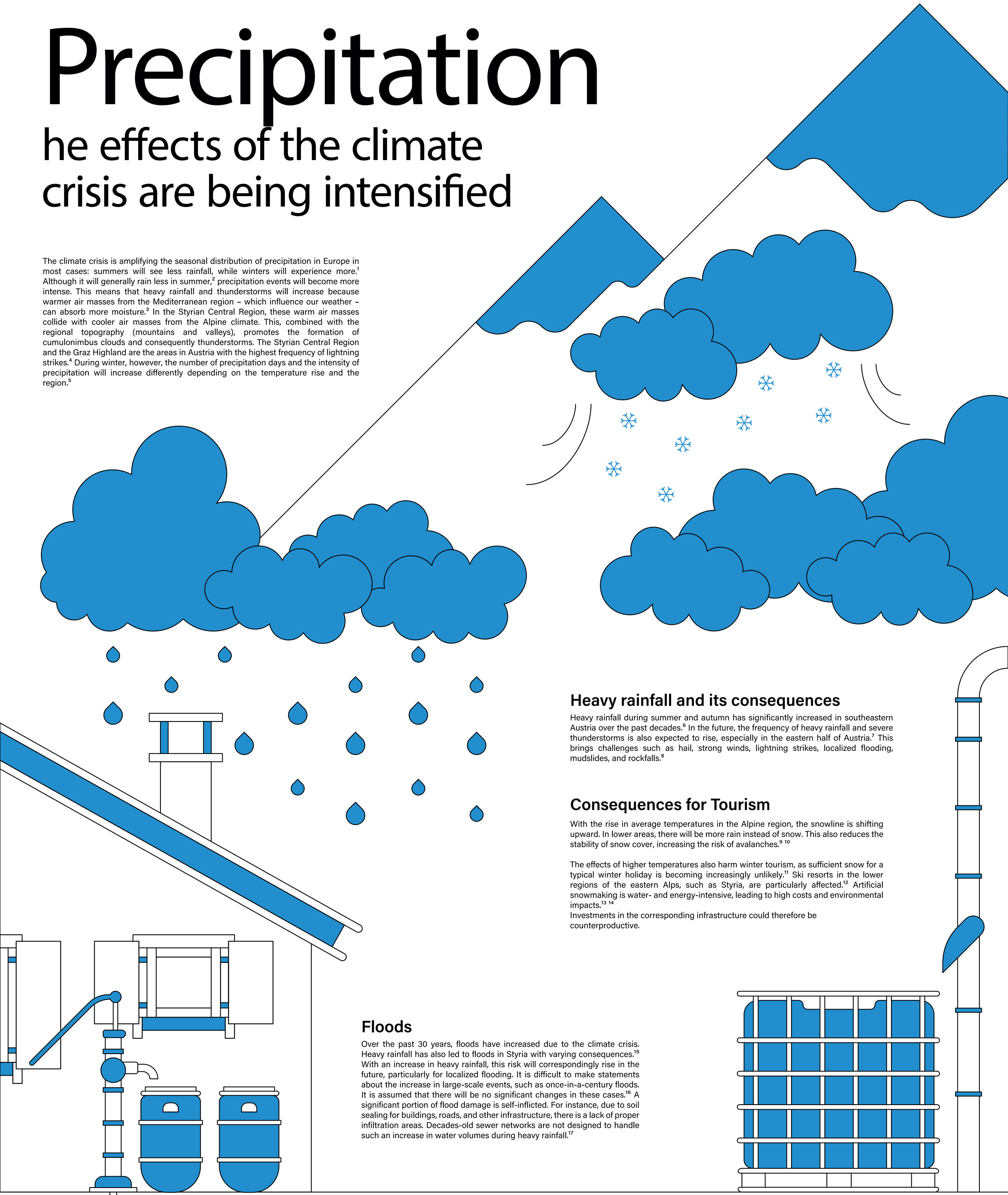
Precipitation

he effects of the climate crisis are being intensified

The climate crisis is amplifying the seasonal distribution of precipitation in Europe in most cases: summers will see less rainfall, while winters will experience more.[1] Although it will generally rain less in summer,[2] precipitation events will become more intense. This means that heavy rainfall and thunderstorms will increase because warmer air masses from the Mediterranean region – which influence our weather – can absorb more moisture.[3] In the Styrian Central Region, these warm air masses collide with cooler air masses from the Alpine climate. This, combined with the regional topography (mountains and valleys), promotes the formation of cumulonimbus clouds and consequently thunderstorms. The Styrian Central Region and the Graz Highland are the areas in Austria with the highest frequency of lightning strikes.[4] During winter, however, the number of precipitation days and the intensity of precipitation will increase differently depending on the temperature rise and the region.[5]



Heavy rainfall and its consequences

Heavy rainfall during summer and autumn has significantly increased in southeastern Austria over the past decades.[6] In the future, the frequency of heavy rainfall and severe thunderstorms is also expected to rise, especially in the eastern half of Austria.[7] This brings challenges such as hail, strong winds, lightning strikes, localized flooding, mudslides, and rockfalls.[8]

Consequences for Tourism

With the rise in average temperatures in the Alpine region, the snowline is shifting upward. In lower areas, there will be more rain instead of snow. This also reduces the stability of snow cover, increasing the risk of avalanches.[9] [10]

The effects of higher temperatures also harm winter tourism, as sufficient snow for a typical winter holiday is becoming increasingly unlikely.[11] Ski resorts in the lower regions of the eastern Alps, such as Styria, are particularly affected.[12] Artificial snowmaking is water- and energy-intensive, leading to high costs and environmental impacts.[13] [14]
Investments in the corresponding infrastructure could therefore be counterproductive.

Floods

Over the past 30 years, floods have increased due to the climate crisis. Heavy rainfall has also led to floods in Styria with varying consequences.[15] With an increase in heavy rainfall, this risk will correspondingly rise in the future, particularly for localized flooding. It is difficult to make statements about the increase in large-scale events, such as once-in-a-century floods. It is assumed that there will be no significant changes in these cases.[16] A significant portion of flood damage is self-inflicted. For instance, due to soil sealing for buildings, roads, and other infrastructure, there is a lack of proper infiltration areas. Decades-old sewer networks are not designed to handle such an increase in water volumes during heavy rainfall.[17]

Damage to Agriculture

Agriculture is highly dependent on rainfall. If precipitation is absent in winter, the soil will not have enough moisture in spring. The lack of snow cover also poses a risk to sufficient soil water saturation. Relying on groundwater for irrigation, especially in conjunction with prolonged heatwaves, becomes a problem. This can also endanger the drinking water supply.[18] Southeastern Styria is particularly affected by both heavy rainfall and the absence of precipitation.

[1] vgl. IPCC, 2021, S. 584f.
[2] vgl. APCC, 2019, S. 34
[3] vgl. IPCC, 2021, S. 596
[4] vgl. ZAMG, 2022b
[5] vgl. APCC, 2019, S. 31f
[6] vgl. APCC, 2019, S. 24
[7] vgl. ZAMG, o. J. d
[8] vgl. APCC, 2019, S. 33
[9] vgl. APCC, 2014, S. 559
[10] vgl. APCC, 2019, S. 38
[11] vgl. IPCC, 2022b, S. 1852, 1855
[12] vgl. APCC, 2014, S. 668f.
[13] vgl. APCC, 2014, S. 589
[14] vgl. IPCC, 2022b, S. 1852, 1855
[15] vgl. Land Steiermark, 2017a, S. 22f.
[16] vgl. APCC, 2019, S. 33, 38, 40, 244
[17] vgl. APCC, 2019, S. 160
[18] vgl. APCC, 2019, S. 38

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