



Høgskolen i Telemark

EXAM
4502 002 Alpine biodiversity and climatic change
9.12.2015

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Comment/Merknader:	Dictionaries are allowed
Appendix/Vedlegg:	None

Exam results will be available on net via Studentweb



Question 1

- A What are the main factors affecting trout growth in an alpine lake?
- B In what way can climate changes (increased precipitation and temperatures) affect trout populations at Hardangervidda?
- C What are the assumed main consequences of climate change on migrating birds?
- D Which environmental factors that can be associated with rodent cycles in alpine areas?

Question 2

Explain variation in species richness along the following environmental gradients:

- A Air temperature
- B Snow
- C Competition
- D Disturbance

Explain the following terms:

- E Alpha diversity, Beta diversity, Gamma diversity

Question 3

- A Give examples on floristic and ecological changes in the Arctic assumed to be associated with recent climate changes.
- B Give examples on floristic and vegetation changes in Scandinavian alpine areas assumed to be associated with recent climate changes.

Question 4

- A Describe different climate factors that have changes during the last decades which are also assumed to continue also in the future.
- B Describe the main patterns in temperature variations since the late glaciation (the last 13.000 years) until present.



Question 5

The diagram below shows result of a PCA analysis of vegetation data sampled along elevation gradients (1000-1550 m a s.l.) in a north and a south facing slope in SE Norway (red dots are plots in the south facing slope and open squares are plots in the north facing slope). Weighted average plant indicator values were estimated for all plots. Also number of vascular plant species in the plots (NoVas) and plot elevation (Altitude) were estimated, and these variables were used in the PCA analysis.

ET = Ellenberg temperature indicator, EN = Ellenberg nitrogen indicator, EFF = Ellenberg soil moisture indicator, EL = Ellenberg light indicator, ER = Ellenberg reaction indicator, SI = Snow indicator.

Describe which conclusions you can draw from this PCA plot.

