



EURONoise 2006
30 May - 1 June 2006 Tampere, Finland

HIGH NATURALNESS ALPINE AREAS ACOUSTICAL CHARACTERIZATION IN AOSTA VALLEY

**Giovanni Agnesod, Christian Tibone, Christian Tartin,
Daniele Crea and Filippo Berlier**

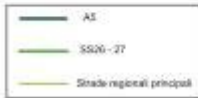
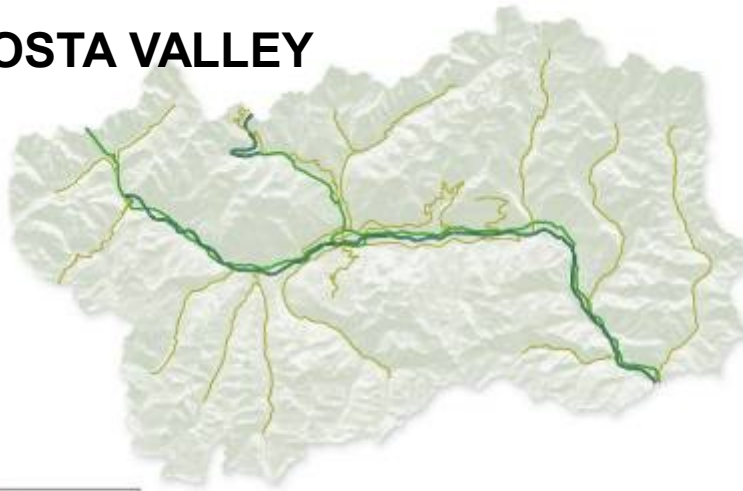


**Agenzia Regionale per la Protezione dell'Ambiente (ARPA)
della Valle d'Aosta**

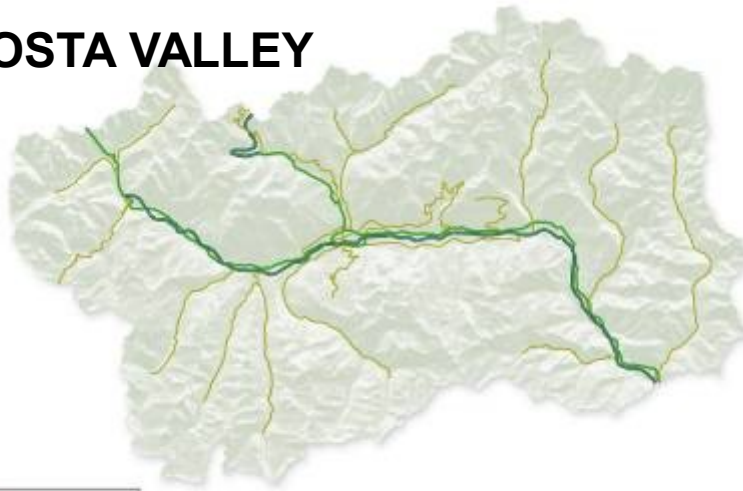
www.arpa.vda.it

arpa@arpa.vda.it

AOSTA VALLEY



AOSTA VALLEY



Average altitude: 2106 m a.s.l.



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The territorial structure causes situations of close proximity of the noise sources to the receptors

... but this is not the subject of this paper

The EU directive 2002/49/CE pointed out the safeguard of the natural acoustic climate to the general attention.

This topic specially regards alpine regions, such as Aosta Valley, characterized by high values of environmental naturalness.

We are led to extend the attention from built and highly infrastructured areas to remote ones, where the notion of sensible receptor extends to include the whole territory.



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There is a great variability of both natural and artificial noise levels in the natural environment, due to the variety of the sources and to the time variability of the noise emissions, which is frequently seasonal

Informations about noise levels in quiet mountain areas is important to define suitable indicators and reasonable evaluation criteria for regulatory purposes, at regional and national level.



A very simple indicator is the differential level R between environmental noise (taking into account natural and artificial sources), and the natural environmental soundscape.

- $R = L_{eq} \text{ env.noise} - L_{eq} \text{ soundscape}$



**Alpine ski resort
(Cervinia, Plan
Maison, 2500m)**

Wind

**30.5
dBA**

**Chair-lifts, snowpark,
many tourists**

**61.4
dBA**

**R=30.9
dBA**





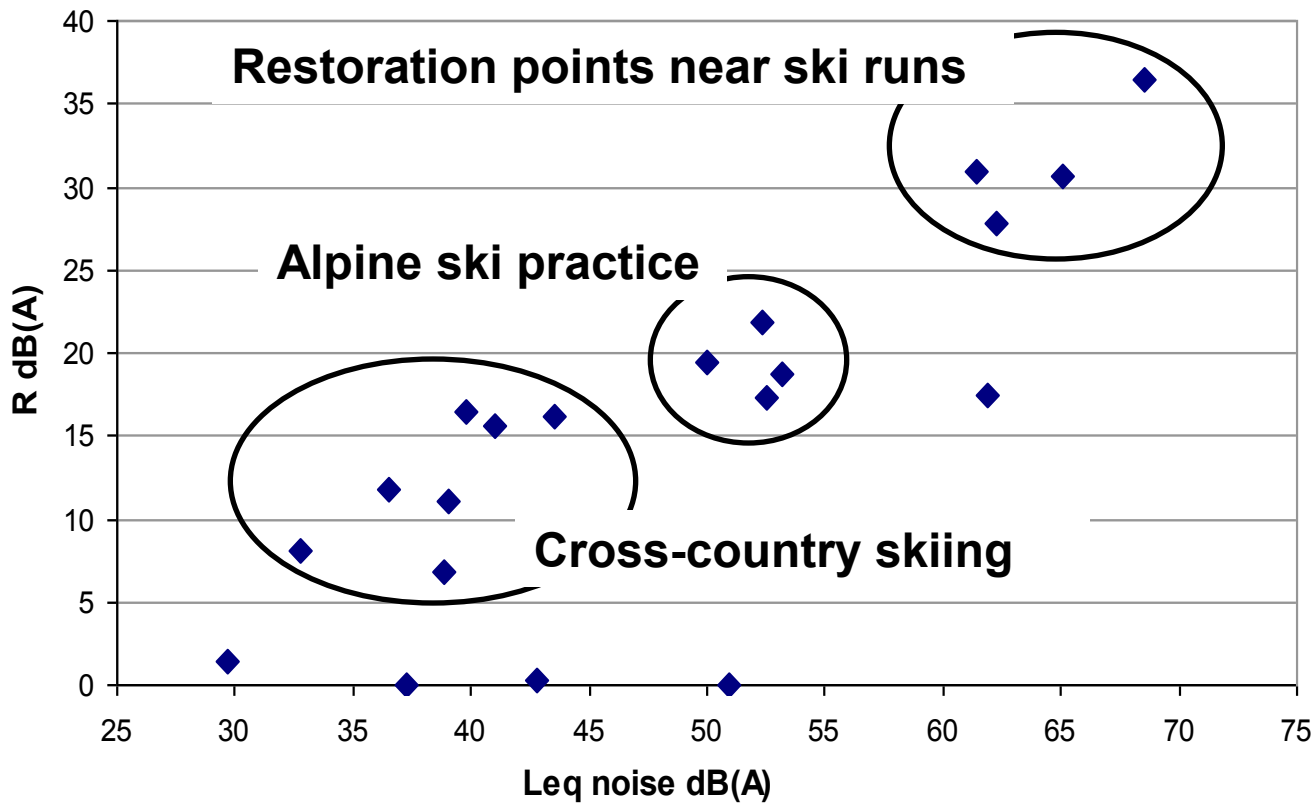
<p>Top of mountain (Greuvon, 2660m)</p>	<p>opposite side to ski resort</p>	<p>24.7 dBA</p>	<p>Toward ski resort</p>	<p>36.5 dBA</p>	<p>R=11.8 dBA</p>
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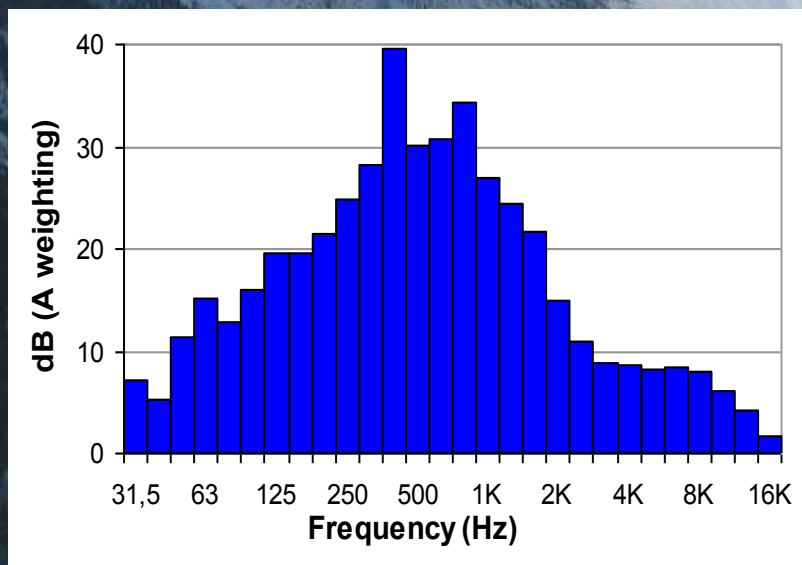
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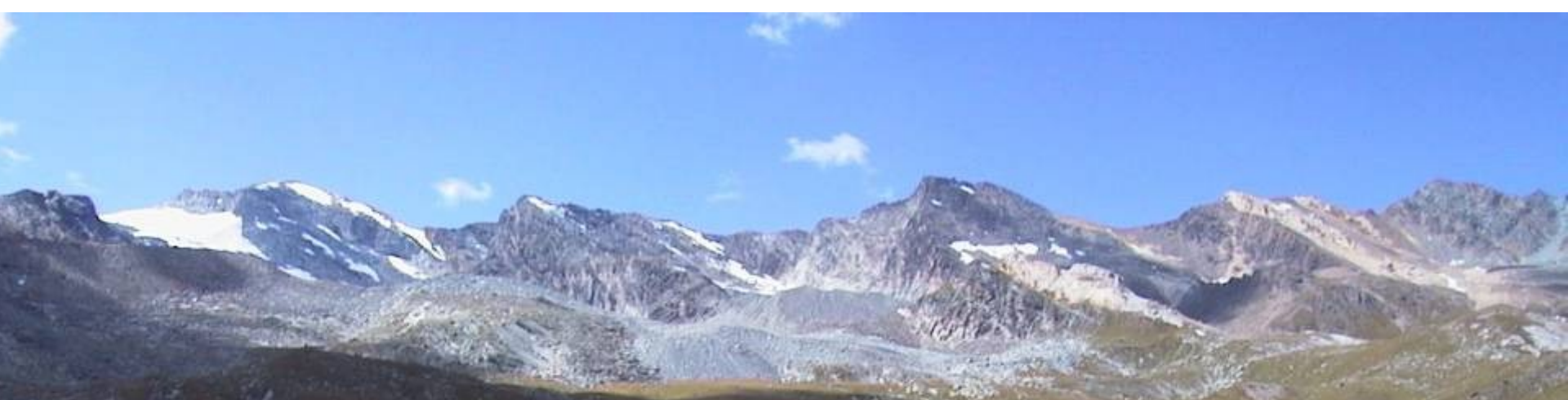
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Mountain refuge (V.Sella – Gran Paradis National Park, 2590m)	Marmots stream	27.0 dBA	Tourists voices many persons	46.6 dBA	R=19.6 dBA
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Top of mountain (Becca di Nona , 3150m)	Opposite side to valley	21.3 dBA	Noise from valley	36.1 dBA	R=14.8 dBA
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According to the Italian law, the most restrictive diurnal environmental noise limit is 50 dBA.

The variety of acoustical situations found in mountain environment shows that non-negligible acoustic impact and disruption of natural soundscape can occur at levels below this threshold.



The cases presented in this paper show that a simple indicator based on the differential level between environmental noise and the natural environmental soundscape, eventually on single 1/3 octave frequency band, allows a more efficacious protection of the natural soundscape.

