Summer Ski Resorts have to close
Sand pistes instead of snow: Because also the glaciers are sweating, things are over and done

Summer Ski Areas in the Alps:
First Victims of Climate Change?
Stilfserjoch/
Passo Stelvio,
August 24, 2008
Marius Mayer
Julius-Maximilians-Universität Würzburg, Germany

Agenda
1. Introduction
2. Summer vs. Glacier Ski Tourism
3. Diffusion of Summer and Glacier Ski Tourism
4. Climatological and Tourism Influences Affecting Summer and Glacier Ski Tourism
5. Adaptation Strategies and Measures
6. Discussion and Conclusion

Source: Münchner Merkur, August 16th/17th 2003

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Research Questions

1. Is the continual downturn of summer skiing directly related to the impacts of climate change? This presentation aims at partly contesting this hypothesis by highlighting the role of demand trends and other influences.

2. Which kind of adaptation strategies are implied by the ski area operators and which perspectives do glacier ski resorts face?

Summer vs. Glacier Ski Tourism

- No clear definition of “summer skiing” or “glacier skiing” commonly used
- **Broad definition**: “summer ski resorts” = in operation between May and November (BARNICK 1970, 1974)
- **Narrow definition**: skiing operations between a) June 21 and September 21 (calendrical summer) and/or b) June 1 and September 1 (meteorological summer)
- In most glacier ski resorts the lifts and ski runs are not situated on glaciers to 100%
- Increasing share of glacier ski resorts does not offer summer skiing any more or never has
Diffusion of Summer/Glacier Ski Resorts in the Alps

Number of Resorts

- Glacier Ski Resorts
- Summer Ski Resorts
- Data Uncertainties

Source: own research

Glacier Skiing in the Alps 2011

Number of operating glacier ski resorts in 2011

Source: MAYER 2012

(Former) Summer/Glacier Ski Resorts in the Alps in 2011

Share of Operating Days in 2011

- Ski Area Operating in Summer Only
- Ski Area Operating in Meteorological and/or Calendarical Summer
- Former Summer/Glacier Ski Area Operating now Neither in Meteorological nor Calendarical Summer
- Closed Down Ski Area

Source: Own research, Li-Pure World info
Data: M. Mayer, Cartography: W. Weber
Institute of Geography and Geology, JMU/Würzburg, 2012
Accumulation Area
Accumulation > Ablation
= Mass Gain

Equilibrium Line (~snowline in late summer):
Accumulation = Ablation
= Mass Balance

Ablation Area
Ablation > Accumulation
= Mass Loss

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**Glaciological Basis of Summer Skiing**

- Above the equilibrium line, skiing is (theoretically) possible all year
- Sensitivity in terms of rising snowlines due to global warming

Source: WINKLER 2009: 39

Theodulgletscher, Zermatt, CH, 1968

Theodulgletscher, Zermatt, CH, July 1981

Theodulgletscher, Zermatt, CH, September 2009
Tourism Trends Affecting Summer/Glacier Skiing

- Positive image of summer skiing as a trendy outdoor activity ended in the 1980s
- Summer skiing is and has always been an expensive activity
  ⇒ Bad price-performance-relationship
- Loss of the snow-reliability USP of summer/glacier ski resorts in the aftermath of the area-wide diffusion of snowmaking
- Demand for summer ski training possibilities shifted to South America or New Zealand
- Low frequentation of most summer ski resorts in combination with high costs for preparation and lift adjustments lead to unprofitability

Low Profitability of Summer Skiing: Mölltal, Austria

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<td>Summer ski operation only; no access in winter (1991: no data)</td>
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Source: own research based on Österreichische Eisenbahnstatistik 1987ff.

Col Sommeiller
Ruins of former summer ski lifts
Colle Gigante
Alagna

Colle Gigante

© Sommerschi.com 2008
© G. Loibl 2007

Summer Ski Resort Stilfser Joch/Passo Stelvio (IT) 2012 6 Ski-Lifts

Source: own research
Glacier Ski Resort Stubaier Gletscher (AT) 2012
- 20 Ski-Lifts
- Cap.: 12.17 Mio. VTMH

Glaciers 1970
Glaciers 2010
Artificial Snow-Making

Technical Adaptation Measures:
Snow Farming

Diavolezza, CH, 29th September 2009

Technical Adaptation Measures:
Snow Farming

Diavolezza, CH, 29th September 2009

December 22nd, 2004

(A Depot) Snowmaking on Mölltaler Gletscher, Austria

Source: www.smucisca.net

Source: www.alpinforum.com

Source: Mayer et al. 2007

Source: www.smucisca.net

Source: own research
Snow Making Influences the Mass Balance of Glaciers

Slightly positive mass balance on the ski slope

Source: own draft based on SCHÖNER et al. 2006: 23

Summer Ski in its heydays...

Hintertuxer Gletscher, early September 1979

© DiDa

30 Years Later: Glacier Almost Gone, no Skiing possible... Start of Adaptation Measures

Hintertuxer Gletscher, August 3rd, 2008

© M. Schuster 2008

Results of Adaptation Measures: Summer Skiing still possible!

Hintertuxer Gletscher, August 21st, 2010

Installation of Snow-Making Facilities and Massive Depot Snow-Making

Large-Scale Use of Geotextiles to Decrease Ablation

© M. Schuster 2010

IGU Pre-Conference Symposium Tourism, Trier 2012, Marius Mayer
Results of Adaptation Measures:
Summer Skiing still possible!

Hintertuxer Gletscher,
August 20th, 2011

Artificial névé (deposit snow making and snow accumulation with snowcats) is outliving summer, ensuring ski operation in autumn, and also summer!

Conclusion

- Glacier recession and worsening snow conditions are major factors in the reduction of summer skiing
- Potential to raise awareness and/or convince sceptics?
- Adaption is partly possible, but climate change cannot be stopped
- Continuation of summer skiing only side-effect of adaptation
- Demand trends: negative image, price, marketing value, USP lost
  - reduced/unattractive summer ski offer => limited marketing efforts
    - demand decrease => economic losses = vicious circle
- Major challenge: demand-supply disparity
- Despite positive outlook for glacier ski resorts in winter, losses of attractiveness due to landscape change are inevitable

...in October 2011

Thank you for your attention!
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References


The Future? Temperature Independent
Snow Making

“All weather Snowmaker“ at Pitztaler Gletscher, AT

October 2010

Source: www.alpinforum.com
The Future? Temperature Independent Snow Making

"All weather Snowmaker" at Pitztaler Gletscher, AT October 10th, 2010: 2730-2850 m, Exposition: SE

Source: www.alpinforum.com

Dank Beschneiung ist auch am 16. Juli 2006 noch Sommerskilauf möglich – Mölltaler Gletscher...

Im Kontrast dazu: Saas-Fee, CH, am 7. Juli 2007… (Höhenlage >3200 m)

Mölltaler Gletscher/Wurtenkees
Beschneiung von Gletscherflächen in Österreich

© ManG@A1.net 2004

Mölltaler Gletscher/Wurtenkees
Rest-Gletscher Wurtenkees

Mölltaler Gletscher/Wurtenkees
Zapfstelle für mobile Schneerzeuger mitten auf dem Schaufenster

© M. Mayer 2004

Stubai Gletscher
Schneelanze

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