

# ATLAS

## A Layman's Guide to Advanced Climate Prediction

**P**redicting climate has never worked very well. Within a short period of time general circulation models fail as errors accumulate and this has led to the commonly held view that climate, in the long term, is simply unpredictable. But Atlas changes everything because its unique physics engine ties local variations in temperature and precipitation to the real drivers of global climate--the regular cycles of the Earth's motion and the dynamic interaction between them. Here's how it works...



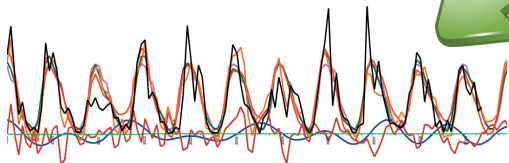
### All Climate Is Local

The weather history of any point on earth shows temperature and precipitation constantly going up and down. This natural variation is a result of energy flowing into and out of that location.



### Earth's Motion Drives Climate

These energy flows derive from numerous periodic forces that affect global climate. These forces are periodic for the simple fact that they all result from the spinning, orbiting and wobbling of the earth and from the variations in solar energy. Ultimately all weather patterns result from the planet's motion in an active solar system--which is entirely cyclical-- hence there is an underlying periodic and *predictable* order to climate.



### Climate Processes Interact Dynamically

These energy cycles interact with one another, creating additional harmonics that are not obviously connected to physical causes. These harmonics and subharmonics occur in a complex but highly ordered fashion--mathematicians call it period doubling--which provides a new, more reliable tool to predict climate.



$$\frac{\partial}{\partial a} \int_{R_a} T(x) f(x, \theta) dx = \int_{R_a} \frac{\partial T(x)}{\partial a} f(x, \theta) dx$$

$$\frac{\partial}{\partial a} \ln f_{a, \sigma^2}(\xi_1) = \frac{(\xi_1 - a)}{\sigma^2} f_{a, \sigma^2}(\xi_1) = \frac{1}{\sigma^2} \left( \xi_1 - a \right)$$

$$\int_{R_a} T(x) \cdot \frac{\partial}{\partial \theta} f(x, \theta) dx = M \left( T(\xi) \cdot \frac{\partial}{\partial \theta} \ln L(\xi, \theta) \right)$$

$$\int_{R_a} T(x) \left( \frac{\partial}{\partial \theta} \ln L(x, \theta) \right) \cdot f(x, \theta) dx = \int_{R_a} T(x) \left( \frac{\partial}{\partial \theta} \ln L(x, \theta) \right) f(x, \theta) dx$$

$$\frac{\partial}{\partial \theta} M T(\xi) = \frac{\partial}{\partial \theta} \int_{R_a} T(x) f(x, \theta) dx = \int_{R_a} \frac{\partial T(x)}{\partial \theta} f(x, \theta) dx$$

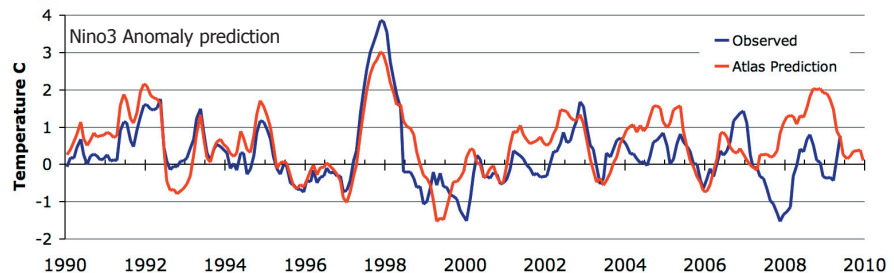
$$\left( \frac{\partial}{\partial \theta} \right) \left( \frac{\partial}{\partial \theta} \right) \left( \frac{\partial}{\partial \theta} \right)$$

### The Harmonics of Climate Processes Lead To Accurate Long-Range Predictions

Because the Atlas process does not try to compute a vast fluid mechanical problem, like general circulation models do, such error does not accumulate with time. Atlas predictions are nearly as accurate five years out as they are for next month.

The proof is in a decade of reliable predictions clearly demonstrating that Atlas works. Predictions made in the 1990s are still useful--more than ten years later.

Atlas is the first long-range prediction system that has proven itself over time.



### Atlas Physics Relates Global Climate Processes to Local Conditions

If you had a mathematical way of relating how these harmonics translate to the temperature at any given time and place then you could predict the conditions there at some future time. This is what Atlas does. The mathematics used by Atlas is a solution of the Navier-Stokes equations which describes the energy flow harmonics and produces the time-series of temperature and precipitation.

**ATLAS predictions are available in one through five year versions, in standard and detailed models and for regional and site-specific coverage. Contact Dynamic Predictables to discuss which product is right for your needs.**

## DYNAMIC PREDICTABLES

Multi-Year, Regional and Site-Specific Climate Predictions

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