

Did you 'Fall Back' Today?

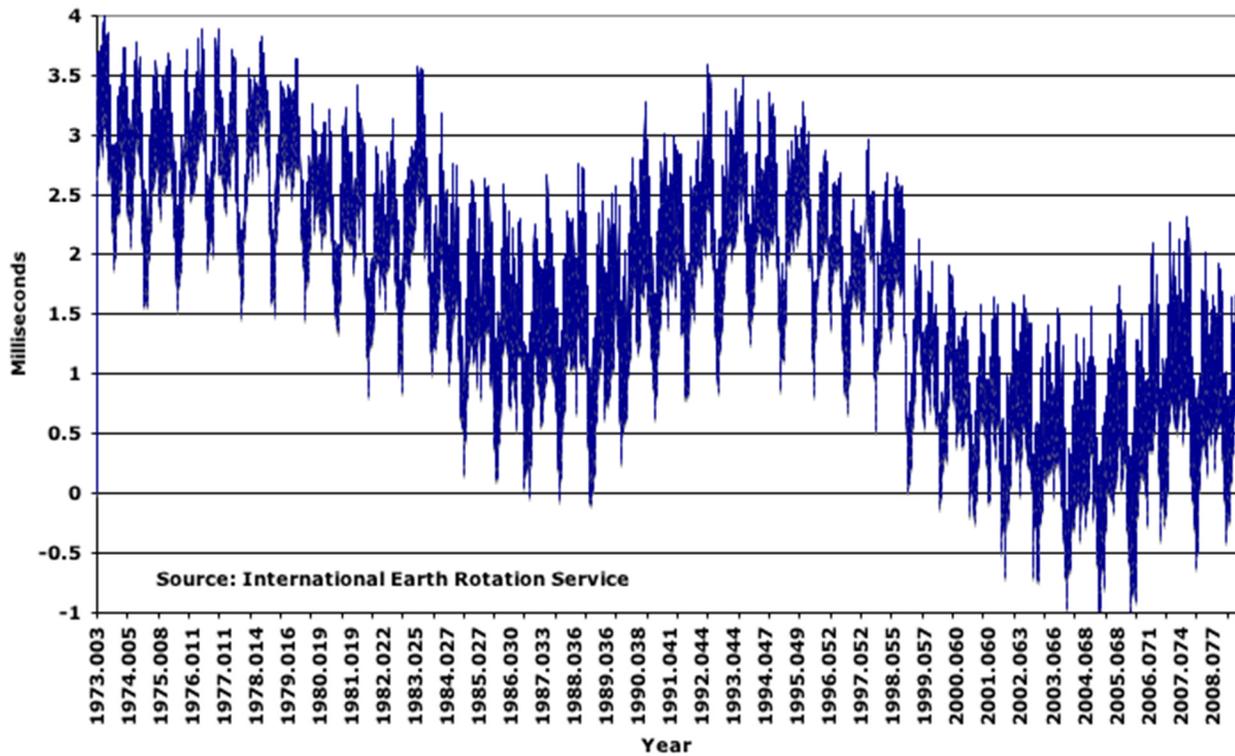


Yes this morning at 2AM Daylight Savings Time (DST) we switched to Standard Time (ST) and turned our clocks back 1 hour.

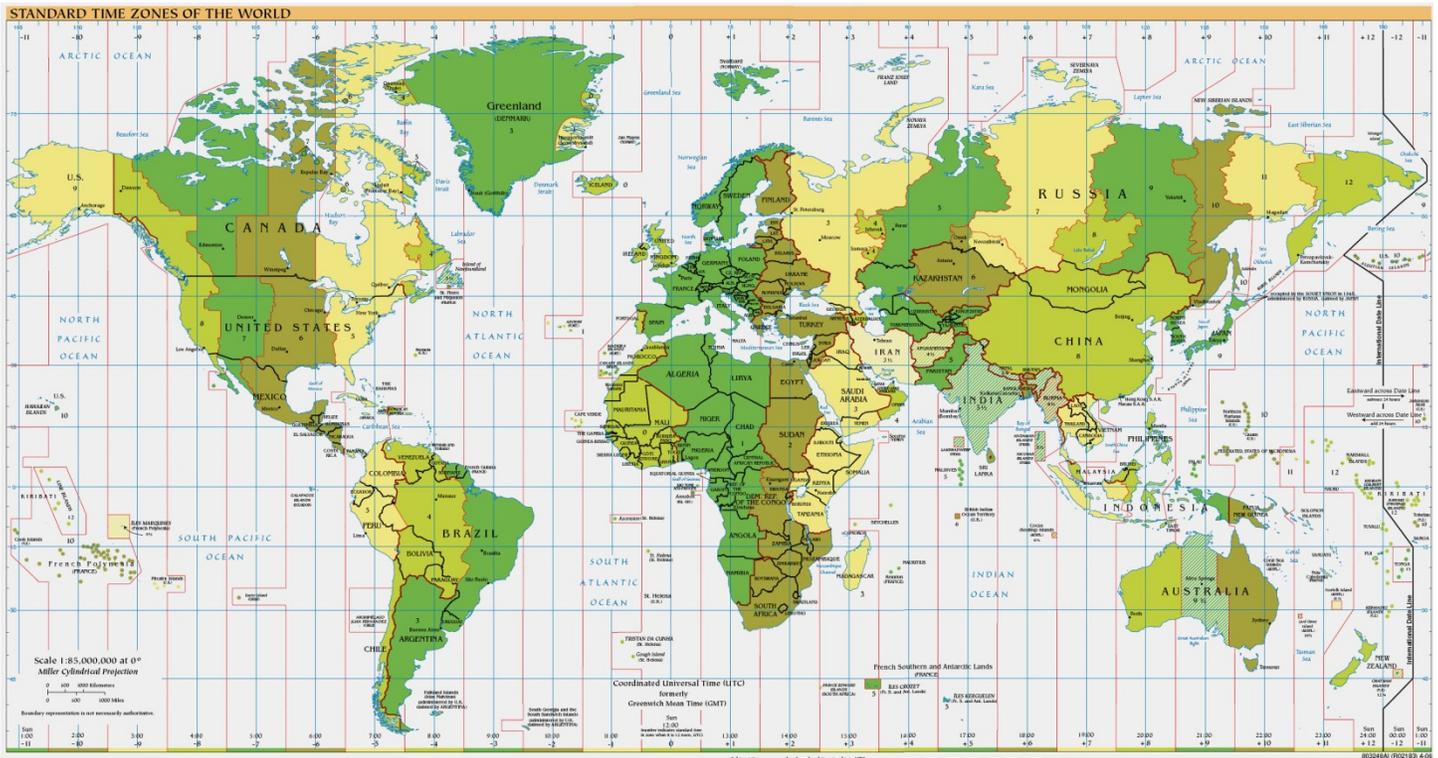


Time is basically calculated based on Earth's rotation, which determines the length of an Earth Day. The rotation of our planet is variable.

Variability of Earth's Rotation: (Length of Day - 86400 seconds)



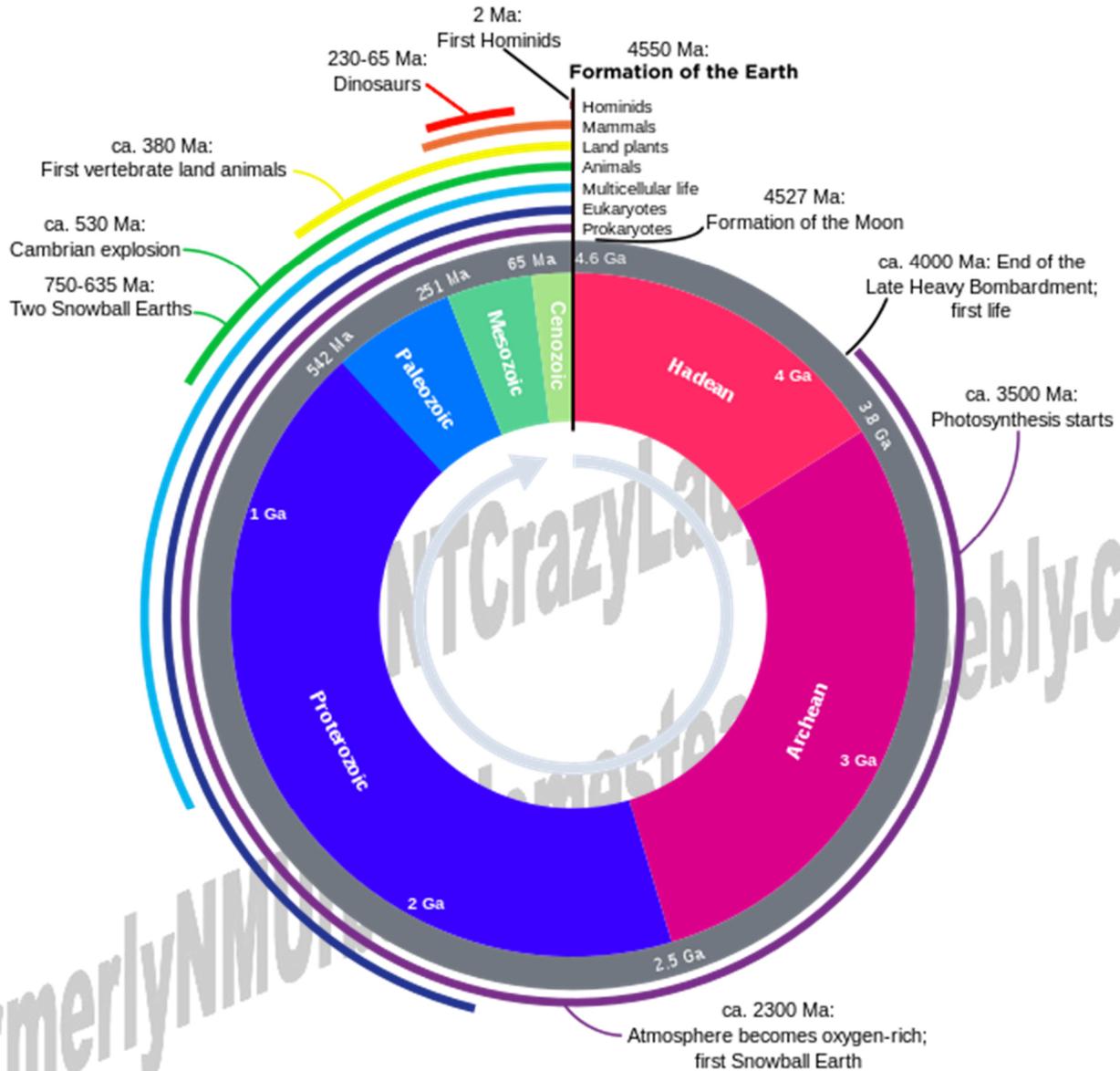
Because of the variable rotation time of the planet and all that 'orb' science, the earth is divided into various time zones.



There are all kinds of 'time' or systems of time and our methods of keeping time have changed over the centuries.



Geologic Clock



Systems of Time

- **Atomic Time** , with the unit of duration the *Systeme International (SI) second* defined as the duration of 9,192,631,770 cycles of radiation corresponding to the transition between two hyperfine levels of the ground state of cesium 133. **TAI** is the International Atomic Time scale, a statistical timescale based on a large number of atomic clocks.
- **Universal Time (UT)** is counted from 0 hours at midnight, with unit of duration the *mean solar day*, defined to be as uniform as possible despite variations in the rotation of the Earth.
 - **UT0** is the rotational time of a particular place of observation. It is observed as the diurnal motion of stars or extraterrestrial radio sources.
 - **UT1** is computed by correcting UT0 for the effect of polar motion on the longitude of the observing site. It varies from uniformity because of the irregularities in the Earth's rotation.

- **Coordinated Universal Time (UTC)** differs from TAI by an integral number of seconds. UTC is kept within 0.9 seconds of UT1 by the introduction of one-second steps to UTC, the "**leap second.**" To date these steps have always been positive.
- **Dynamical Time** replaced *ephemeris time* as the independent argument in dynamical theories and ephemerides. Its unit of duration is based on the orbital motions of the Earth, Moon, and planets.
 - **Terrestrial Time (TT)**, (or Terrestrial Dynamical Time, **TDT**), with unit of duration 86400 SI seconds on the geoid, is the independent argument of apparent *geocentric* ephemerides. $TDT = TAI + 32.184$ seconds.
 - **Barycentric Dynamical Time (TDB)**, is the independent argument of ephemerides and dynamical theories that are referred to the *solar system barycenter*. TDB varies from TT only by periodic variations.
- **Geocentric Coordinate Time (TCG)** is a *coordinate time* having its spatial origin at the center of mass of the Earth. TCG differs from TT as: $TCG - TT = L_g \times (JD - 2443144.5) \times 86400$ seconds, with $L_g = 6.969291e-10$.
- **Barycentric Coordinate Time (TCB)** is a *coordinate time* having its spatial origin at the solar system barycenter. TCB differs from TDB in rate. The two are related by: $TCB - TDB = iL_b \times (JD - 2443144.5) \times 86400$ seconds, with $L_b = 1.550505e-08$.
- **Sidereal Time**, with unit of duration the period of the Earth's rotation with respect to a point nearly fixed with respect to the stars, is the *hour angle of the vernal equinox*.

Delta T is the difference between Earth rotational time (UT1) and dynamical time (TDT). Predicted values of **UT1 - UTC** are provided by the **Earth Orientation Department**. An example showing the variation of the length of the day to late 2008 is shown below. Units are milliseconds.

When told the reason for Daylight Saving time the old Indian said,

"Only a white man would believe that you could cut a foot off the top of a blanket
and sew it to the bottom of a blanket
and have a longer blanket."

Author Unknown



For more information on how we came to today's system of time see **Fall Back – Spring Forward** @ <http://www.scribd.com/doc/71738932/Fall-Back-Spring-Forward>



For making the most of your time see **Time – Tracking It & Making It** at <http://www.scribd.com/doc/62443848/Time-%E2%80%93-Tracking-It-Making-It>



Winter is just around the corner so be sure to hit those Fall & Winter To Do's. For more information see **Fall To Do's - Preparing for Winter** @ <http://www.scribd.com/doc/65838445/Fall-to-Do-s-Preparing-Winter> and **Winter Preparedness & To Do's** @ <http://www.scribd.com/doc/70394185/Winter-Preparedness-To-Do-s>

TNT



Prepin'

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