

Saturday, February 14, 2009 (file cac196)

To: Dan Breedon

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Subj: Global warming objectivity, Evacuation counter message, Soil health sustainability, Transportation Alternatives and snow removal.

Ref A: www.ametsoc.org/, Importance of Objectivity in driving beliefs and attitudes, Meteorological Workshop Lecture broadcast on Research Channel on 2/12/09

Ref B: Geoscience and Remote Sensing Newsletter, Cumulative Issue #1239, Dec 2008, ISSN 0247-6338, John. Kerekes & Eric Miller on Geoscience and remote sensing: The Next Generation and J. Gasiewski report on 28th Space Frequency Coordination Meeting.

Ref C: C. Field, Carnegie Institution of Science, Annual Meeting of the American Association for the Advancement of Science, Climate-Changing gases increasing at a faster pace, reported in SacBee Feb 15, 2009, A14

Ref D: Editorial Board SF Chronicle, A Wildfire Idea worth Watching, Feb 12, 09 SF Chronicle A14

Ref E: Robert Cermak and California Fire Safe Consultants, Forest Ranch Wildfire Defense Plan, Prepared in November 1995 for the Forest Ranch Community Association.

Ref F: CDF Butte & Plumas Counties Fire Management Plan 2004,

Ref G: Associated Press, A traumatic tour of ravaged town, and clean air is for the birds, SacBee Feb 15, 2009, A8

H: Courtney White, Revolution on the Range, the Rise of a New Ranch in the American West, Island Press/Shearwater Books, 2008

Global warming: Per Ref A, the American Meteorological Society is shown as a major player in assessing the effects of green house gases on the heat balance of the earth and at the same time objectively reporting to non-experts the bounds on uncertainty associated with measurements. From the general plan point of view, we are likely to find semantic tools and generalities in their web site. In particular I found the message presented by A. Lupa of U. of Michigan on the TV show insightful. Increased moisture in the atmosphere associated with GHG warming and its effect on incident high frequency radiation, H₂O lifetime in the atmosphere, IR absorption and horizontal changes in weather patterns are hot topics that fall in the meteorological society's area of expertise.

As noted previously, one of the largest elements of uncertainty in the heat balance models is the effect of increased moisture entering the atmosphere/troposphere associated with global warming. Ref B looks at many of the technological aspects of measurement of the atmosphere/troposphere /tracer gases from below and above from 1 to 275 GHz. Ref C shows that the CO₂ equivalent emission has been

growing 3.5% /year up sharply from .9% /yr in 2000. This is outside of the IPCC2007 envelope of possibilities. The Western Pacific is now rising .39 in/year. Increased use of coal and land clearing in the tropics to provide biofuels are prime candidates for blame. Planting biofuel crops/forests on degraded/non-productive land is suggested for remediation. Ref G also notes the evidence of global warming in the northward movement of birds. In the past 40 years the average January temperature for the lower 48 states rose 5 deg F. It is predicted that California landscape will lose 6, 14 or 19% of their species for low, moderate or high emission of GHG. Per the annual Audubon Christmas count, the "hot spots for loss" were Mohave/Sonora deserts, eastern Sierra Nevada, Central Valley, Modoc Plateau and portions of the Cascade and Coast Range. Individuals currently may well question the reality of average global warming amidst rising levels of snow covering their windows from colliding water laden semi-tropic air and cold air from the north should note the prediction of a large variance in climate in our area derived from IPCC2007 and documented in Science Magazine.

Evacuation Counter Message: When a wildfire is bearing down on your home instead of evacuating a well-drilled resident, the maverick message presented by Ref A describes a well-drilled resident-fit, wary and prepped with a fire resistant home with a chance of riding out a natural inferno. California State officials dislike the approach but Ventura and Orange Counties want to push ahead. Ventura Fire Chief Bob Roper has prepared an 11 page guide on stay and defend tactics and believes that 1/3 of his residents are willing to prepare their homes and stay put in the face of a blaze. In Ref E under the ABC's of Getting Ready for a Wildfire is list of what to do if you stay.

- a. Wear the right clothes. Cotton jeans/shirt/socks (no synthetics) leather boots/gloves, hard hat, goggles/safety glasses
- b. Remove burnable items from around the house.
- c. Close off all vents.
- d. Cover/close windows.
- e. Remove flammable drapes/curtains.
- f. Leave doors/windows unlocked and lights on.
- g. Open stove or fireplace dampers to equalize pressure in the house.
- h. Turn off all pilot lights/fuel lines.
- i. Place ladder to the roof on the opposite to the side of the approach of the fire.
- j. Hook up garden hoses and test them.
- k. Shut off all water not needed for firefighting.
- l. Start auxiliary electric power source if available and lay out large fire hose/fire nozzle connected closely to main system bladder tank.
- m. Fill every available container with water (including bathtub)
- n. Prepare wet towels and rags
- o. Go inside the house until the fire front passes.
- p. After fire front passes, check roof, attic and other hazardous areas for sparks or fire continuing for 4 hours after passage of the fire front.

Wiley has a two volume set on firefighting at Chico State that looks at some of the subtle problems of non-professional fire suppression as a subset, e.g. individuals may put on an organic paint mask that minimizes irritant components from the fire and fall into an eternal sleep from carbon monoxide. In many cases such as the Victoria, Australia, wildland fire catastrophe people/vehicles ended up in many cases running from one end of a soccer field to the other to avoid the flames because no safe evacuation was possible or "stay and defend" was not considered a viable option. Ref G dramatizes the death of a grandfather staying to save a home in the eyes of a grandson that suggests that a conservative approach is desirable provided that escape is possible. If nothing else, we need to head off heroic activities seen in pictures in California with individuals in bathing suits on their roofs with a garden hose dealing with IR radiation levels possibly approaching 50 kw/meter² from a passing fire front and failing water sources. From a societal cost point of view, the billions spent on fire suppression and human risk could be reduced by education noting this option. Care must be taken to minimize the liability associated with poorly written instructions. Forest Service research on flame fronts show that the integrated thermal energy is relatively independent of the flame front forward speed, so for a given basal area the required structure fire resistance is nearly constant and therefore can offer hope of being validated on a post-fire basis. (That may have been a good plan for fire X by what about fire Y of the future for different conditions thereby defeating attempts at generalization). This observation should not be mixed up with the fact that unprotected skin will suffer a 2nd degree burn in 5 seconds at a common IR level of 15 kw/m² as a flame front passes. A "standard" burn patient at U.C. Davis burn center facing a life threatening recovery over a long period would take little comfort from the "standard" scorch level of OSB observed in the FS experiments. Ref F pp71-72 describe Battalion 2 Fuel Reduction in and around Forest Ranch. Nowhere in Ref F is specific mention made of the Stay and Defend option aside from creating a defensible space (Implicitly for professional fire suppression personnel).

Soil Sustainability: Ref H addresses the problem of maintaining healthy soil, using grazing animals and idealized slash treatment. The side benefits include reduced wildland fire fuel reduction, optimizing available nutrients/moisture for vegetation, ground water recharge, erosion control and aesthetics. On P 172 White makes the point that ecological understanding in recent decades has seen a broad shift within the science community from the idea of a "balance of nature" approach to the "flux of nature" in which disturbances or "pulses of energy" such as fire, wind, and animal impact are seen as natural occurrences and key to the maintenance of land health. Studies in the Jemez Mountains on logging and grazing by Craig using a "splatterter /chain flail on an excavator" demonstrate that this is an efficient tool for marginal land enhancement. This technique was demonstrated by Gary Nakamura of UCCE east of Redding in a tour for non-industrial forest owners several years ago. Fred Provenza of Utah State at Logan has analyzed the behavior of herbivores and management of their behavior to achieve sustainability. USDA, Provenza and his students have launched an educational program called BEHAVE (Behavioral Education for Human, Animal, vegetation and ecosystems). This should not be confused with the finite element surface fire propagation model with the same name used in the Ref E (1995 Forest Ranch Wildfire Defense Plan).

Economic forces driving local reduction in GHG: The following is biased on our family situation but is indicative of short term effects in the market place that may have implications for the general plan. Our

old four wheel drive SUV with a mileage of about 15-17 MPG has had some problems. As a result we looked around for a new vehicle that would suit our needs and help with global warming. After looking at small 3 wheel all-electric vehicles we ended up with a 2 wheel front drive VW four cylinder turbo charged diesel with a mileage of 44 mpg. The small electric vehicles with a charge run distance of 40 miles are a good fit for average sized individuals in urban areas but remote rural areas like Forest Ranch are better served in the short term with a high efficiency petro chemical vehicle with the hope that cellulosic biomass can be converted to fuel in the future. Urban light rail may not be economically feasible in our present economy and human powered vehicles can only serve a fraction of the population. Provision for charging stations may need to be given a priority.

Snow Removal: Ref A described a report of 6 feet of snow at the higher elevations of Forest Ranch in the winter of 1934/1935. We appear to be well on our way to approaching this record. Finding equipment to remove this level of snow is a problem. Solutions like short term use of county or state vehicles on some basis may be worthy of consideration.