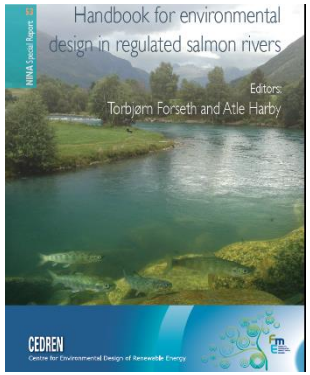
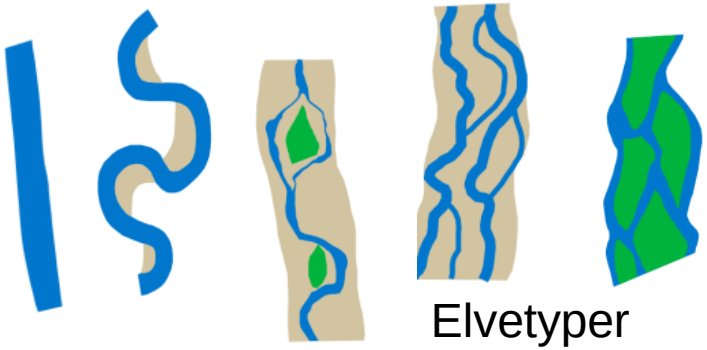
SusWater WP6

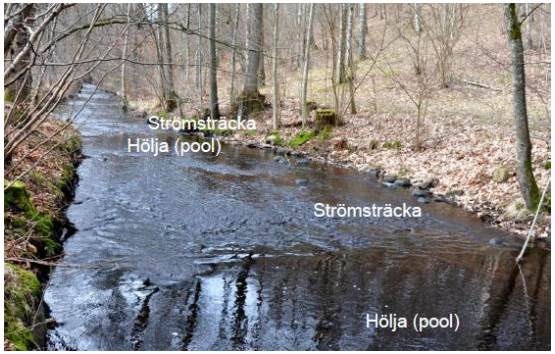
- Samarbeid med HyMo
- Klar link til WP 2, 3 og 4

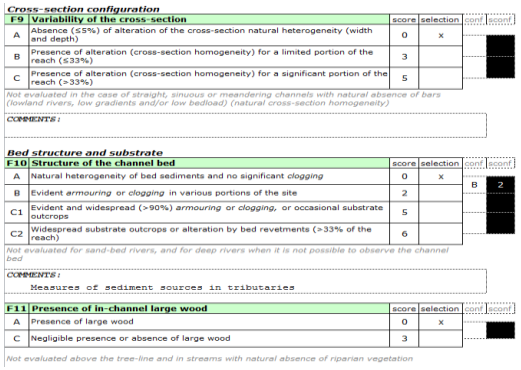


Mesohabitater / strømningstyper



Elvetyper





Cross-section configuration

F9	Variability of the cross-section	score	selection	conf	sconf
A	Absence (≤5%) of alteration of the cross-section natural heterogeneity (width and depth)	0	x		
B	Presence of alteration (cross-section homogeneity) for a limited portion of the reach (≤33%)	3			
C	Presence of alteration (cross-section homogeneity) for a significant portion of the reach (>33%)	5			

Not evaluated in the case of straight, sinuous or meandering channels with natural absence of bars (lowland rivers, low gradients and/or low bedload) (natural cross-section homogeneity)

COMMENTS:

Bed structure and substrate

F10	Structure of the channel bed	score	selection	conf	sconf
A	Natural heterogeneity of bed sediments and no significant *clogging*	0	x		
B	Evident *armouring* or *clogging* in various portions of the site	2		B	2
C1	Evident and widespread (>90%) *armouring* or *clogging*, or occasional substrate outcrops	5			
C2	Widespread substrate outcrops or alteration by bed revetments (>33% of the reach)	6			

Not evaluated for sand-bed rivers, and for deep rivers when it is not possible to observe the channel bed

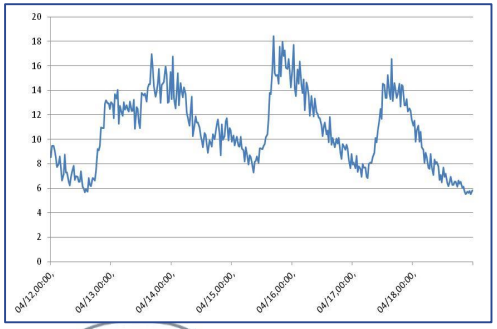
COMMENTS:
Measures of sediment sources in tributaries

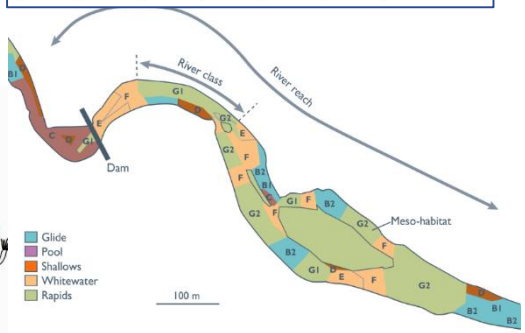
F11	Presence of in-channel large wood	score	selection	conf	sconf
A	Presence of large wood	0	x		
C	Negligible presence or absence of large wood	3			

Not evaluated above the tree-line and in streams with natural absence of riparian vegetation

Hydromorfologi i fokus - HyMo

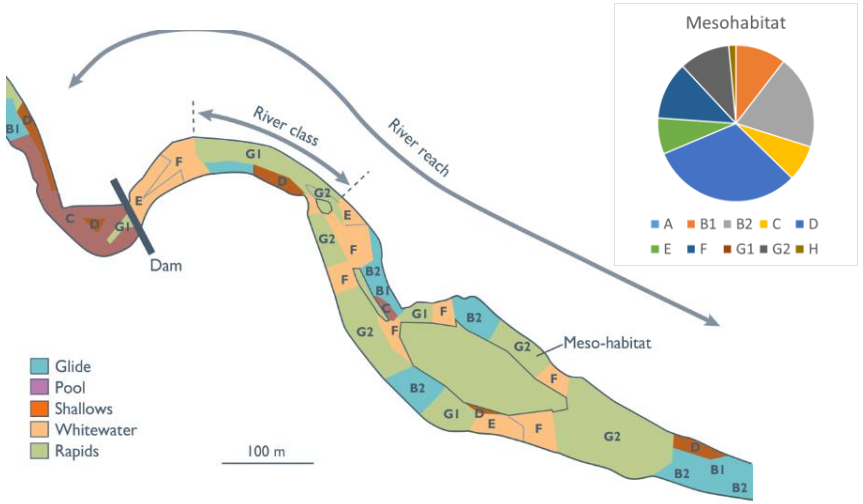
- Testing av ulike metoder for HyMo karakterisering
  - MQI, Naturtyper i Norge, mesohabitat, svensk metode, fjernmåling
  - Oppsummeres i rapport
- Hydrologiske indekser
- "Oversette" CEDREN-resultater til direkte bruk i Vanndirektivet
- "Best practice handbook" om tiltak – koblet til EnviDORR-håndbok
- Workshops, internasjonalt samarbeid, veiledning, analyser, publisering



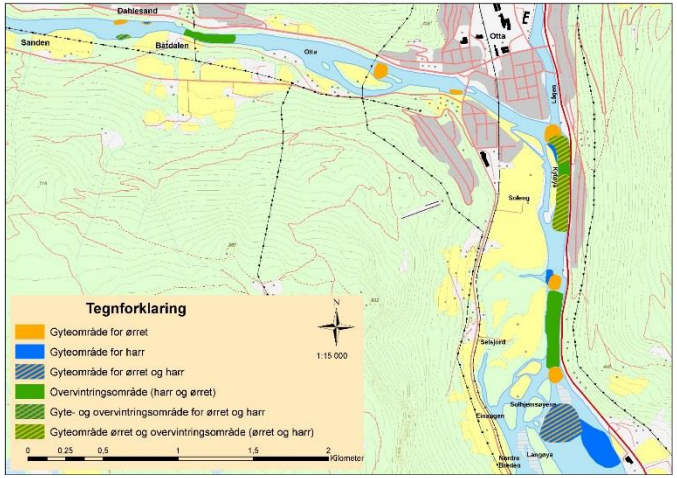


Mapping and characterization

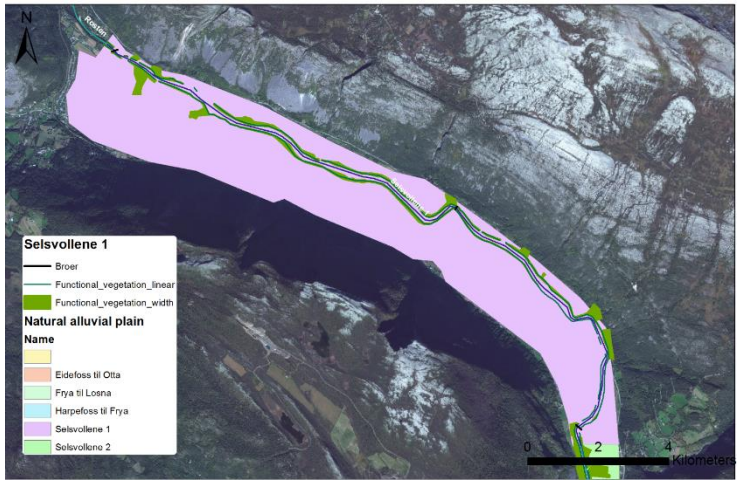
Swedish method for WFD



Mesohabitat and substrate

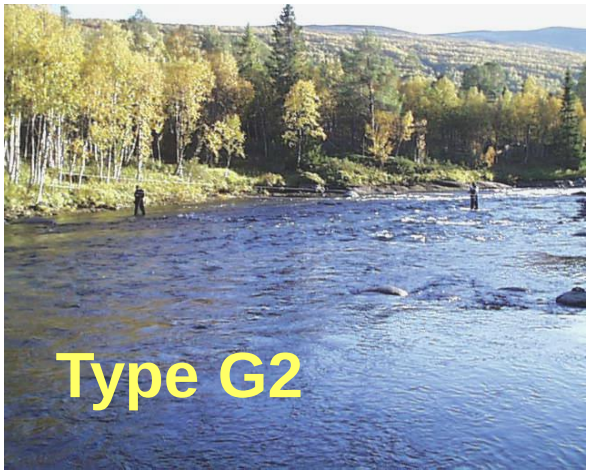


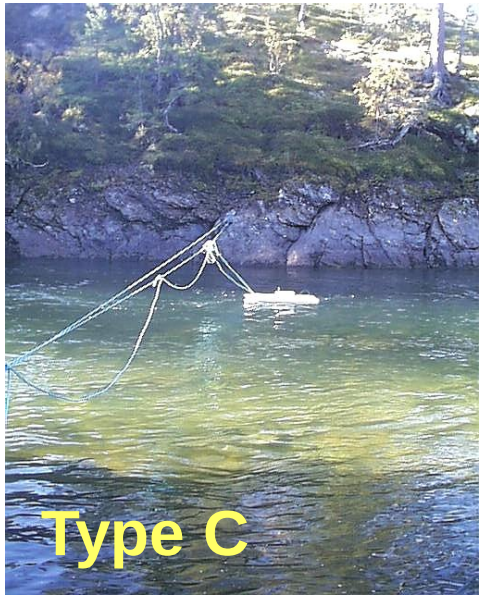
Nature types in Norway

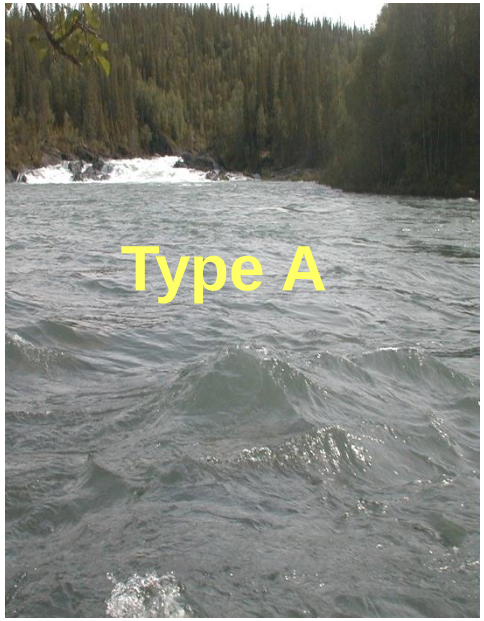


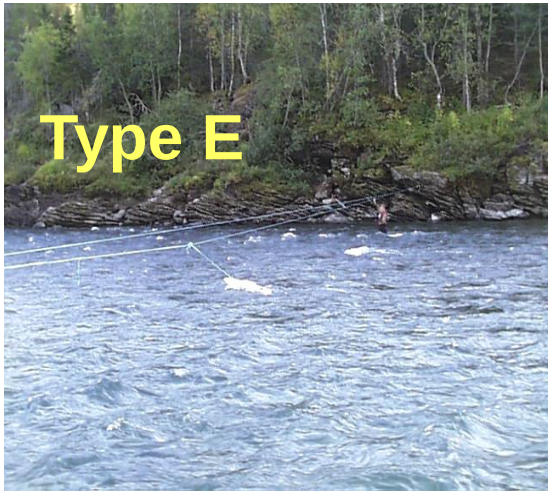
MQI from REFORM project

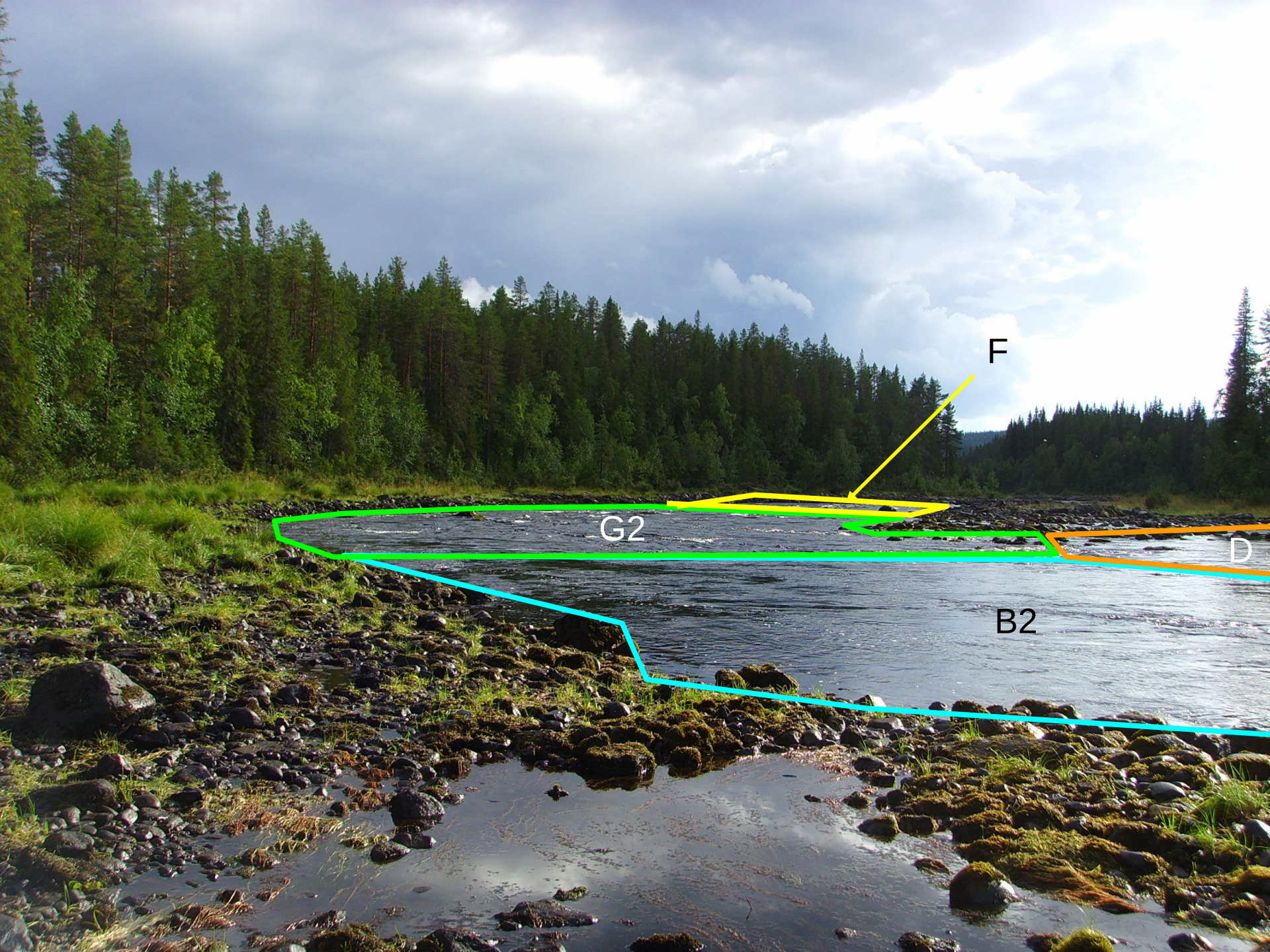
Mesohabitats

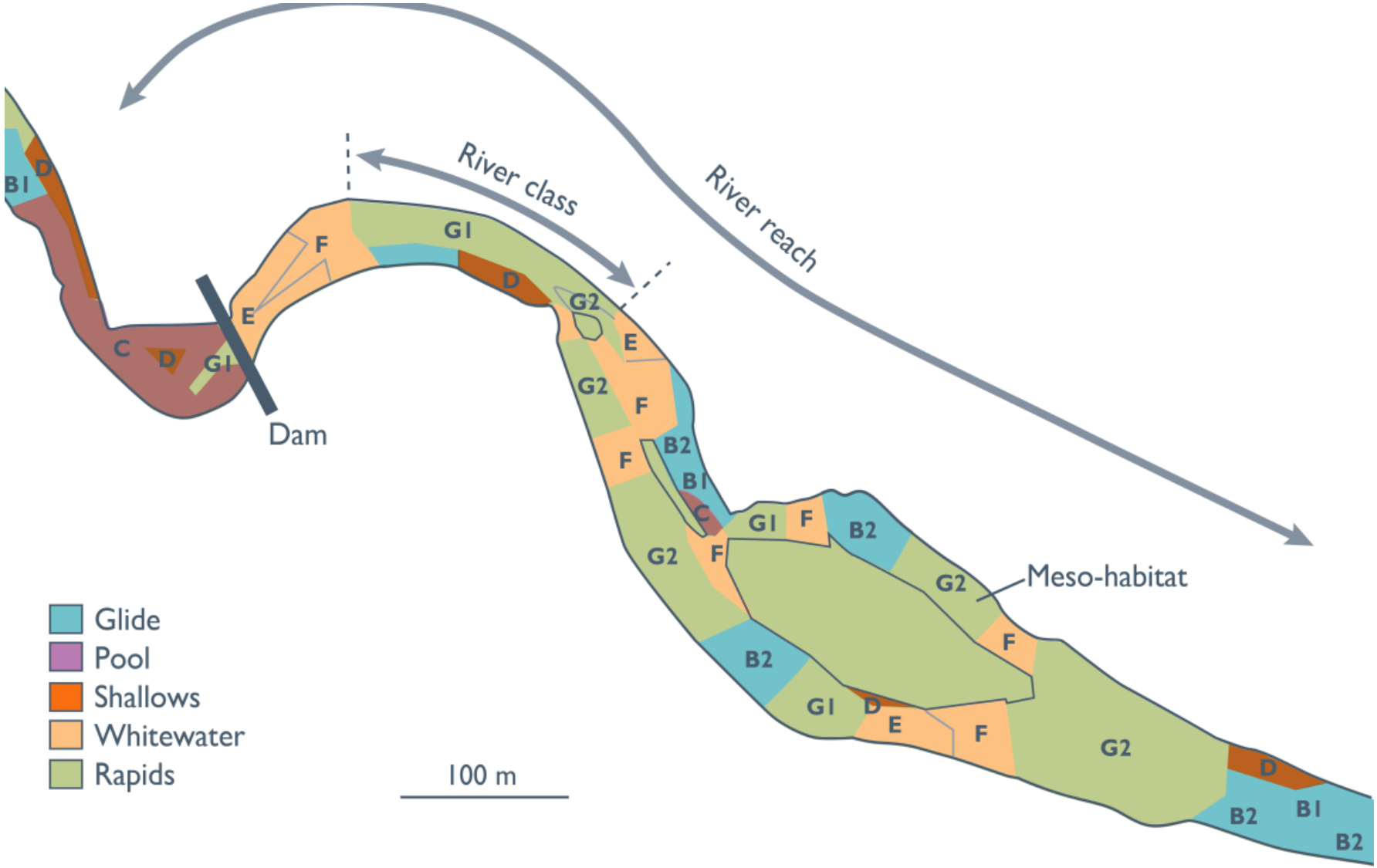








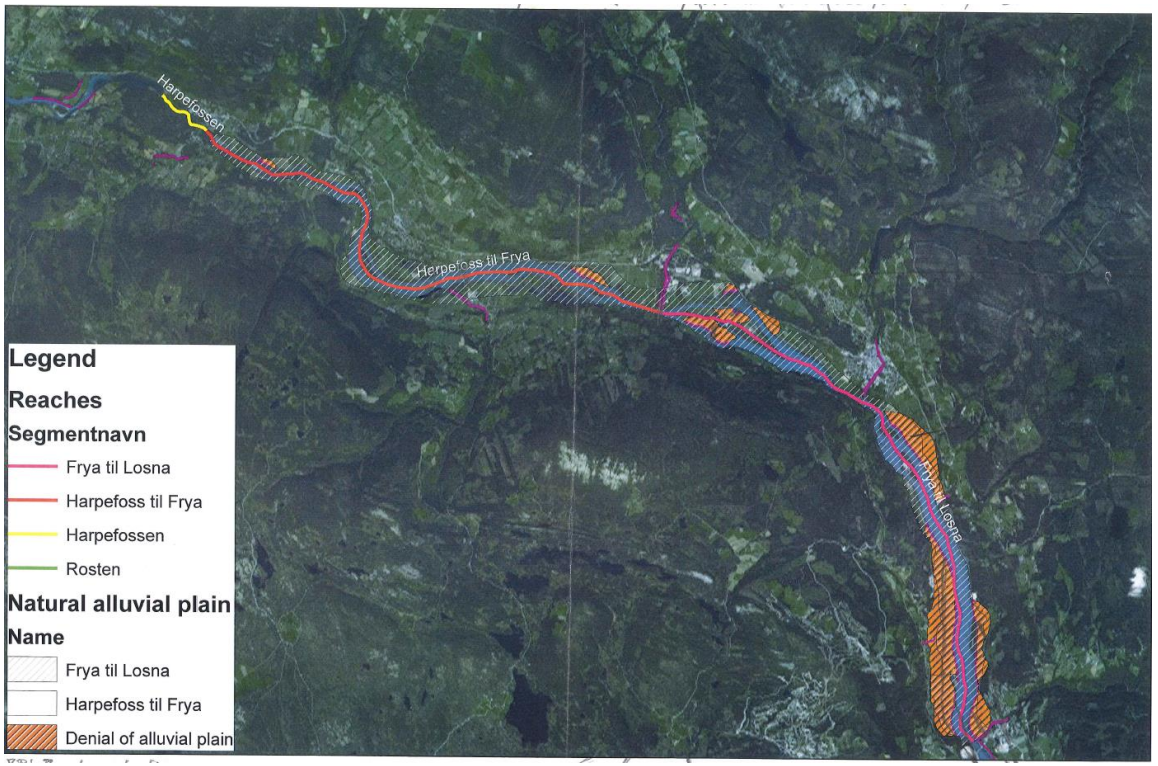

F
G2
D
B2


River reach
River class
Dam
Meso-habitat
Glide
Pool
Shallows
Whitewater
Rapids
100 m
B1
D
C
D
G1
E
F
G1
D
G2
E
G2
F
F
B2
B1
C
G1
F
B2
G2
F
G2
B2
G1
D
E
F
G2
D
B2
B1
B2

Morphological Quality Index (MQI)

Lågen: Harpefoss-Frya og Frya-Losna

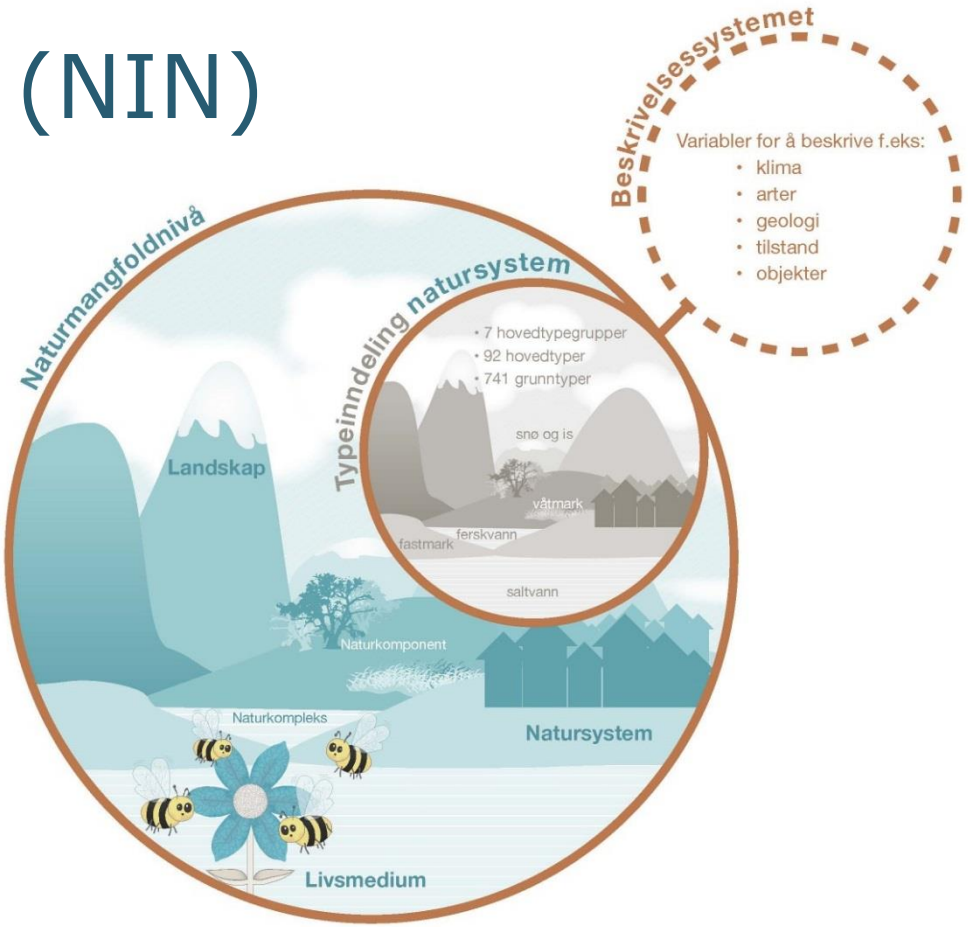
Harpefoss demning, sedimentfelle; diker, forbygning, avstengte flomsletter



MQI = Morphological Quality Index (0≤MQI≤1)			MQI	QUALITY CLASS
MQI	MQI_{min}	MQI_{max}	0.0 ≤ MQI < 0.3	Bad
0,84	0,77	0,86	0.3 ≤ MQI < 0.5	Poor
QUALITY CLASSES (MQI)			0.5 ≤ MQI < 0.7	Moderate
$CLASS_{med}$	$CLASS_{min}$	$CLASS_{max}$	0.7 ≤ MQI < 0.85	Good
Good	**Good**	**High**	0.85 ≤ MQI ≤ 1.0	High

Naturtyper i Norge (NIN)

- Deler inn elv i vannmasser og bunnmasser
- Kan brukes både overordnet og veldig detaljert
- Vannmasser deles i to grupper basert på vannhastighet
- Bunnmasser kan deles i flere grupper basert på substratstørrelse
- Behov for revurdering av grenser og videreutvikling av systemet

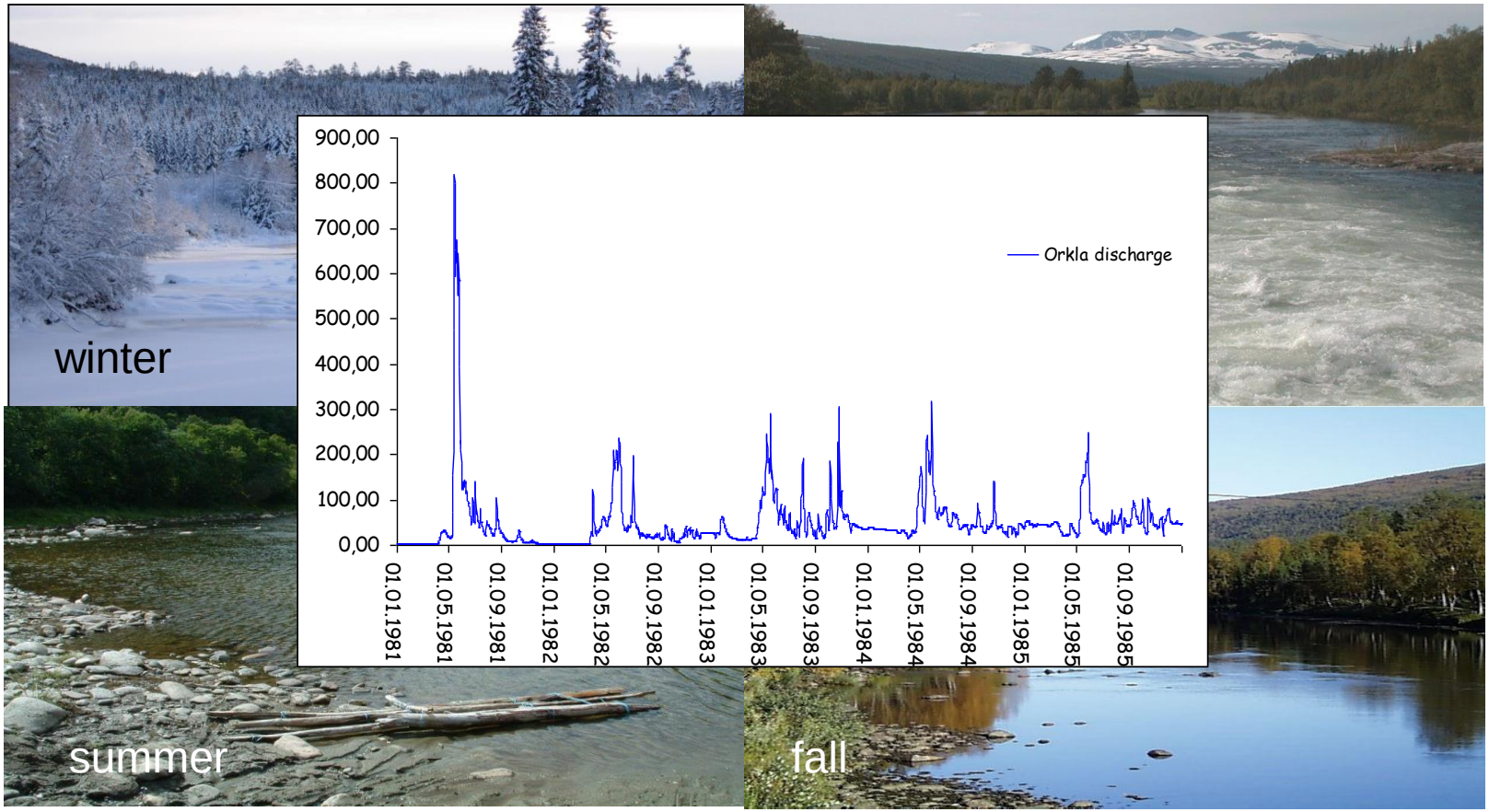


Typeinndeling natursystem:

- 7 grupper
- 92 hovedtyper
- 741 grunntyper

Analyses of hydrologic alteration

The ecosystem is adapted to hydrological conditions prior to regulation or impact – use relevant indices

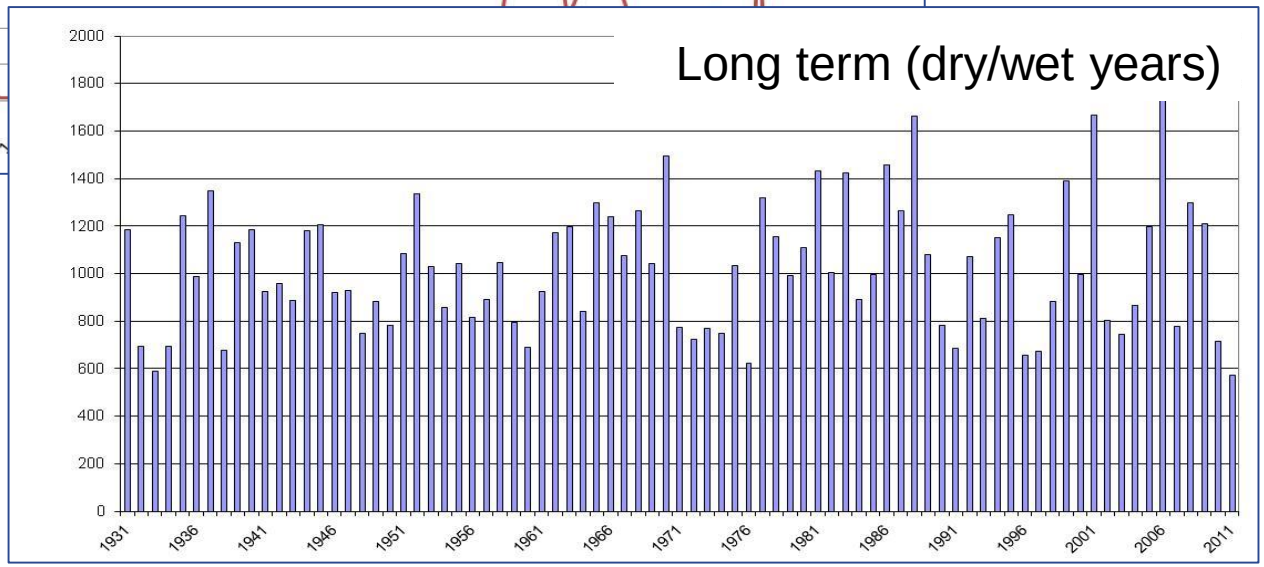


Flow variation in different time scales

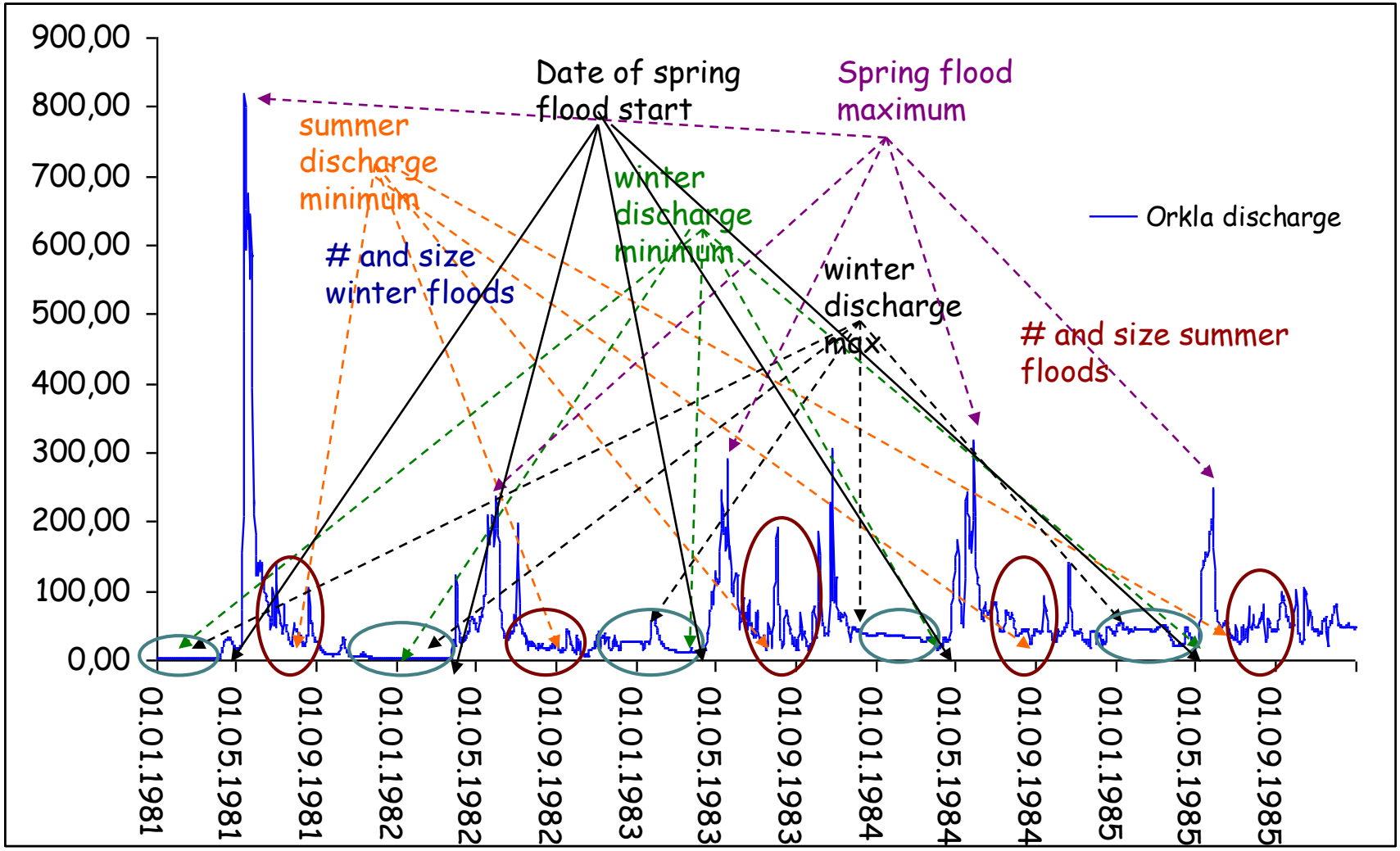
Short term – hours/days

Seasonal (Summer/winter)

Long term (dry/wet years)

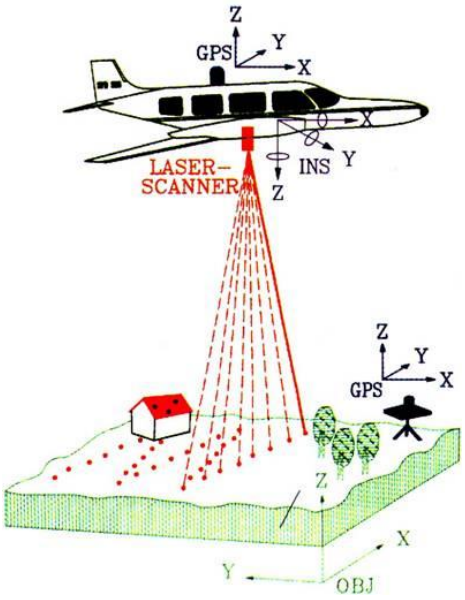


How can we quantify hydrologic variation?



- Can calculate a huge number of hydrological indicators based on the hydrogram

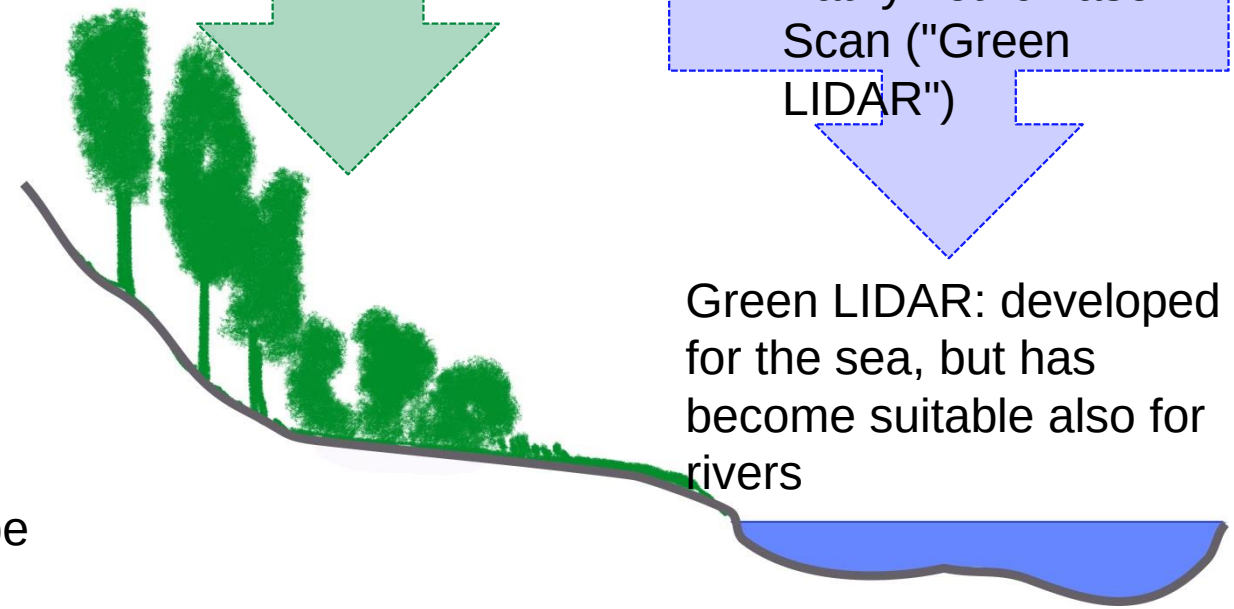
Remote sensing techniques



- Photogrammetry
- Interferometric Synthetic Aperture Radar (IFSAR)
- Airborne Laser Scan

Optical methods: use the a) connection between water depth and light attenuation or b) “structure from motion”

- Optical methods based on aerial photography
- Bathymetric Laser Scan ("Green LIDAR")



Laser measures aircraft-ground distance with high accuracy; Reflections from vegetation etc. have to be filtered out

Green LIDAR: developed for the sea, but has become suitable also for rivers

Leveranser WP6

- Workshops
  - Metodikk – Helsfyr 8-9 september
  - Hydrologiske indekser og fjernmåling 12-13 desember
- Notater for test av metoder
  - Gudbrandsdalslågen
  - Surna
- Foreløpig notat om tilpasning av CEDREN-metodikk fra miljødesign-håndbok og metode for vurdering av effektkjøring - til bruk for vannforskriften og vilkårsrevisjoner
- Best practice håndbok: Tiltak for miljødesign

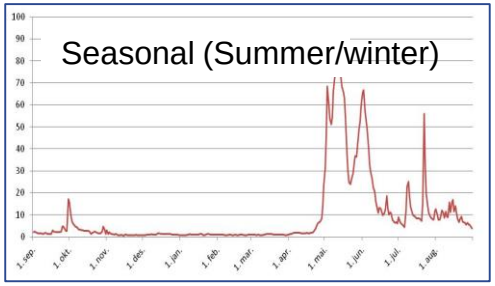


Illustration by M. Friedrich for HarmoniCOP