Producing fuel ethanol from inedible and abundantly-available cellulose biomass offers an important opportunity to sustainably produce alternative transportation fuels. This would be extremely beneficial from economic and environmental standpoints. Although significant progress has been made to reduce the manufacturing costs, widespread commercialization of this technology has not been realized. Before bioethanol can become an economic alternative for transportation fuel, there will need to be more efficient pretreatment methods, further reduction of biological enzyme costs, and development of more efficient genetically engineered microorganisms.

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SNOW AS AN INDICATOR OF THE ENVIROMENT

The cryosphere [1] consists of water in the solid form at the Earth's surface and includes snow, sea ice, glaciers and ice sheets. Since the 1990s the cryosphere and its components have often been considered as indicators of global warming because rising temperatures can enhance the melting of solid water.

Changes in the cryosphere are often easier to recognize than a global temperature rise of a couple of degrees: many locals and tourists have hands-on experience in changes in the extent of glaciers or the duration of winter snow cover on the Eurasian and North American continents. Contemporary sedimentation processes also play a significant role in shaping urban environmental quality. In addition to natural factors, such as weathering and erosion, there is an intense anthropogenic impact on exposed surfaces in urban areas. Snow cover interacts with contaminants and modifies the depositional process. Due to its porous structure, snow can accumulate and store a large quantity of pollutants and road-wear products. Snowbanks along urban highways act as passive sinks for both metal elements and solids generated by traffic and maintenance activities. The heavy metal concentrations [2] in the snow increase towards the center of the city. They were influenced by local pollution in the industrial area of the city and by the effect of the seasonal wind from the northwest. The elemental concentrations in urban snow were from several to tens of times higher than background levels. The main concentrations of the elements studied were in the order Mn > Zn > Pb > Cu > Cr > Cd, the same as in water except for Pb. The data on trace metal concentrations in snow are a reliable guide to the degree of air pollution, and can be used as a simple and effective indicator of urban air pollution.

The behavior of snow is not the result of a simple cause-and-effect relationship between air temperature and snow. It is instead related to a rather complex interplay between external meteorological parameters and internal processes in the snowpack.

While air temperature is of course a crucial parameter for snow and its melting, precipitation and radiation are also important. Further physical properties like snow grain size and the amount of absorbing impurities in the snow determine the fraction of absorbed radiation. While all these parameters affect the energy budget of the snowpack, each of these variables can dominate depending on the season or on environmental conditions. Snow cover is an important feedback mechanism of the climate system.

The extent of snow cover depends on the climate. But it also influences the climate and climate-related systems because of its high reflectivity, insulating properties, effects on water resources and ecosystems, and cooling of the atmosphere.

Thus, a decrease in snow cover reduces the reflection of solar radiation, contributing to accelerated climate change. Changes in the extent, duration, thickness and properties of snow cover can affect water availability for domestic use, navigation and power generation. Changes in snow cover affect human well-being through influences on agriculture, infrastructure, and livelihoods of indigenous. Snow-cover retreat can reduce problems of winter road and rail maintenance, affecting the exploitation and transport of oil and gas in cold regions.

Shallow snow cover at low elevations in temperate regions is the most sensitive to temperature fluctuations and hence most likely to decline with increasing temperature. For several of these impacts, adaptation can reduce the negative effects of snow-cover change. Some adaptation options, such as artificial snowmaking in the Alps to maintain tourism as a main source of income, have to be balanced against their negative implications for mitigation, due to increased energy use and greenhouse gas emissions.

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LACKFARBENINDUSTRIE UND IHREN SCHÄDLICHEN EINFLUSS AUF DIE UMWELT

Zum ersten Mal begann man Farben vor etwa 30 000 Jahren verwenden. Die Menschen benutzten Gemische von lackierten Ton, Ruß, Fett und anderen natürlichen Substanzen, um ihren Körper, Häuser und religiösen Orte zu schmücken. Ein Beispiel ist Höhlenmalerei von Nordspanien. Während der Entwicklung der Zivilisationen von Ägypten, Griechenland und Rom wurden komplexe Methoden zur Färbung für die Dekoration von Schiffen, Statuen, Arbeitsinstrumente verwendet. Als Rohstoff verwendete man Pflanzenharze, Stärke, Dosierklebstoff, Bienenwachs, Holzkohle und verschiedene Mineralien. Für Textilfärbungen, Holz und Leder wurden natürliche Farbstoffe wie Indigo, lila und schönes Granat gebraucht.

Aufgrund der Entwicklung der Industrie und der Nachfrageerhöhung nach Farben und Lacken wurde es immer schwieriger, mit natürlichen Materialien zu arbeiten. Die meisten Pflanzenmaterialien wurden durch chemische Komponenten ersetzt, solche wie Lösungsmittel (Alkohole, Ketone, Ether), filmbildende Substanzen (Alkydharze, Acrylharze) und Pigmente (Titandioxid, Chromoxid, Ultramarin).

Der Herstellungsprozess von Farben und Lacken wird durch Vergiftung und Verschmutzung der Umwelt begleitet, da der Abfall und die Produkte selbst verschiedene Chemikalien enthalten, die der menschlichen Gesundheit nicht nur große Schäden verursachen können, sondern auch eine Verletzung des ökologischen Gleichgewichts verursachen.