CLIMATE SERVICES SUPPORTING TOURISM DEVELOPMENT - FREQUENTLY ASKED QUESTIONS

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1. How does climate impact tourism?

Many types of tourism are weather dependent and by extension climate dependent. It is therefore very likely that climate change will affect your business area sooner or later. Climate change can reduce snow cover, increase and prolong heat waves or change the patterns of annual rainfall for example. Climate change is a relatively slow process, so perhaps in your region the changes are not so obvious in the short run; yet, in that case the effects may be strong in neighbouring or competing areas and thereby still influence your business area.

The effects of climate change on your business area can be manifold, and be both negative and positive. *If you are unprepared your organisation may suffer from the negative effects, while being unable to benefit from possible positive effects*. Next to climate change also *climate variability* (e.g. variably cold and tepid winters) is important for many types of tourism, while climate change can make the variability more extreme.

For many countries and regions in Europe studies have already been conducted, e.g. regarding heat waves, reduction of snow cover, extreme rainfall, drought, etc. You can inquire with your municipality, region, or sector organisation what kind of information is already available.

Some sources for additional information:

"Climate change impacts in Europe" by European Environmental Agency [//link to be added: https://www.eea.europa.eu/media/audiovisuals/climate-change-impacts-in-europe/view]

"Climate Change: Implications for Tourism" by the Cambridge Institute for Sustainability Leadership (CISL) and the Cambridge Judge Business School (CJBS) [//link to be added: https://www.cisl.cam.ac.uk/business-action/low-carbon-transformation/ipcc-climate-science-business-briefings/pdfs/briefings/IPCC_AR5__Implications_for_Tourism__Briefing__WEB_EN.pdf]

"How will climate change affect tourism flows in Europe - Adaptation options for beach and ski tourists assessed by ToPDAd models" by the European ToPDad project [//link to be added: http://www.topdad.eu/news/brief-of-topdads-results)

Scientific publications:

Damm, A., Greuell, W., Landgren, O. and Prettenthaler, F. (2016). Impacts of +2 °C global warming on winter tourism demand in Europe. Climate Services 7:31–46. URL: http://www.sciencedirect.com/science/article/pii/S2405880715300297.

Grillakis, M.G., Koutroulis, A.G., Seiradakis, K.D. and Tsanis, I.K. (2016). Implications of 2 °C global warming in European summer tourism. Climate Services 1:30–38.

Rutty, M. and Scott, D. (2010): Will the Mediterranean Become "Too Hot" for Tourism? A Reassessment, Tourism and Hospitality Planning & Development, 7:3, 267-281 http://dx.doi.org/10.1080/1479053X.2010.502386

Steiger, R. (2010). The impact of climate change on ski season length and snowmaking requirements in Tyrol, Austria. Climate Research 43:251–262.

Tervo-Kankare, K. (2011): The Consideration of Climate Change at the Tourism Destination Level in Finland: Coordinated Collaboration or Talk about Weather?, Tourism Planning & Development, 8:4, 399-414 http://dx.doi.org/10.1080/21568316.2011.598180

Toeglhofer, C., Eigner, F. and Prettenthaler, F. (2011). Impacts of snow conditions on tourism demand in Austrian ski areas. Climate Research 46:1–14.

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2. What are climate services?

Weather services are familiar to all of us, climate services perhaps less so. Climate represents average weather conditions over a period of a month to a year for a certain region, based on long term (multi-decadal) observations. Climate statistics can be either observed or modeled. The statistical nature and the long future time scale, ranging from few months to decades, limits the attainable average accuracy of predictions. It also implies that there are limits to meaningful levels of spatially and temporal detail of climate predictions. A lot of useful information about the likelihoods and nature of different climatic conditions as well as about their technical, economic and societal impacts can, however, be produced.

Climate services are customized information products that utilize climate data. They can be for example projections, forecasts, information, trends, economic analysis, assessments, counselling on best practices, development and evaluation of solutions and any other service in relation to climate that may be of use for the society at large. Often these services are used to support climate change adaptation, mitigation and disaster risk management (DRM).

Climate services can come in many forms. They can be for example data oriented – such as tables and maps – or advisory – such as consultancy projects. Climate services can also be presented as education. Climate services can be delivered as a single event, like a project or a one-time acquisition, as well as take the form of recurrent flow of information, e.g. by integration of climate data flow to an external database with quarterly or annual updates.

3. Benefits of climate services?

Climate services can support in anticipating and adapting to both climate change and short-term climate variability. They can also be further refined and used to generate valuable services to other users groups, such as the tourists themselves.

The tourism sector is highly weather and climate sensitive. Managing climate risks successfully provides an opportunity for businesses in the sector. Climate services can help in guiding investments and planning operations. A ski resort operator may assess whether and where to invest in new ski lifts or prepare for a growing role of year-round tourism. Climate services in the form of seasonal forecasts can support in the planning of artificial snow making or snow storages. Successful use of climate services for these purposes is already happening around the world.

Customized climate services are tailored to specific needs and destinations. Compared to generic study results, a higher spatial and temporal resolution of climate data can be used. In addition, business and region specific information can be taken into account in the modelling and analysis. For ski resorts, for instance, individual snowmaking capacities and snowmaking strategies can be implemented in tailored snow simulations as well as individual options for action can be assessed (e.g. expansion of snowmaking capacities, dimensioning of water reservoirs, shut down parts of a ski resort, etc.). Thus, the information is more accurate for the specific context than generic climate change impact studies.

4. Available services?

Climate services come in many forms, depending on how tailored and data intensive they are, and whether they are designed for specific use or more as a platform for further refining.

Climate information in its most generic form – climate related statistics, predictions, maps, tables etc. – are often produced by public research institutions and national weather services. In the more refined forms of climate services – consulting, tailored information products – private companies tend to have a larger role. There are also some organisations serving as brokers between suppliers and users of climate services.

	Generic	Customised
Focused	Maps & Apps: ·Generic climate services ·Freely or cheaply available to all users	Expert Analysis: ·Scientific, professional, commercial, monodisciplinary climate services ·Tailored to specific decisions and decision-makers
Integrated	Sharing Practices: ·Mutual services on adapting and mitigating climate change in specific environments ·Available to all users	Climate-inclusive Consulting: ·Professional, commercial and trans-disciplinary climate services ·Tailored to specific decisions and decision-makers

Some examples of available online climate services:

Climate change impacts on summer and winter tourism in Europe: https://www.atlas.impact2c.eu/en/

Climate change Impacts, Adaptation and Vulnerability – Cross-country skiing in Finland: http://www.iav-mapping.net/U-C-IAV/skiing/

CLIMAMAP Climate Indices, e.g. for Styria: https://data.ccca.ac.at/en/dataset/climamap-climate-indizes-karten-steiermark-v01

The Finnish Climate Guide: http://climateguide.fi

OASIS hub - The Global Window to Free and Commercial Environmental and Risk Data, Tools and Services https://oasishub.co/

5. Successful examples?

The use of climate services is still developing in the tourism sector. Few businesses or officials are aware of their potential and of the already available scope of service offering. There are, however, several success stories and good practices, as these examples from Austria show:

Assessment of the future snow-reliability of four ski areas in Lower Austria

A ski season simulation model that accounted for the individual snowmaking capacities was applied to assess the future snow-reliability of four ski resorts in Lower Austria. The model was calibrated using local measurement data, considering elevation and aspect of the ski resorts. Results of the calibrated model were validated using reported season lengths and reported water consumption for snowmaking. Regional climate model data was used to assess the development until the mid of the century. Provided indicators included the change in average season length, the change in the probability of ski operation during Christmas holidays, and the required amount of technical snow to maintain a 100-day season. In addition, snowmaking options under current climatic conditions were analysed, including the variability in season length given increased snowmaking capacities.

Based on the information gained from the CS, the governmental body (co-)owning the four ski areas decided to close parts of one of its ski resorts, dismantle the transport facilities and transfer the snowmaking infrastructure to higher-lying parts of the respective resort. In addition, further investments into the snowmaking infrastructure of the ski resort's higher-lying parts were undertaken in the form of an additional reservoir.

Assessment of investment options for a Styrian ski area in the light of climate change

This example of climate service use included the assessment of the ski area's importance for the regional economy, the assessment of the ski area's risks towards climate change, the analysis of opportunities and challenges associated with the establishment of a bike park, and an economic feasibility study of the different investment options. Climate change risks were analysed by means of a ski season simulation model, accounting for the ski area's specific snowmaking capacities and extension plans. Regional climate model data was used to assess the development of the next decades. Using data on current skier days and sales, changes in ski season length were translated into monetary terms and incorporated into the economic feasibility study of the investment options.

Based on the outcomes, the ski resort owners decided to invest in the optimization of the existing snowmaking infrastructure. In addition, with the report's short-version attached, the public subsidies applied for at the provincial government were granted (previous requests had been rejected).

For more details, visit: http://marco-h2020.eu/portfolio_item/tourism/

6. How much do climate services cost?

The costs of climate services are dependent on the type of service. A lot of generic climate data is freely available, and these might cover significant parts of your organisation's climate information needs, though their utilization might require a fair level of expertise.

Spatially precise or tailored information that requires modelling or refining of generic data typically comes with a price. In many countries longer term climate projections are however public information. Still, detailed localized projections or analysis of particular phenomena will often need to be made upon request.

Consulting, training and other forms of service requiring more intensive interaction between the provider and the client are naturally most often charged for. In some cases charges may be lower or initially absent, e.g. when applying co-design in case of new climate services in a pilot phase.

As tourism businesses or organizations operating within the same region share largely the same climate and climate risks, an attractive option is to procure climate services in co-operation and thus sharing the costs.

Even if product tailoring and user-friendliness have been taken care of, the meaningful use of climate services will – at least initially – require some extra efforts. In that sense there will always be some cost, even if the service is provided free of charge.

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7. Where can I learn more?

The EU-MACS project together with its twin project MARCO produced a collection of written publications that discuss how climate services are and can be used within the tourism sector.

Updated lists of EU-MACS and MARCO publications:

http://eu-macs.eu/outputs/

http://marco-h2020.eu/results/