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Subj: Geolocation projected services and global warming effects on invasive species

Ref A: C. Hebarty, E. Chatre, Evolution of the Global Navigation Satellite System (GNSS), Proc IEEE Vol 96 #12, Dec 2008, pp1902-1917

Ref B: www.weedcenter.org/wccc/, Steve Dewey, Climate Change may reshuffle Weeds, Overview in Feb 8 09 ER, Full paper in Global Climate Change Biology Journal

Background: The purpose of this paper is to examine future requirements in Butte County and tools that are likely to become available by 2030 for geolocation and weed control that might be included in the general plan.

Typical Butte County unique applications:

1. Close in safe navigation of air tankers and reconnaissance platforms in adverse visibility conditions during major wildfire suppression activities.
2. Mapping with sufficient precision to satisfy requirements for preliminary /final design of projects, vegetation management and circulation.
3. Safety of life services.
4. Location of survey markers.

Tools:

1. Radio Frequency services: Ref A provides a good overview of current and projected services nominally for mobile vehicles . The GNSS system is an outgrowth of GPS (geographic position system) in a variety of improved forms under U.S. military sponsorship and the projected systems such as the Galileo under E.U. sponsorship. These systems utilize non-stationary inclined orbit satellites that provide worldwide coverage. Government and other stakeholders need to be aware that new equipment needs to be compatible with the upper and lower L Band frequency allocations and coding to enhance performance and minimize obsolescence. There are augmentation systems for integrity/availability/propagation correction/precision enhancement typically using geo-synchronous satellites. Automatic dependent surveillance systems that feed ground systems data processing and terrain awareness warning systems for mobile vehicles complete the mix. In some cases, ground based VHF repeaters are available for precise geodesic measurements.
2. Optical services: In addition to conventional theodolite/tape measurement systems, active ranging systems with retrodirective reflectors are available for rapid large scale measurements near the surface and airborne/satellite platforms.
3. Global warming effects on species distribution: Measurement of long term trends on vegetation is advocated by Ref B that gives special attention to opportunities for California

Yellow Star Thistle eradication/ benign substitution. We need to choose economic geolocation measurement system/organization to counter new/old invasive species taking prompt advantage of the drivers posed by global warming. Understanding GIS based sampling above will be essential for cost effective/reliable measurements.

4. Geolociation/communication with distressed individuals and probabation accountable individuals needs to be recognized with shifting social and technological needs.
5. Low data rate reliable/cost -effective/secure reporting of unattended old/new sensors need to be examined.