Golden Gate Climate Update Transcript

Interview with Dr. Robert Cahalan

NASA Climate and Radiation Branch, Goddard Space Flight Center

Interviewed on August 13, 2009

James Osborne interviewer

Part 1

Music begins and fades slightly

James - Hi, I'm Ranger James Osborne, and welcome to Golden Gate Climate Update…, your source for information on climate change and sustainability. Join us as we hear from people helping your National Parks understand and adapt to climate change.

Today we are talking with Dr. Robert Cahalan, head of NASA's Climate and Radiation Branch, based at Goddard Space Flight Center.

Bob, can you tell us a little about your research at NASA and how it relates to the study of climate change and global warming?

Bob - I'd be happy to. I'm part of the Laboratory for Atmospheres here. My group is the Climate and Radiation Branch. We look at the climate on time scales from a few years to millions of years. We look at changes due to various forcings of the climate, such as volcanic eruptions, solar variations, greenhouse gases like carbon dioxide, but we also look at natural changes in the climate, such as El Nino and the Southern Oscillation. We use what's called the earth observing system, which is more than twenty satellites that are observing the whole earth every day and we also monitor the sun's variations.

James - We hear a lot about global warming and how weather will become more unpredictable and extreme as warming progresses. Can you tell us why scientists think there will be more extreme weather?

Bob - Yea, and I think probably the best way into seeing that is to sort of imagine yourself standing on our sister planet, the moon, and looking back at the earth, much like we did actually back in the early seventies with the Apollo mission. The first most obvious feature of the earth are the cloud systems on the earth and probably next you'll notice the polar ice caps of Greenland, and sea ice in the Arctic and then you'll notice the ice cap of Antarctica and the third thing is in between the clouds you'll see through to the dark ocean surface. So, the earth is the water planet. If you were somebody coming like on Star Trek from some other solar system, some other planet, you'd be quite amazed to see this planet. This is the only one in the solar system where you have all three phases of water, because the distance from the sun is just about right to get the temperature near what's

called the triple point and most of the sun's energy that gets absorbed on the earth, or at least half of it, goes into evaporating water. So, it evaporates water from the ocean into the atmosphere, so then you have water as a gas, water vapor, and that condenses into little fine particles in the air and forms clouds and, of course, they precipitate out as snow and hail and rain. That's the water cycle. So, what happens to that when the earth warms up? That water vapor will form more clouds and we get more precipitation and that's why we get more extremes in the weather.

James - Thanks Bob. Sounds like we are in for a steamy as well as a stormy future. Before we move on to our next question, its time for the climate update challenge. Today's question is: "What is the Maunder Minimum and who discovered it?" Hear the answer, and the second half of this interview in part two. Until our next podcast, this is James Osborne, thanks for listening.

Music fades in and then out

Male voice - Golden Gate Climate Update is produced by Will Elder and is a product of the Earth to Sky Program, an innovative partnership between the National Park Service and NASA.

Music from *A Walk in the Desert* by Electronic Symphonic