

MARTIAN SEASONAL CLIMATE ANALYSIS

A Post-Hex Impact Simulation: Mars at T+1000 Years (610 mBar Atmosphere)

Executive Summary

Baseline Environment: Surface Pressure stabilized at ~610 mBar, Mean Temperature +15°C.

Seasonal Engine: Driven by 25.2° axial tilt (similar to Earth's 23.5°) and high orbital eccentricity.

Acclimatization: A 'high-altitude' environment (4,000m Earth equivalent).

Unprotected breathing is viable only for fully acclimatized populations.

This document outlines the climate dynamics of the "New Mars" (T+1000y), a temperate world stabilized by a dense atmosphere (610 mBar). While seasons now support complex biology and unpressurized habitats, the orbital eccentricity creates unique seasonal asymmetries.

Martian Seasons: Metrics and Asymmetries

Due to the elliptical orbit, southern hemisphere seasons are more extreme and shorter than northern ones.

Spring (Verte)

A transitional season defined by melting snowpack (primarily northern water ice) and rapid biological awakening.

- **Global Mean Temp:** +18°C
- **Mid-Latitude High:** +22°C
- **Surface Pressure:** ~615 mBar
- **Atmospheric Note:** Temporary pressure rise due to polar sublimation. Light snow/dust fogs.

Summer (Estivale)

The peak growing season. Large temperature gradients between the warm equator and cool poles drive active weather.

- **Global Mean Temp:** +25°C
- **Equatorial High:** +32°C
- **Surface Pressure:** ~620 mBar (Peak)
- **Atmospheric Note:** Highest stable pressure. Strong pressure gradients.

Autumn (Automne)

The cooling phase. Defined by the return of frost to mid-latitudes and the first substantial snowfall on high plateaus.

- **Global Mean Temp:** +15°C
- **Global High:** +20°C
- **Surface Pressure:** ~605 mBar
- **Atmospheric Note:** Pressure stabilizes; decreasing fogs as moisture freezes out.

Winter (Hiver)

The cold season, now moderated. Polar water ice forms (CO₂ ice is prevented). Snowfall is significant but manageable.

- **Global Mean Temp:** +5°C
- **Mid-Latitude Low:** -10°C
- **Surface Pressure:** ~600 mBar (Lowest)
- **Atmospheric Note:** Moisture is largely frozen; clear, cold skies dominate. Significant Northern snowfall.