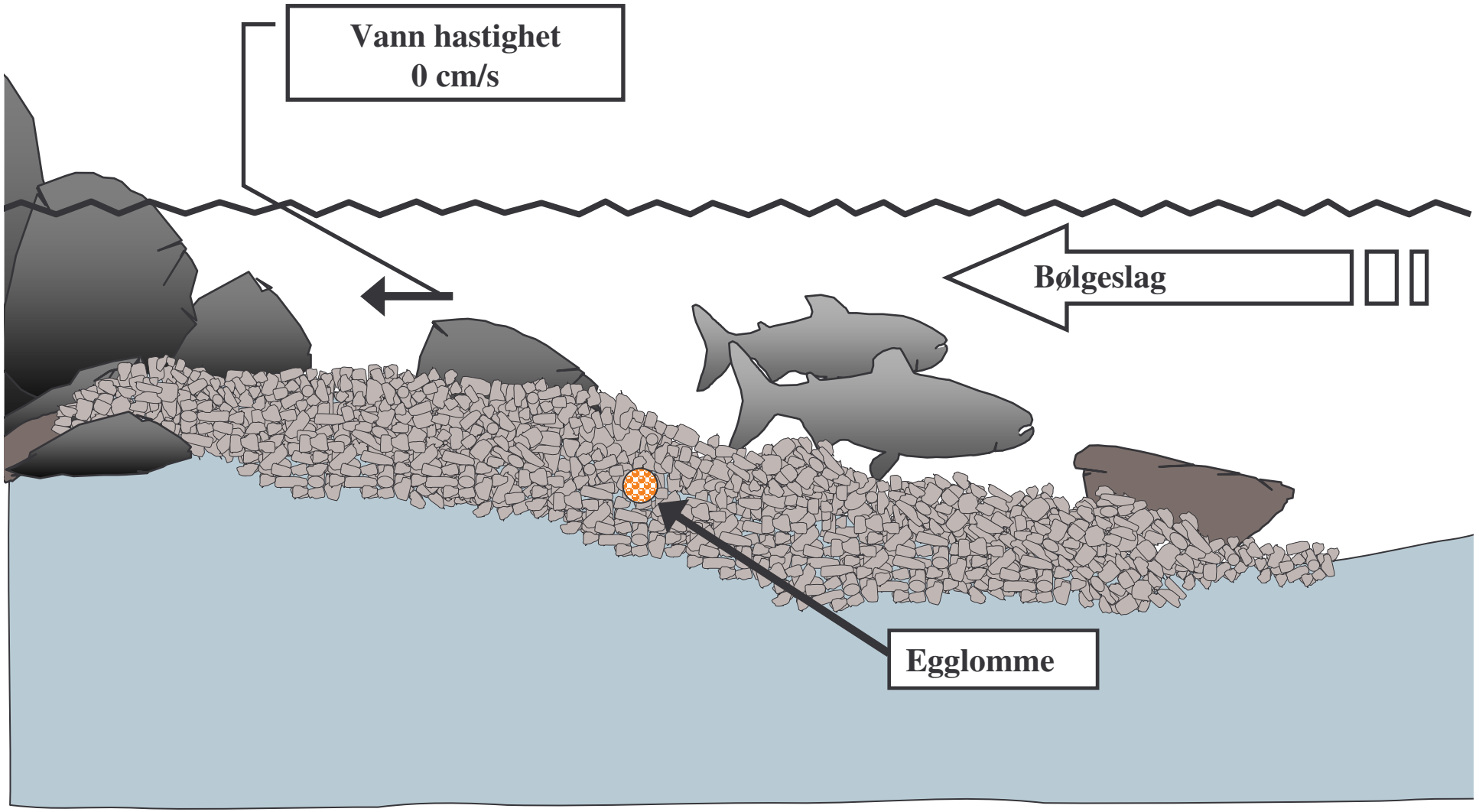
Ingen endring



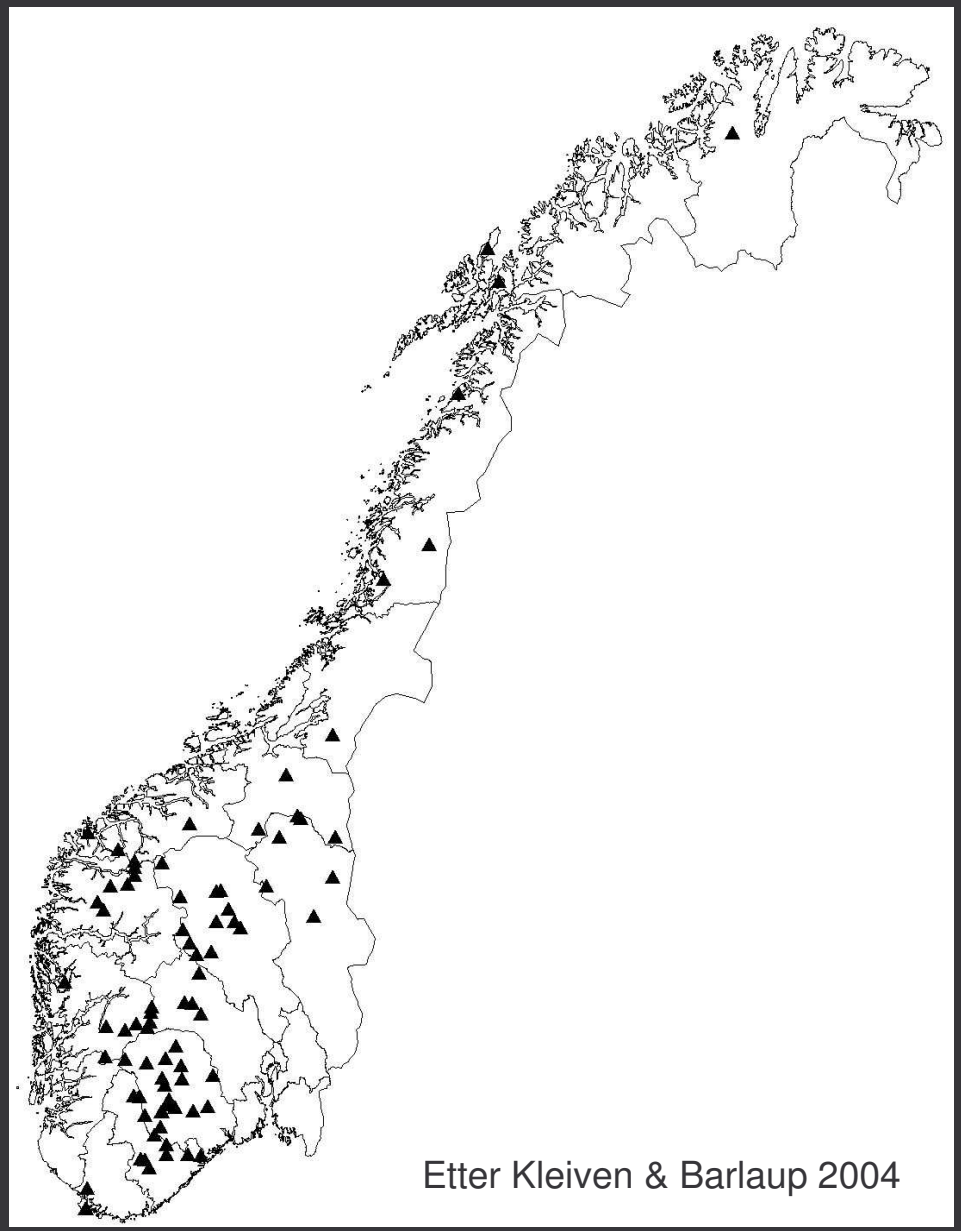
Normalt gyter auren på rennende vann i bekker og elver



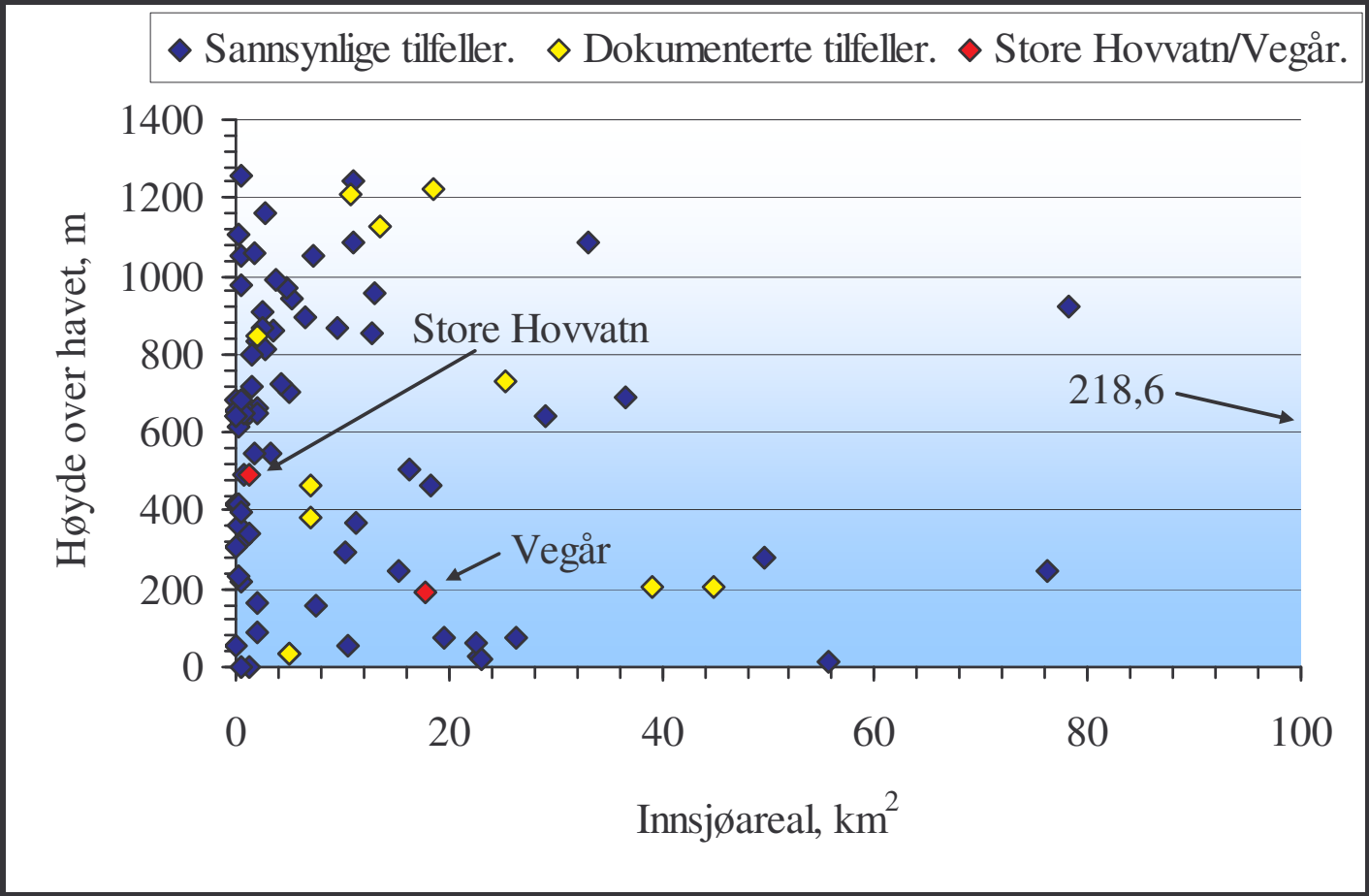
Men auren kan også gyte på stillestående vann i littoralsonen av innsjøen



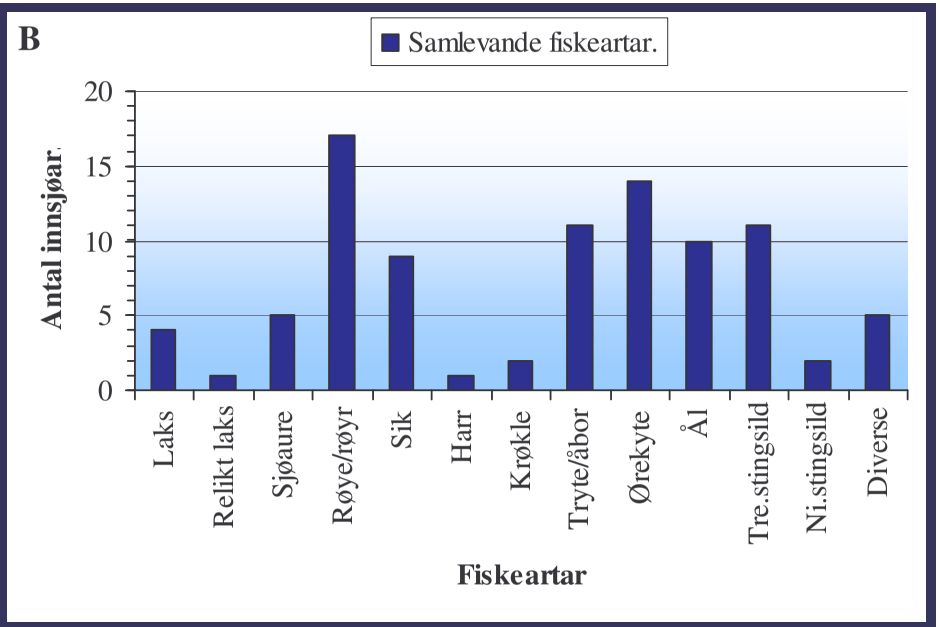
Totalt 86 innsjøer med innrapporterte tilfeller av innsjøgyting hos aure



Etter Kleiven & Barlaup 2004



Etter Kleiven & Barlaup 2004

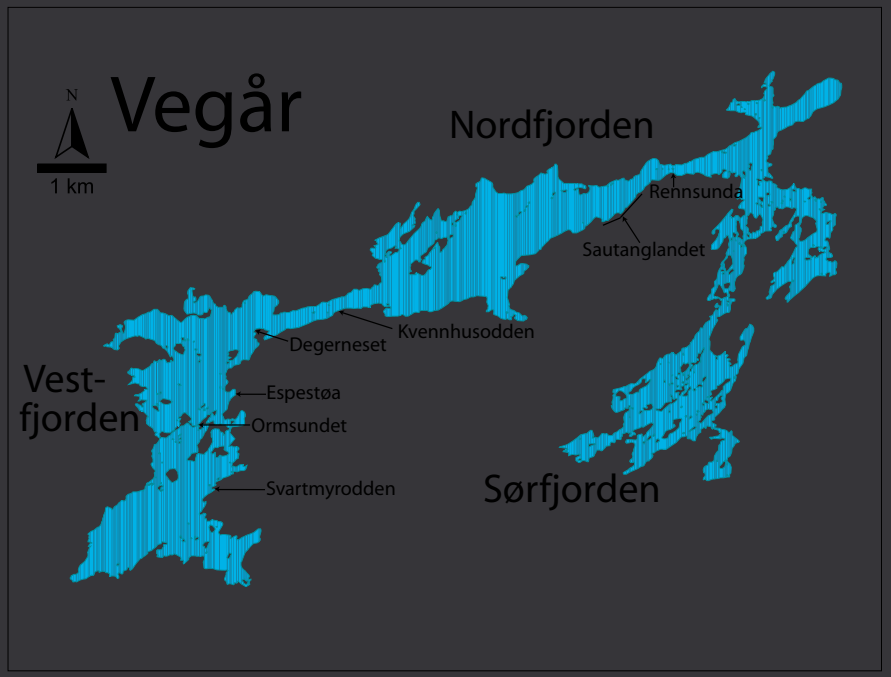

B
Samlevande fiskeartar.
Antal innsjøar
20
15
10
5
0
Laks
Relikt laks
Sjøaure
Røye/røyr
Sik
Harr
Krøkle
Tryte/åbor
Ørekyte
Ål
Tre.stingsild
Ni.stingsild
Diverse
Fiskeartar


NV
NØ
FG
SV







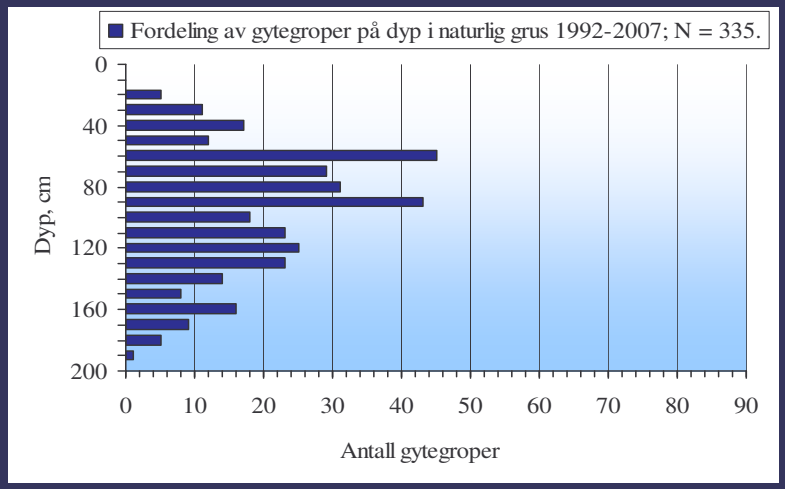

N
Vegår
1 km
Nordfjorden
Rennsunda
Sautanglandet
Kvennhusodden
Degerneset
Vest-
fjorden
Espestøa
Ormsundet
Svartmyrodden
Sørfjorden

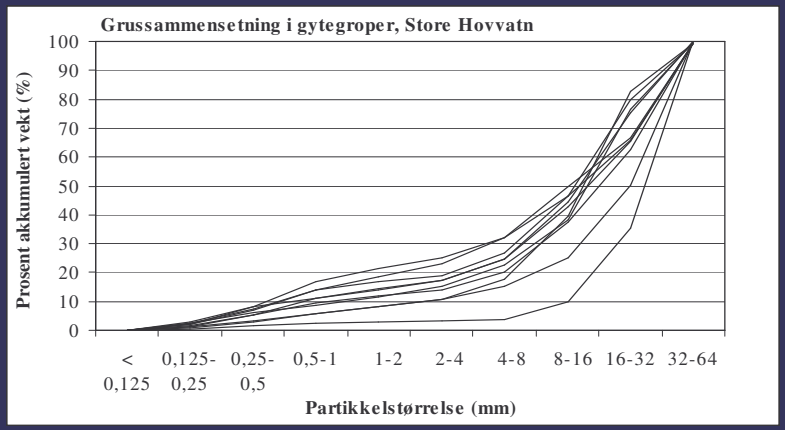




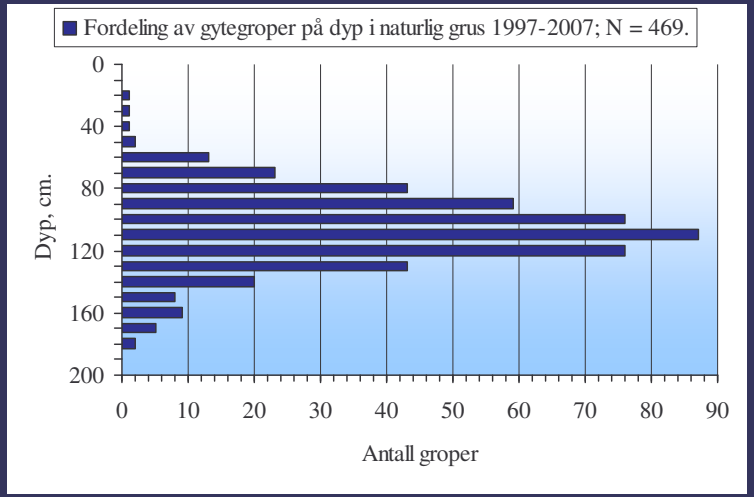


Store Hovvatn



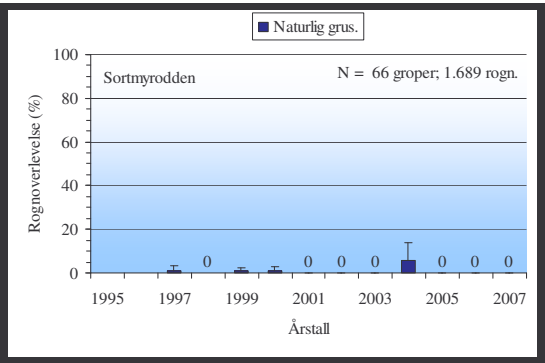


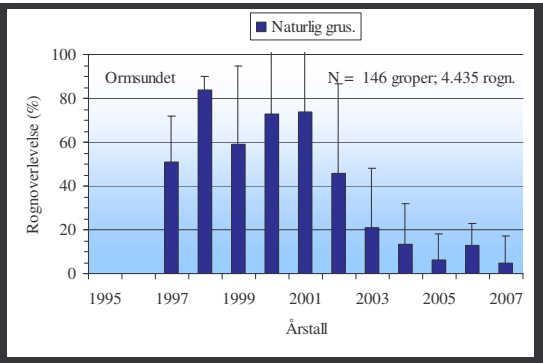
Vegår

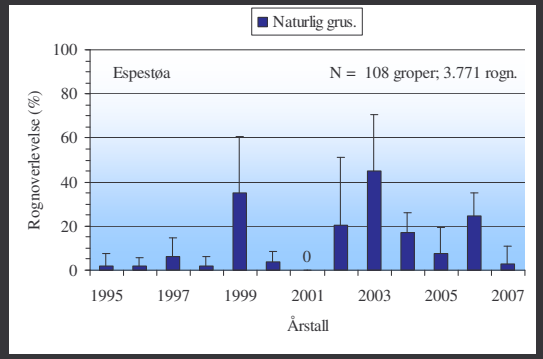

Fordeling av gytegroper på dyp i naturlig grus 1997-2007; N = 469.
Dyp, cm.
0
40
80
120
160
200
0
10
20
30
40
50
60
70
80
90
Antall groper

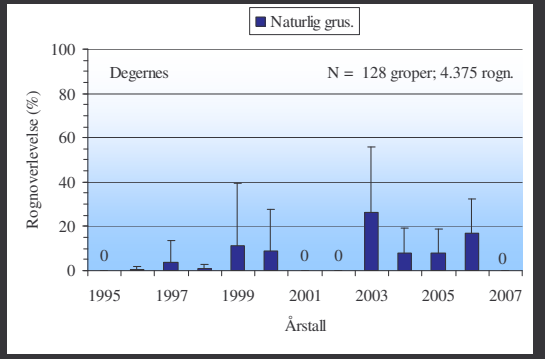
Unormalt høy dødelighet for rogn gytt i strandsonen av Vegår og Store Hovvatn

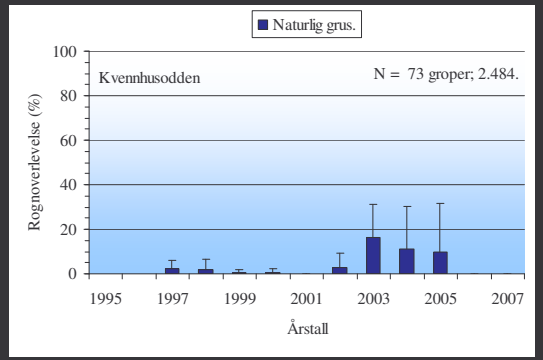
Overlevelse av rogn på sju gyteplasser i Vegår

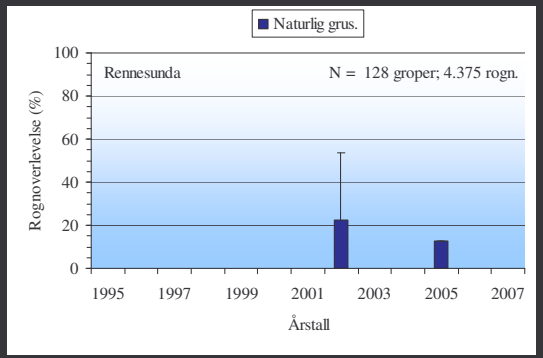


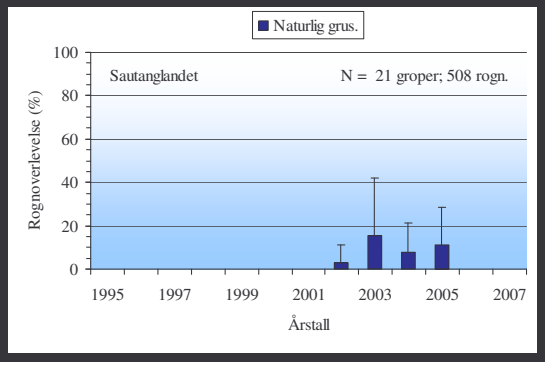




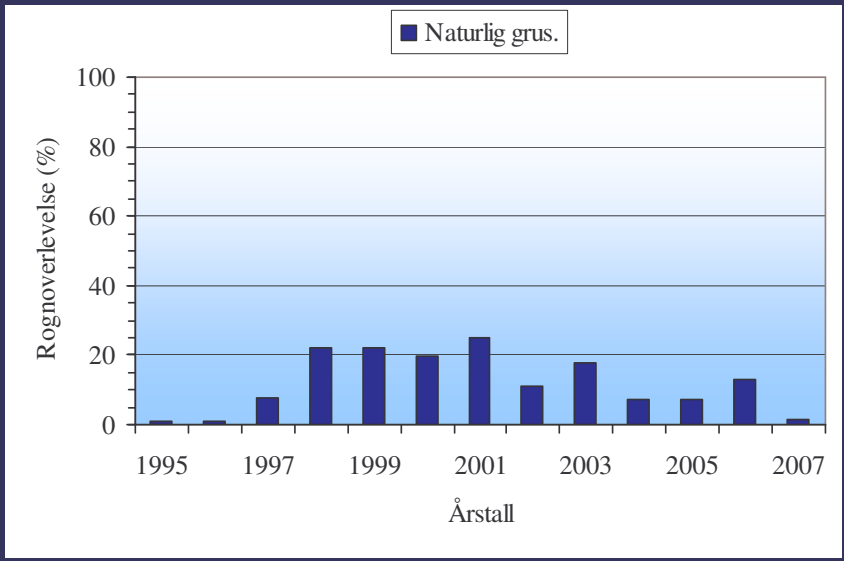




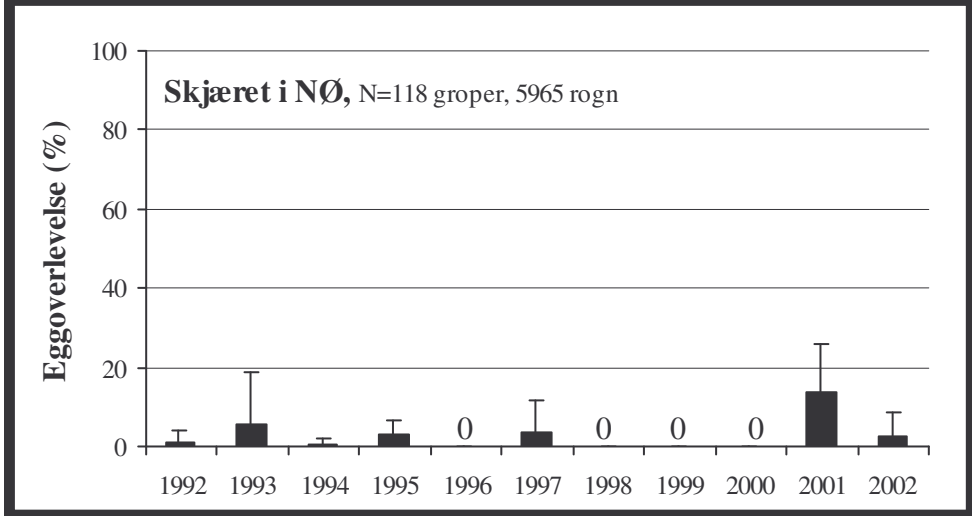




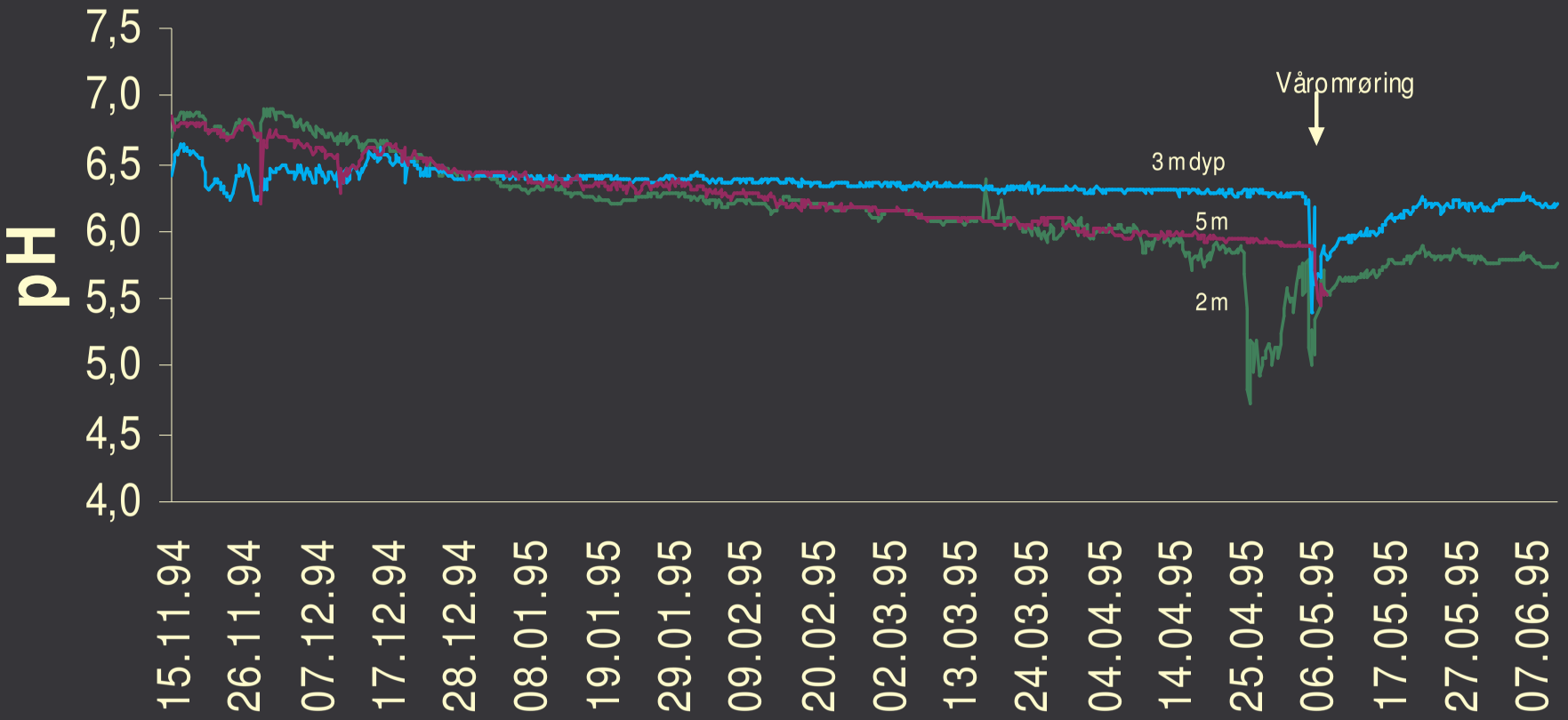
Vegår


Naturlig grus.
100
80
60
40
20
0
Rognoverlevelse (%)
1995
1997
1999
2001
2003
2005
2007
Årstall

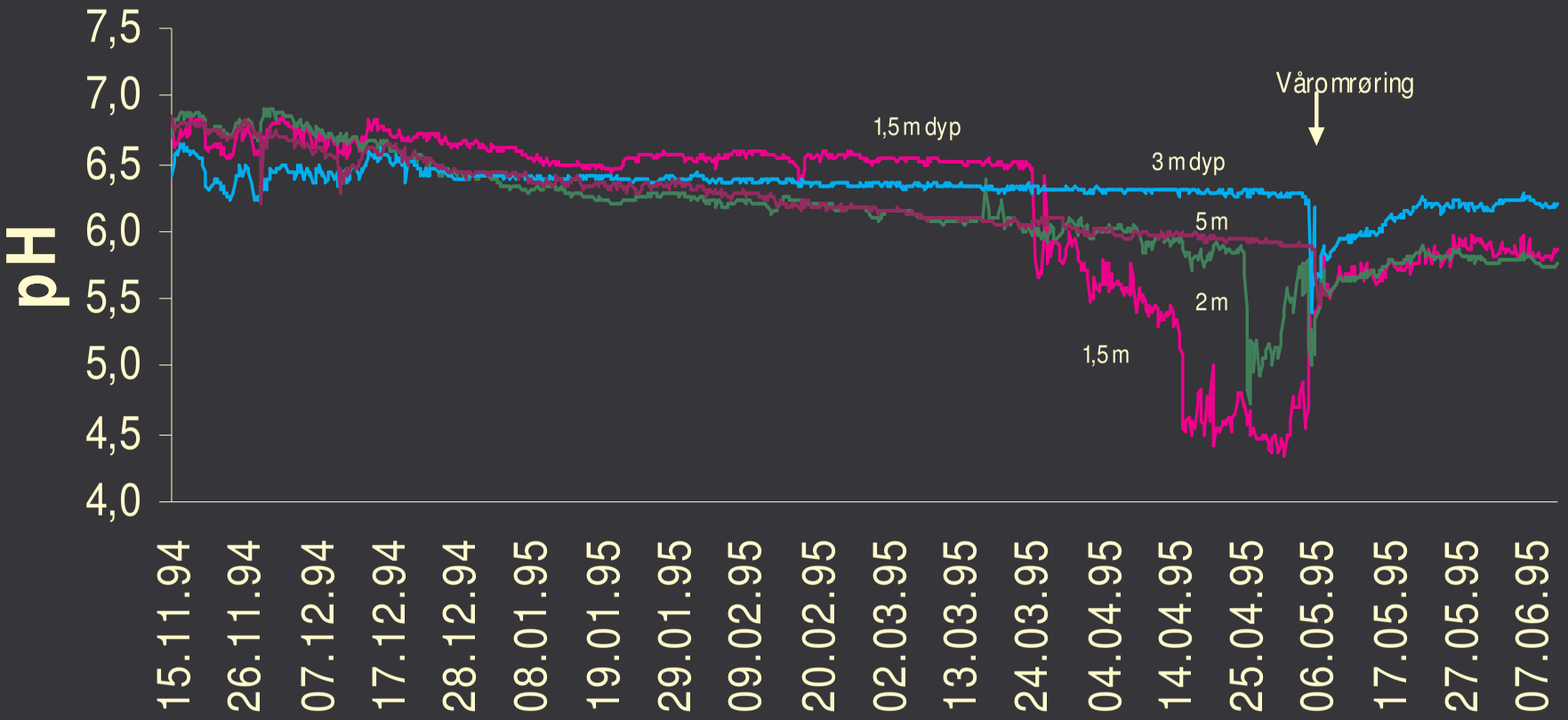
Store Hovvatn



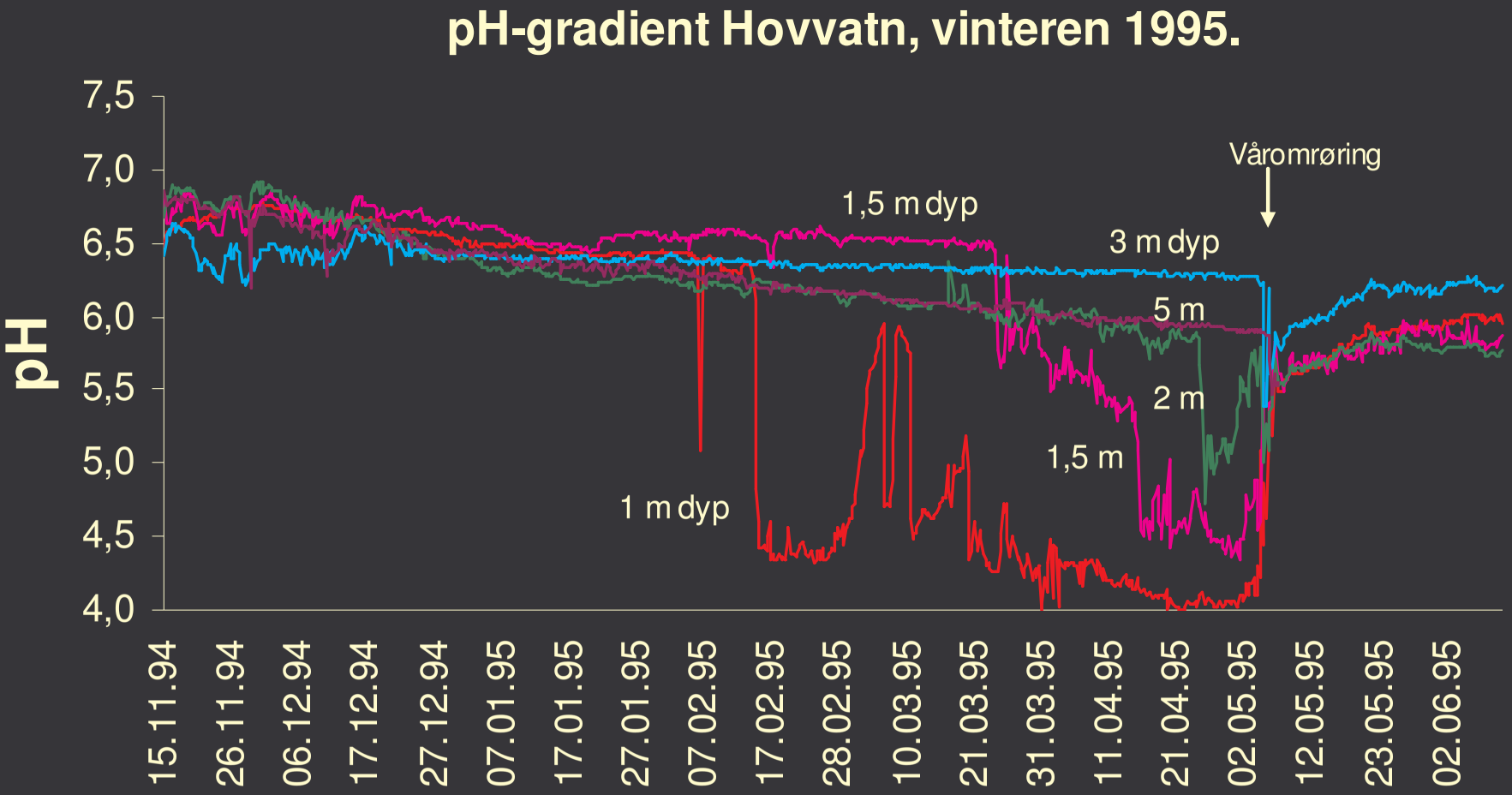
Store Hovvatn



Store Hovvatn



Store Hovvatn



Store Hovvatn

Store Hovvatn ble for første gang terrengkalket i 1999, dose 1 tonn/ha

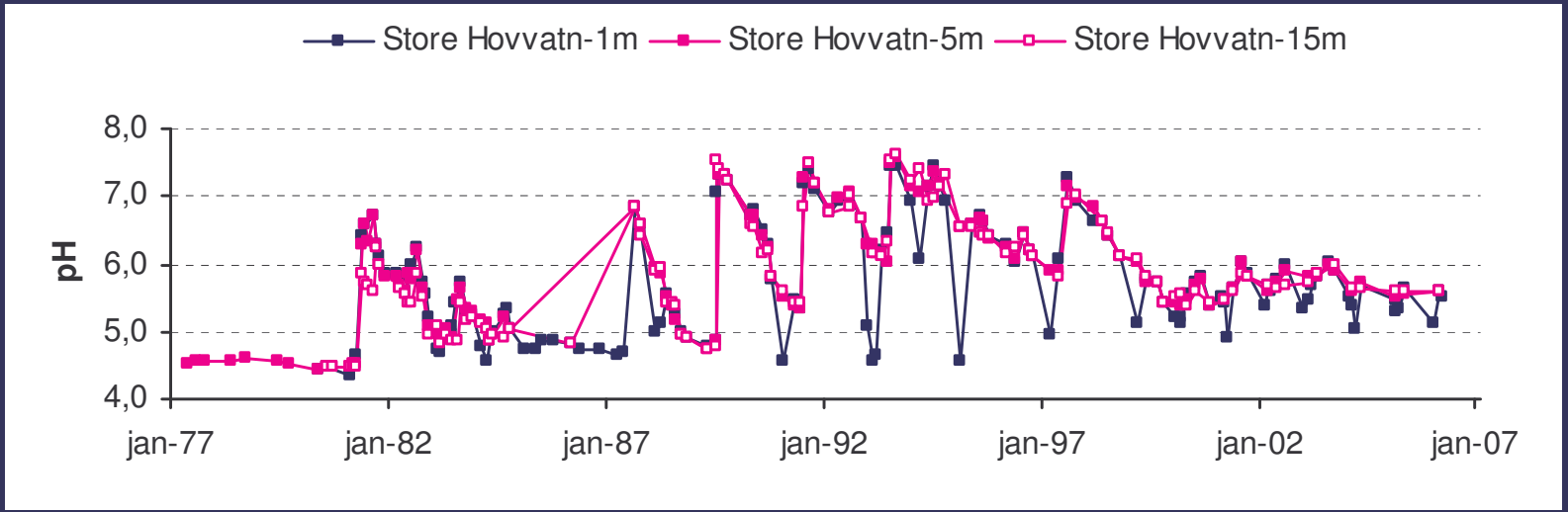
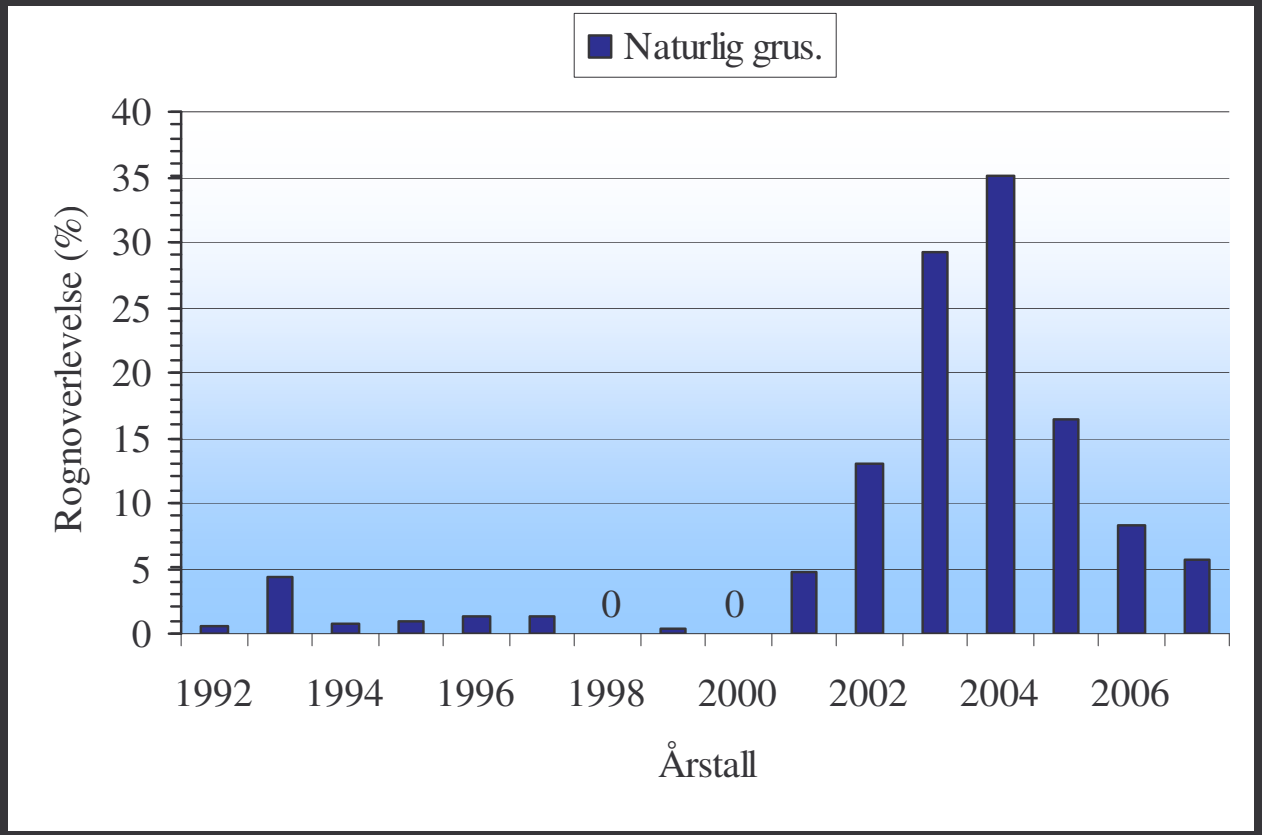


Foto: Øyvind A. Schnell

Store Hovvatn

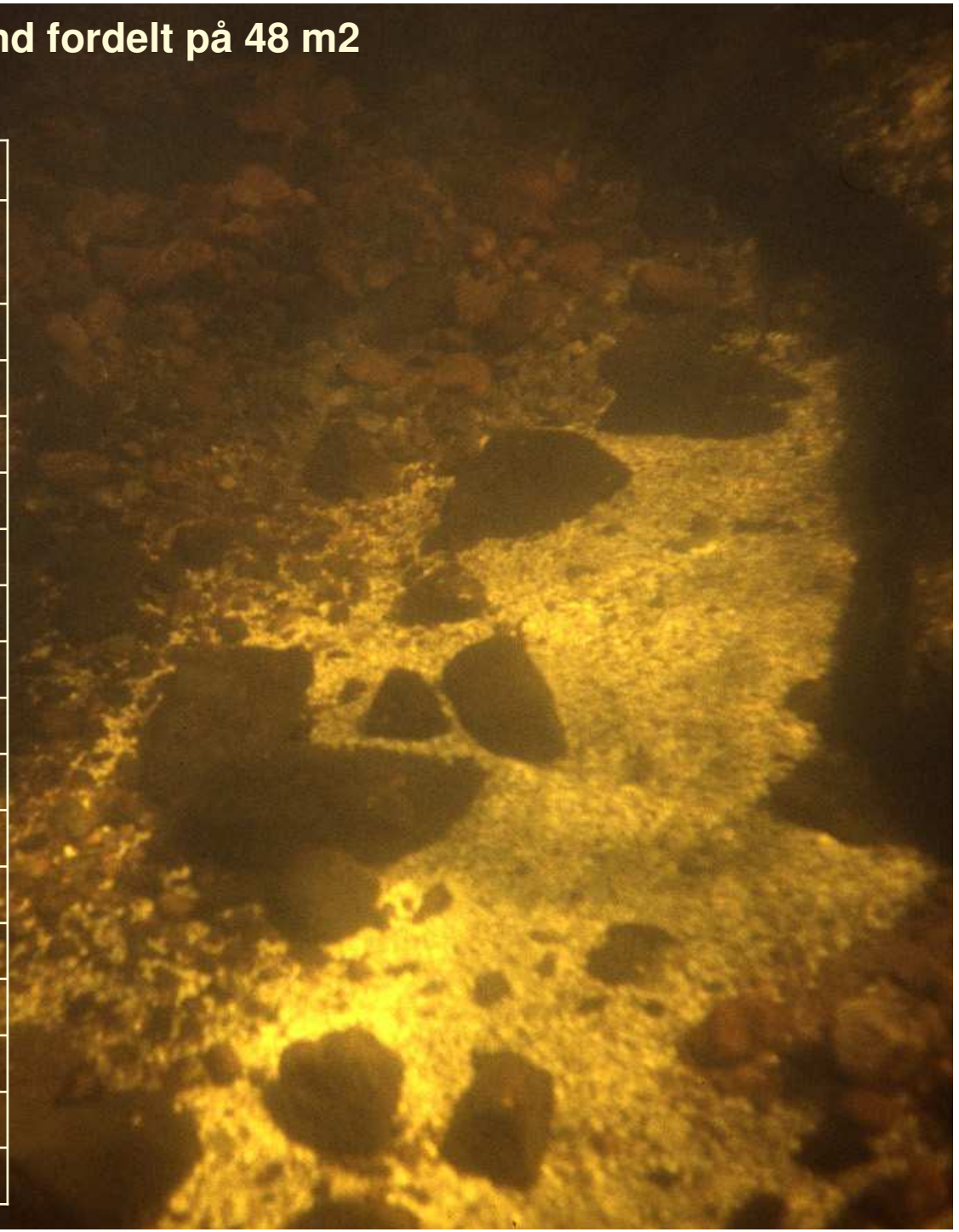
Rognoverlevelse i gytegroper i naturgrus for perioden 1992-2007




Store Hovvatn

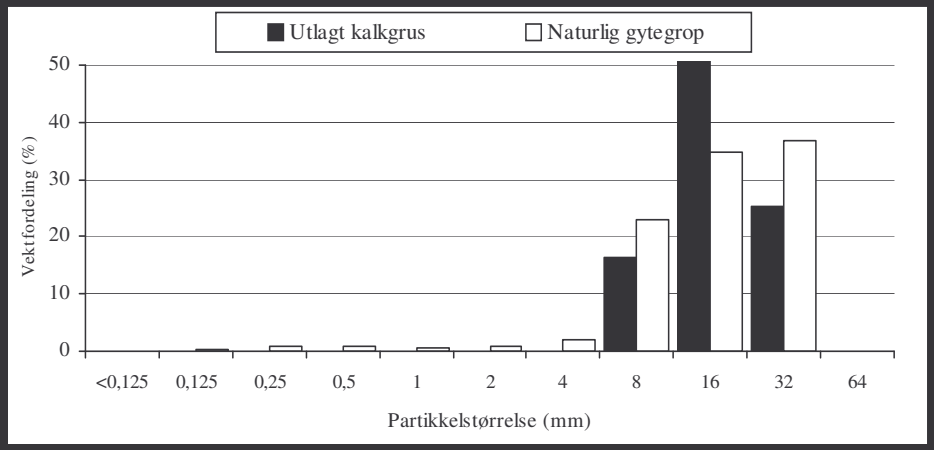
Utlegging av ca 1 tonn skjellsand fordelt på 48 m2 av et gyteområde i august 1992

År	Antall gytegroper	
	Naturlig grus	Skjellsand
1992	37	-
1993	28	0
1994	9	0
1995	7	0
1996	9	0
1997	7	0
1998	2	0
1999	7	0
2000	4	0
2001	3	0
2002	6	0
2003	6	0
2004	4	0
2005	8	0
2006	0	0
2007	1	0



Utlegging av kalkgrus på gyteplassene i Store Hovvatn og Vegår fra høsten 1993/1994

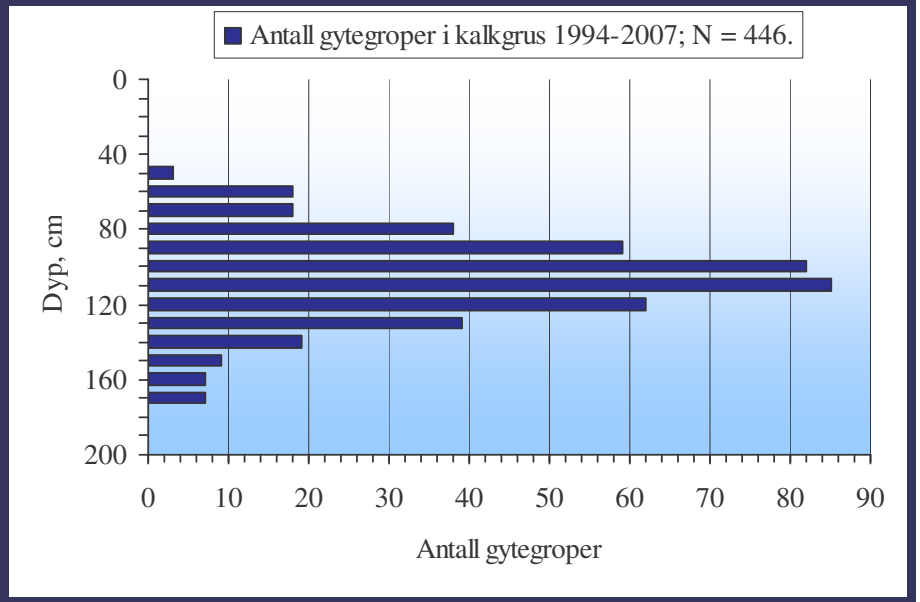




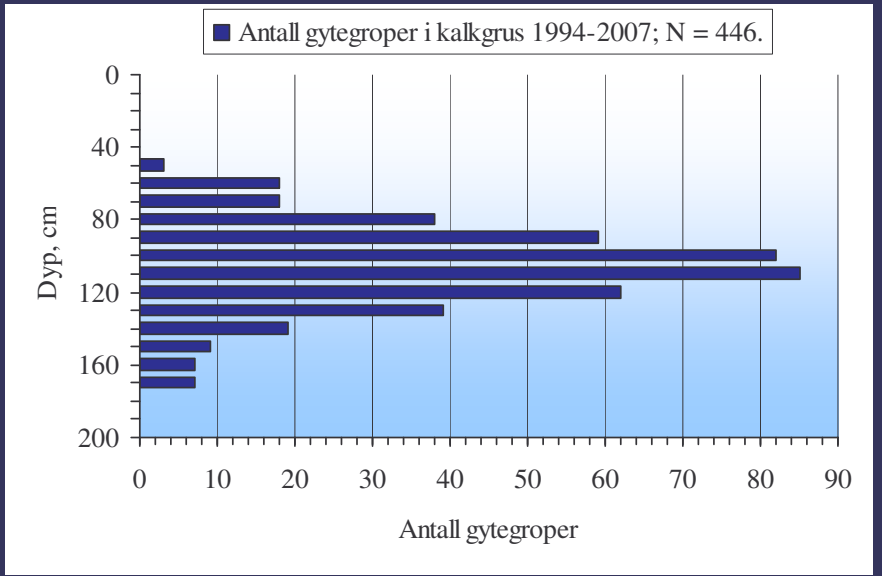
Utlegging av 11 tonn kalkgrus fordelt på ca 60 m² av et gyteområde på omlag 200 m² høsten 1993

År	Antall gytegroper	
	Naturlig grus	Kalkgrus
1992	37	-
1993	28	**
1994	9	14
1995	7	13
1996	9	22
1997	7	21
1998	2	10
1999	7	11
2000	4	15
2001	3	12
2002	6	14
2003	6	11
2004	4	19
2005	8	21
2006	0	6
2007	1	17

Store Hovvatn

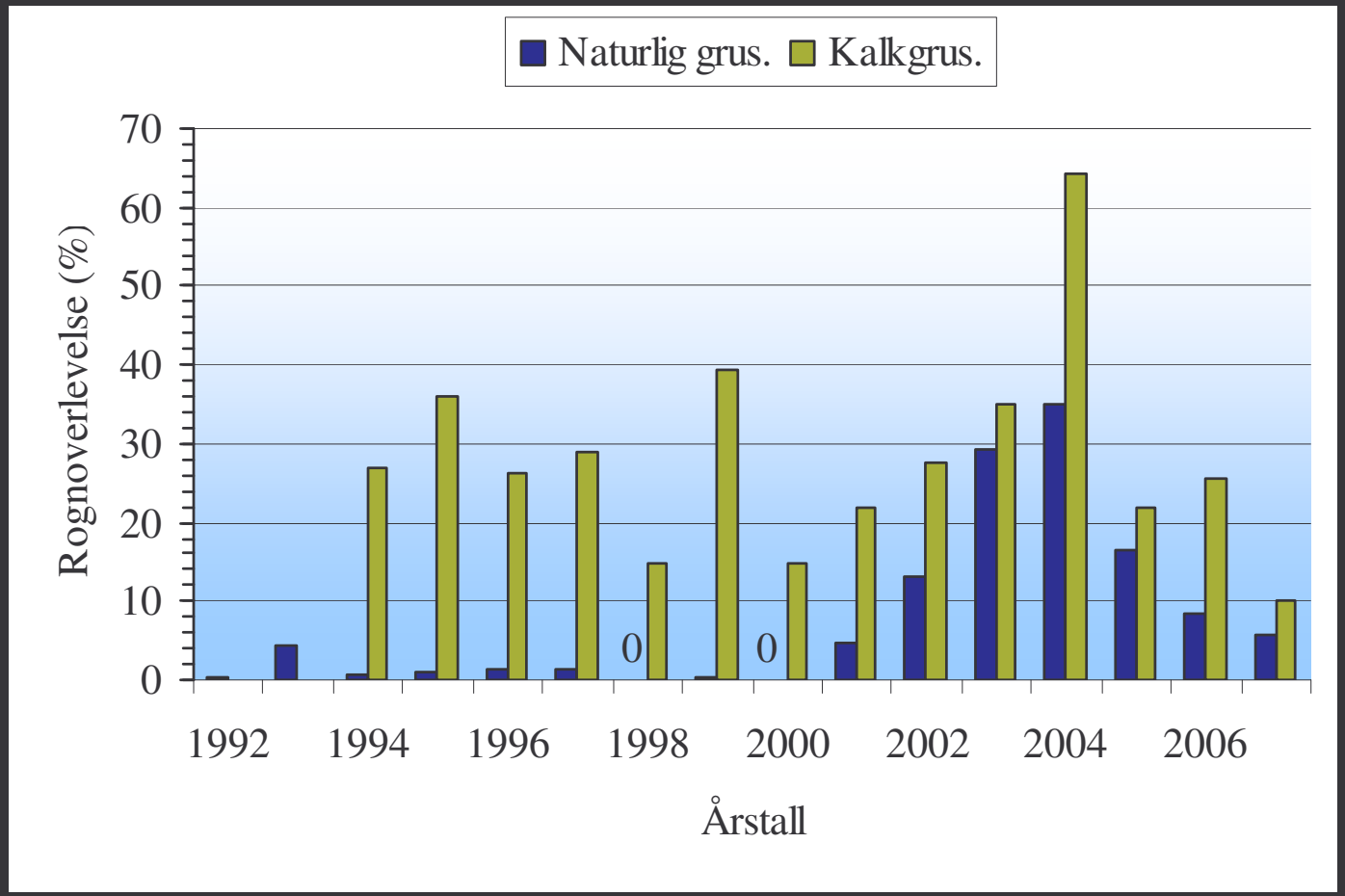


Vegår

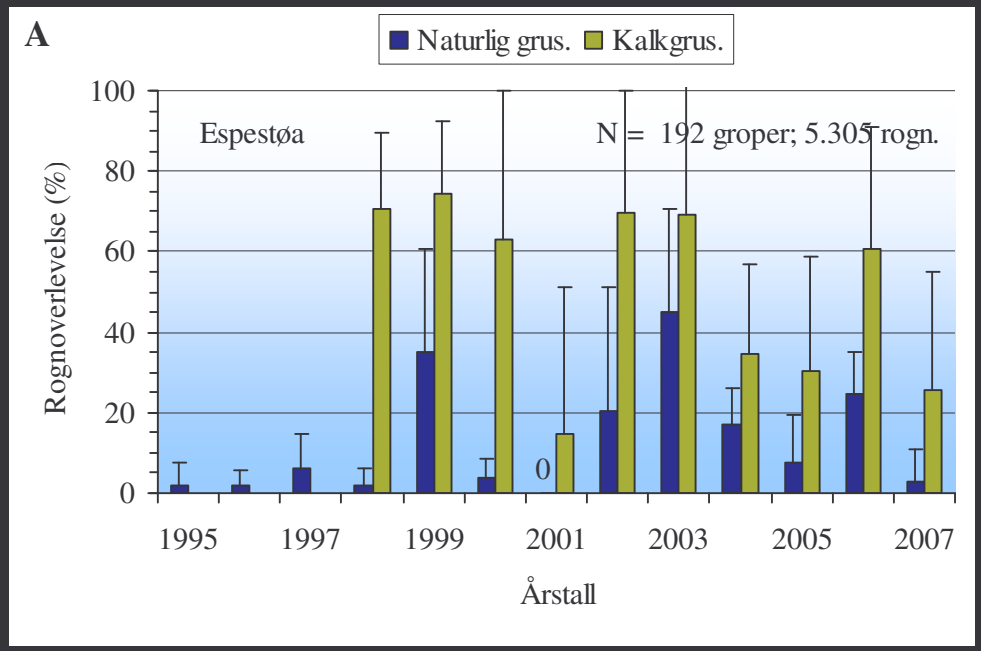

Antall gytegroper i kalkgrus 1994-2007; N = 446.
Dyp, cm
0
40
80
120
160
200
0
10
20
30
40
50
60
70
80
90
Antall gytegroper

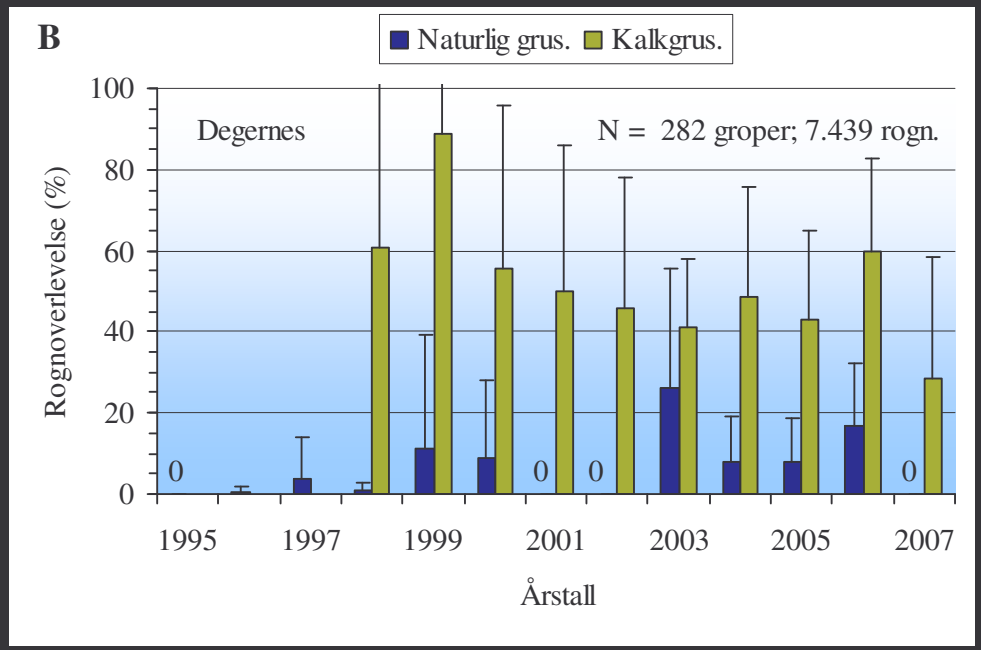
Store Hovvatn

Rognoverlevelse i gytegroper i naturgrus og kalkgrus i Store Hovvatn for perioden 1992-2007

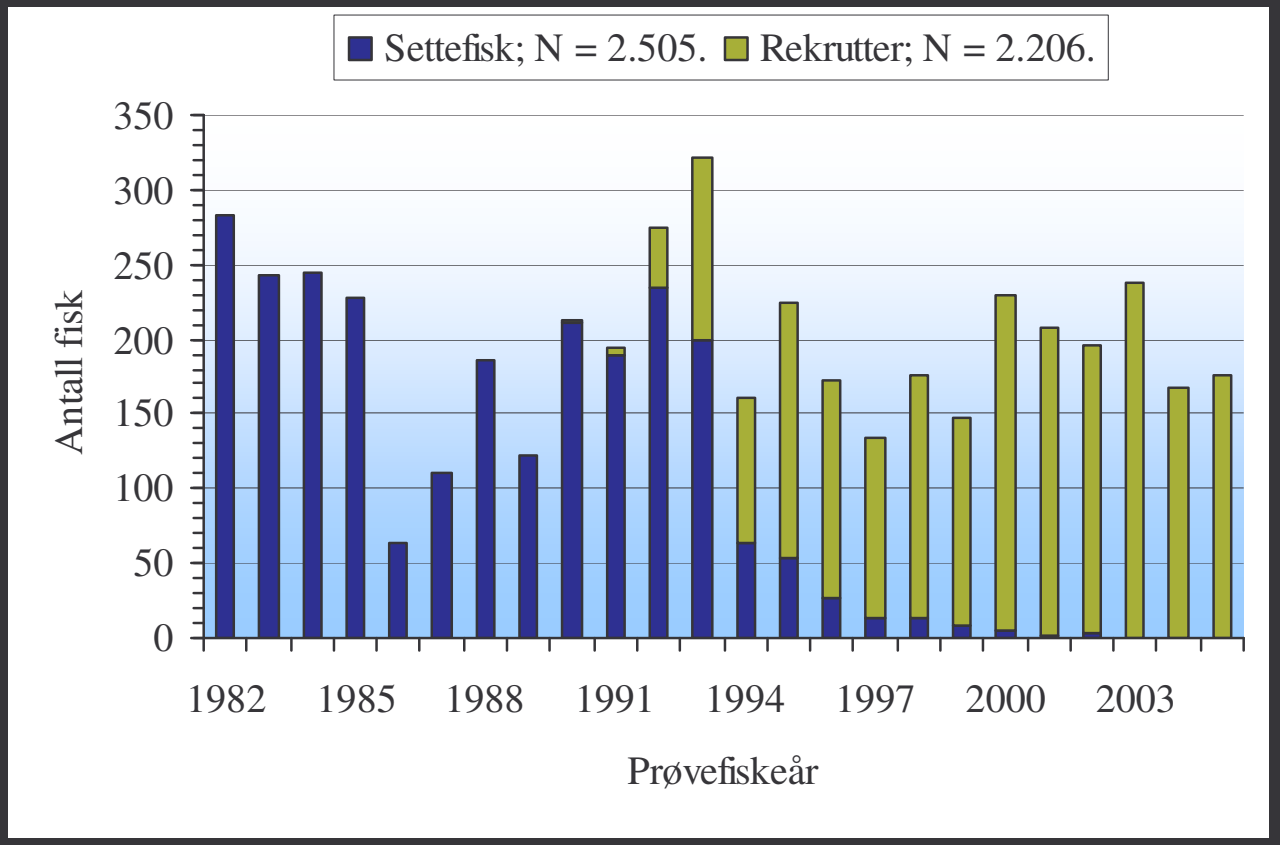


Vegår

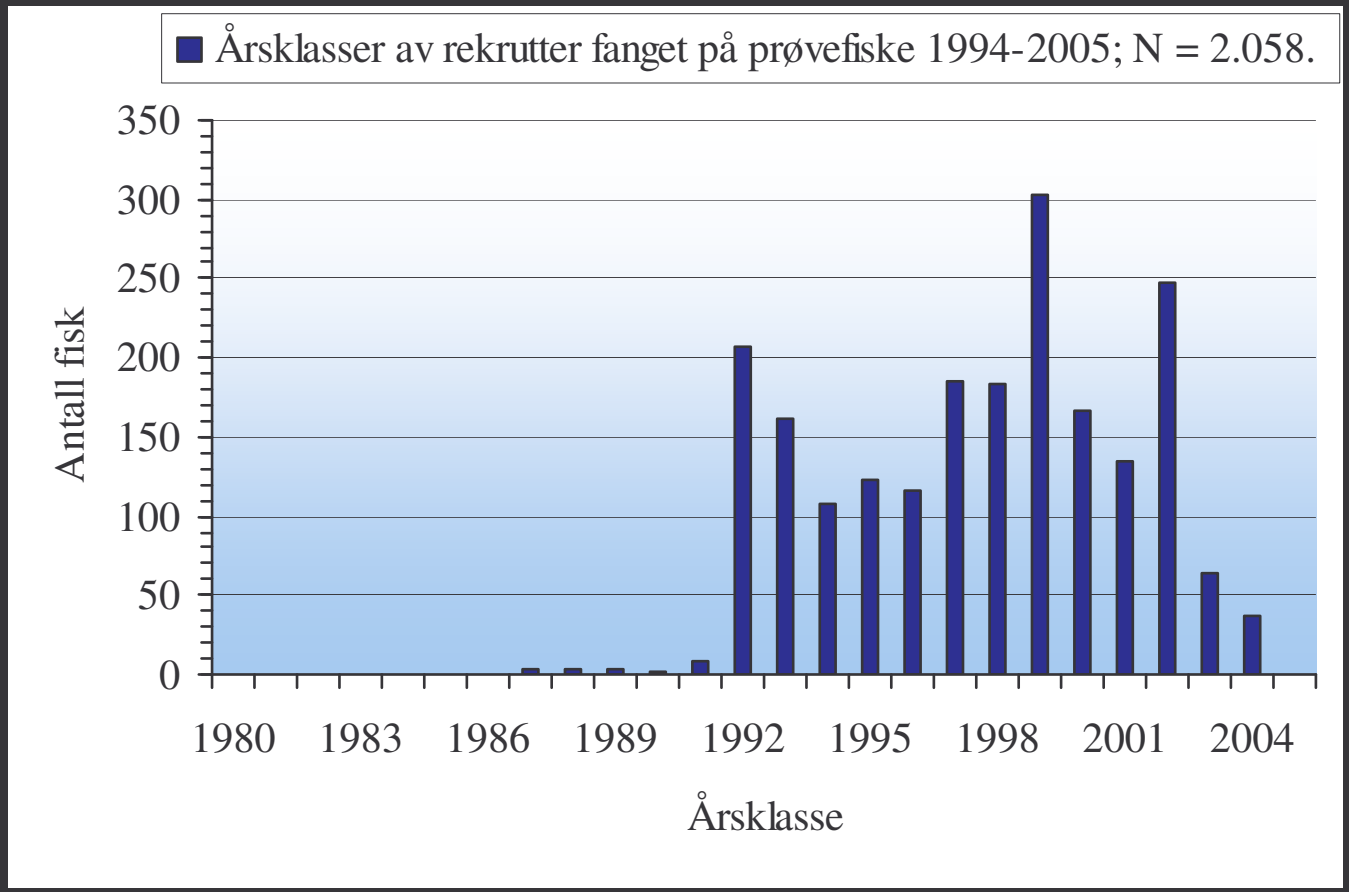

A
Naturlig grus.
Kalkgrus.
Espestøa
N = 192 groper; 5.305 rogn.
Rognoverlevelse (%)
100
80
60
40
20
0
0
1995
1997
1999
2001
2003
2005
2007
Årstall


B
Naturlig grus.
Kalkgrus.
Degernes
N = 282 groper; 7.439 rogn.
Rognoverlevelse (%)
100
80
60
40
20
0
0
0
0
0
1995
1997
1999
2001
2003
2005
2007
Årstall

Store Hovvatn – fra en bestand basert på settefisk til en selvreproduserende bestand

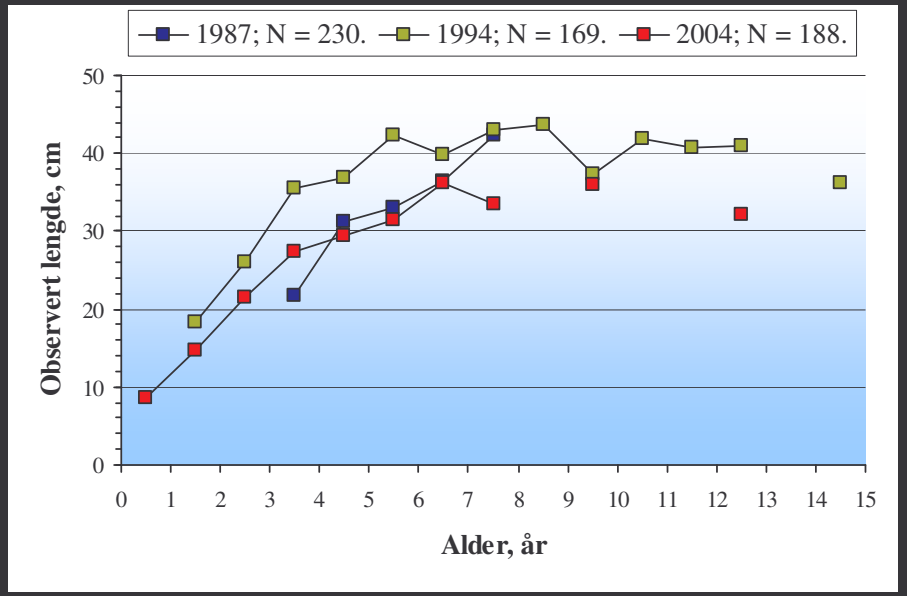


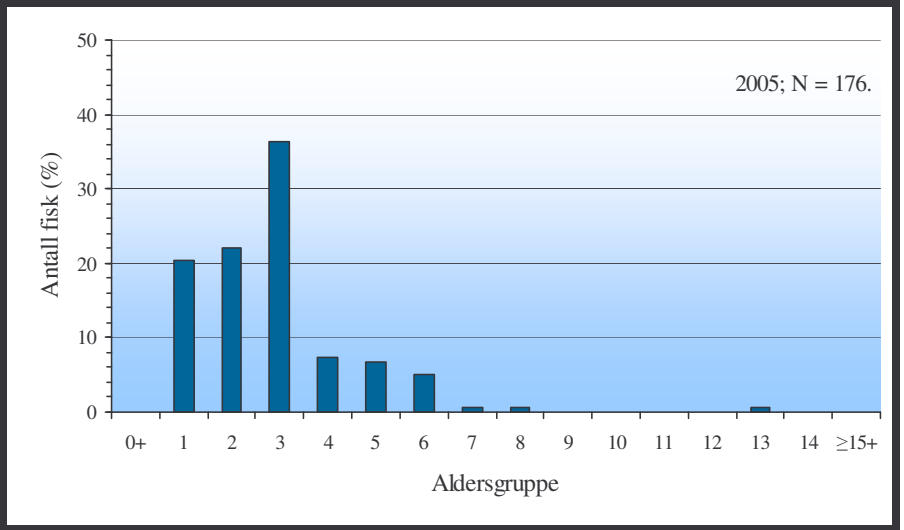
Store Hovvatn



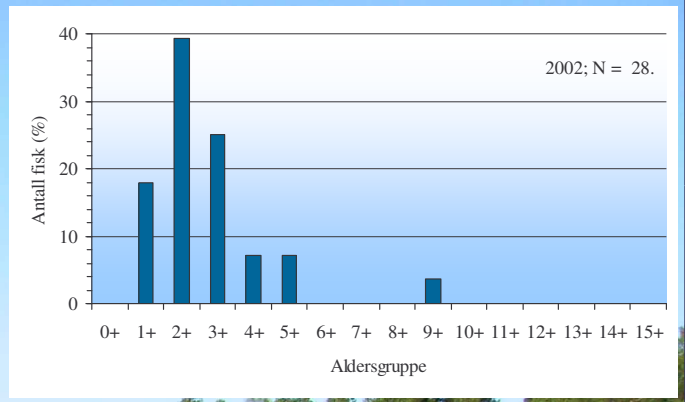
Store Hovvatn







Vegår


2002; N = 28.
Antall fisk (%)
0
10
20
30
40
0+ 1+ 2+ 3+ 4+ 5+ 6+ 7+ 8+ 9+ 10+ 11+ 12+ 13+ 14+ 15+
Aldersgruppe