“Field Reconnaissance Techniques during Emergencies”

GEER Presentation - May 18, 2009 - Richmond Field Station (Berkeley, California)

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USACE Emergency Response:
Flood Control & Coastal Emergencies
(Public Laws 84-99, 93-288 {Stafford Act} & NEPP)

Standard emergency objectives of USACE

- Blue roof missions
- Water missions
- Debris removal mission
- Electric power generators
- Real estate needs for emergencies
- etc as requested by FEMA
- Post emergency evaluations
- Reconstruction

- *Emergency reconnaissance is a small but important part of USACE historical efforts*

Additional USACE Emergency Support Functions:

- Transportation (DOT)
- Firefighting (DOA)
- Information and Planning (FEMA)
- Mass Care (Red Cross)
- Health and Medical Services (DHHS)
- Urban Search and Rescue (FEMA)
- Energy (DOE)
- Flood Fight Support to FEMA

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Disaster Preparation

Emergency Operations

Hazard Mitigation Management

USACE Emergency Response

Emergency Water Assistance

Rehabilitation of Damaged Projects

Advance Measures

US Army Corps of Engineers (USACE) and
USACE Engineer Research Development Center (ERDC)

primary objectives for rapid reconnaissance during natural disaster emergencies

(Subject Matter Expert (SME) deployments)

What is performed (and documented for non engineers);

- Determine mode(s) of failure
- Determine all contributing factors that triggered the failure
- Determine if sequencing of failure is an issue
- Interview people & examine the site looking for non normal issues

a) Failure evaluation of water control structures;

1) Rapidly provide cost effective repair methods for recovery
2) R&D; to change design and evaluation procedures in the future

b) Disaster site safety (providing real-time advise to field command);

1) For safety of emergency workers
2) To determine when normal community activity can resume

Major initiatives that ERDC sees as important for reconnaissance efforts

1) HERO merge with air ARRK

- Helicopter Emergency Reconnaissance Observer (HERO) system (this is last year of development)
- Automatic Road Reconnaissance Kit (ARRK) (a military recon system)

2) Improvements in understanding of how water control structures fail

- Concentrating on marginal failures
- Interviewing people is critical
- Importance of soil modulus differences, cascading failures, human factors, etc

3) Improved field recon methods

- Better selection, use, and transport of basic field equipment
- Better field procedures for documenting observations
- Minimal use of paper in field using “photo signing” methods
- Requirement that all field data is computerized before start of next day
- Pre training in terms of GPS, cameras, procedures, & post processing

Continuation of **Major initiatives**

4) Near real-time rapid reporting to headquarters in Washington DC and local emergency field stations

- Nightly two-level rapid Google Earth presentation of field observations
- Nightly web page publishing
- Better use of E-mail and Contacts in field using BlackBerrys for situation awareness
- Better use of satellite communications (data, voice, SPOT, etc.)

5) Team forming

- USACE Forward Engineer Support Teams (FEST) during emergencies
- Foreign Ministry based government-to-government partnerships in the field
- GEER partnerships with Universities, groups, and other US government agencies

6) USACE/ERDC Changes/Challenges

- USACE ERDC Subject Matter Experts (SME) are now better defined
- ACE-IT is a challenge for USACE (centralized control of computer systems)
- USACE Reach Operations Center (UROC) is providing civil emergency reach back

Helicopter Emergency Reconnaissance Observer (HERO) system

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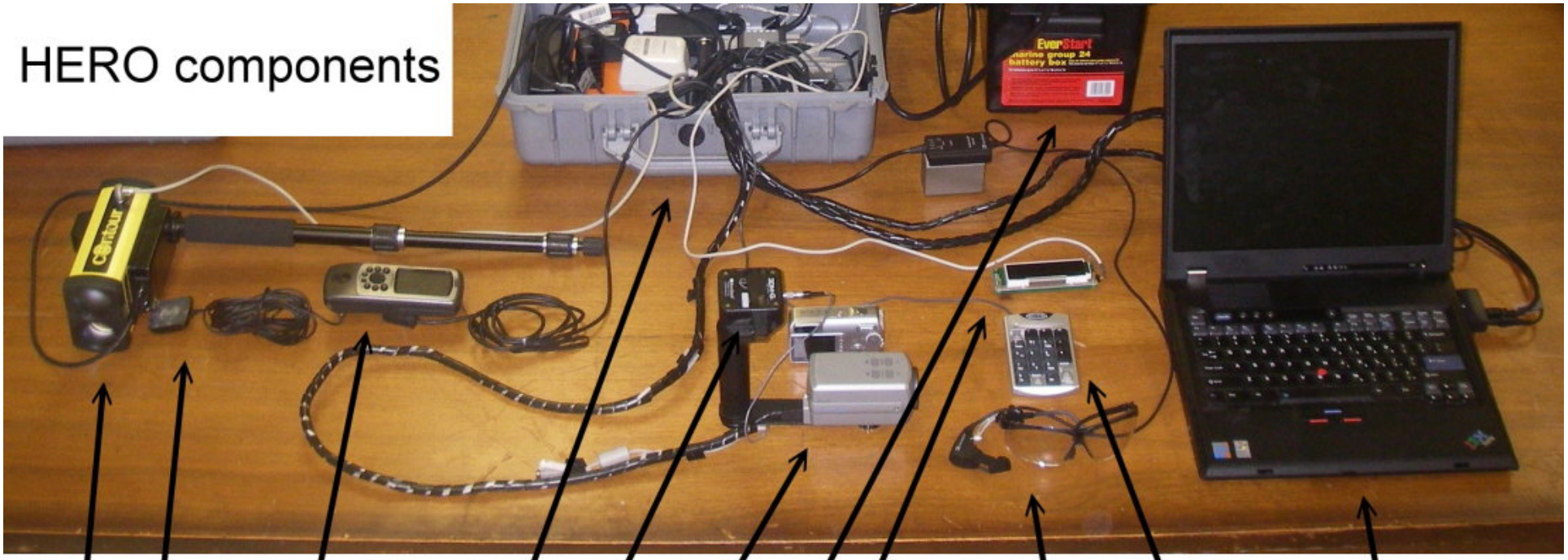
2007 version of the HERO system hardware



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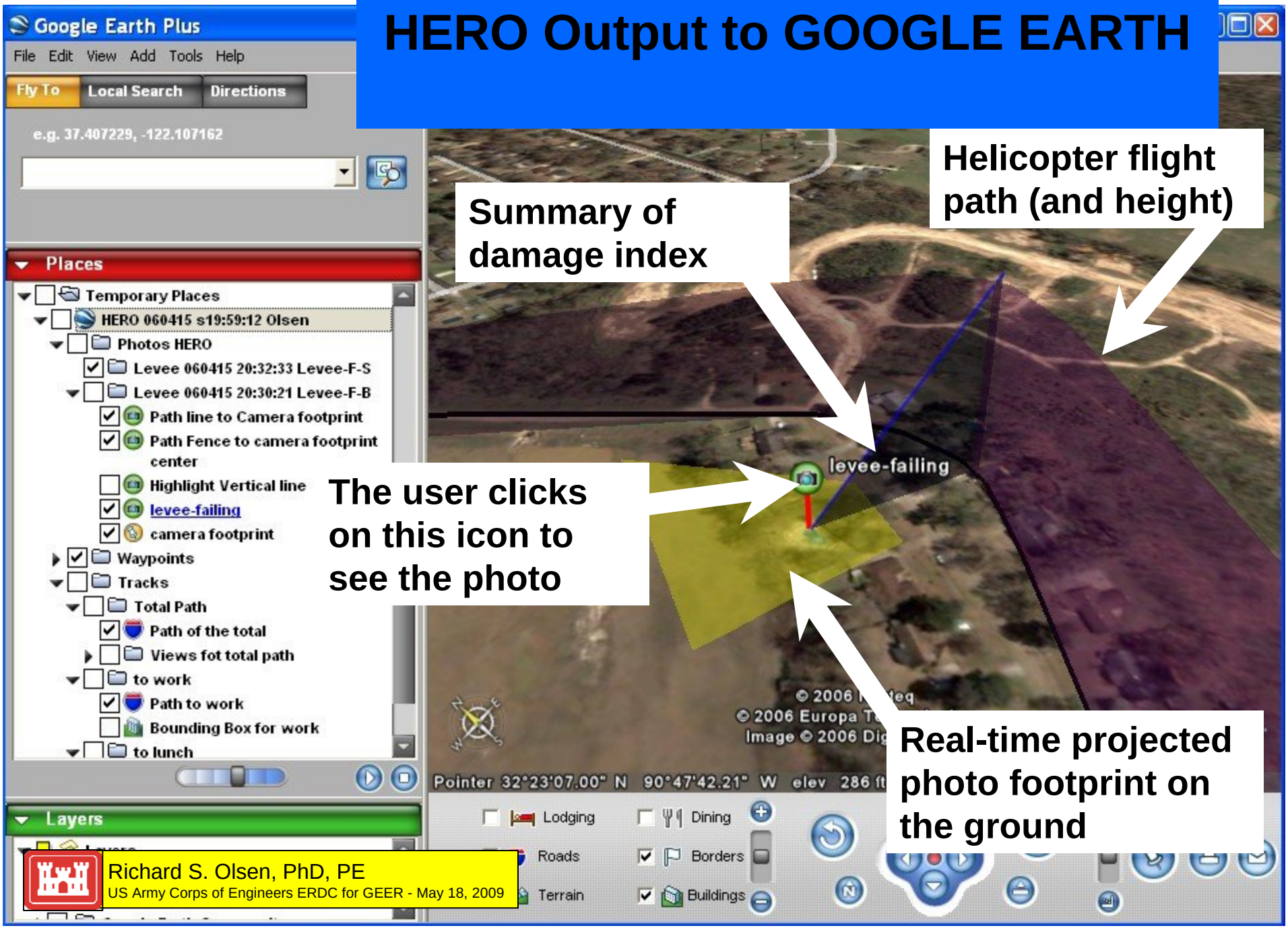
HERO Output to GOOGLE EARTH



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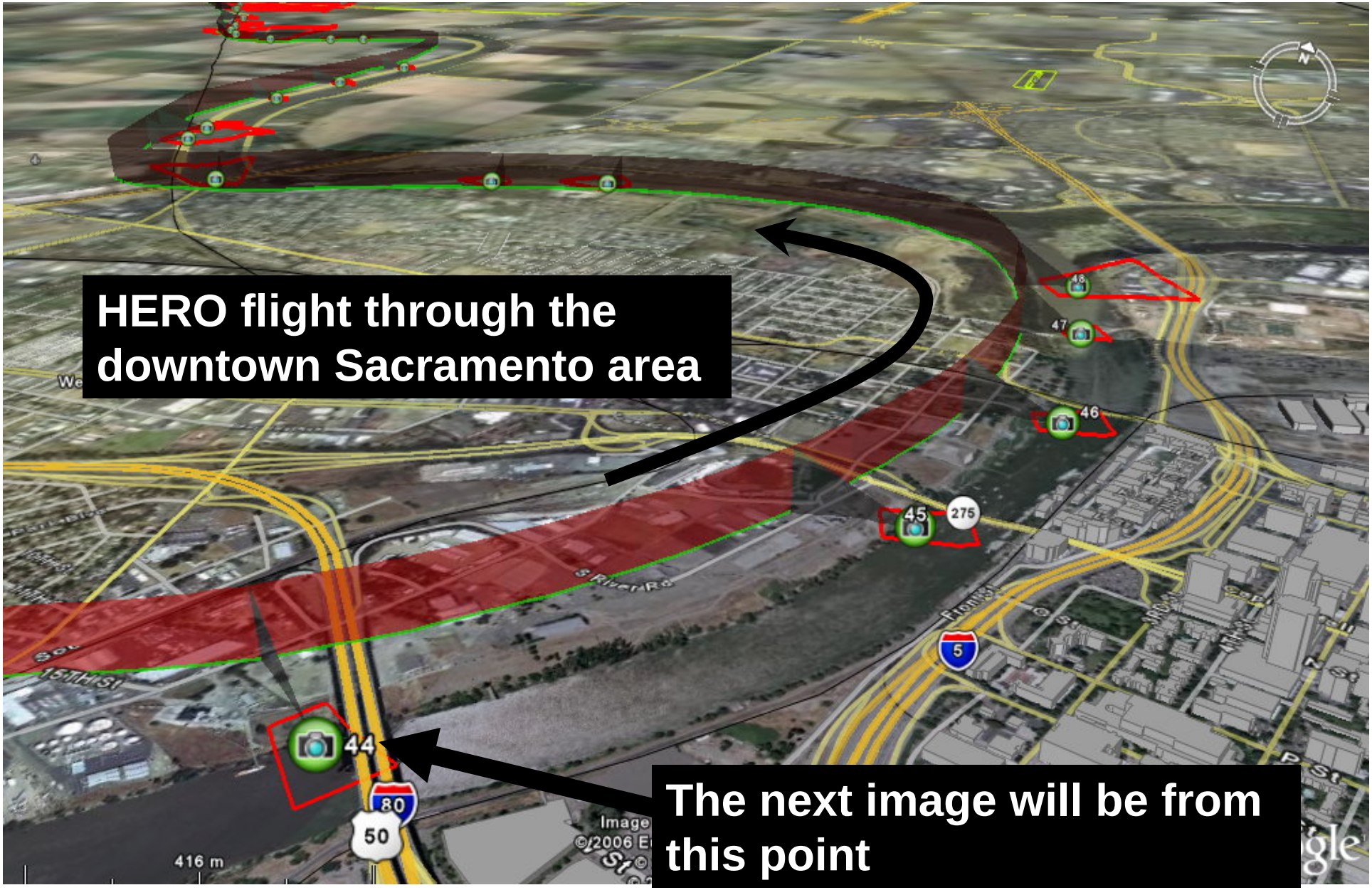

Sacramento demo of HERO in 2007

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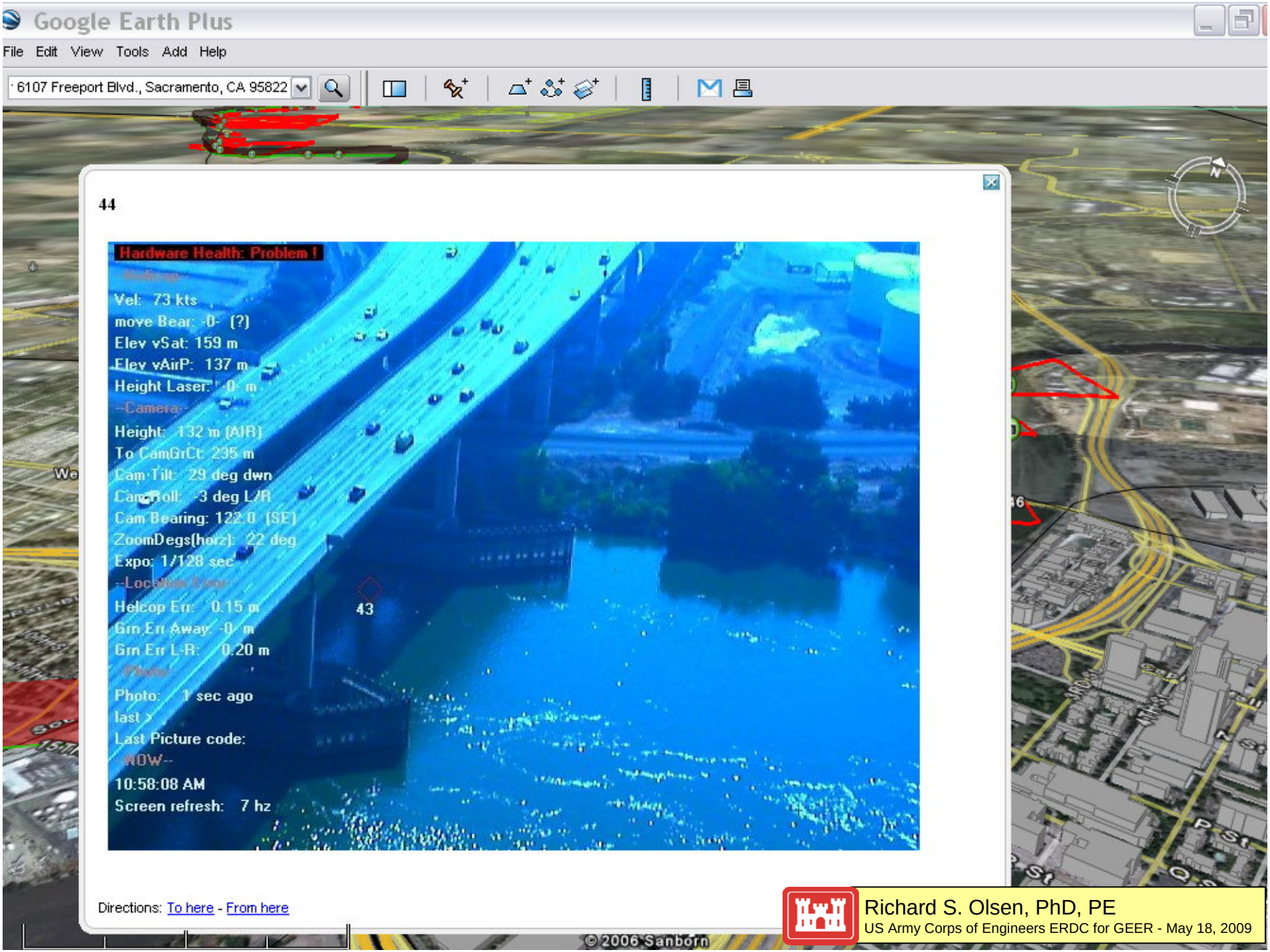

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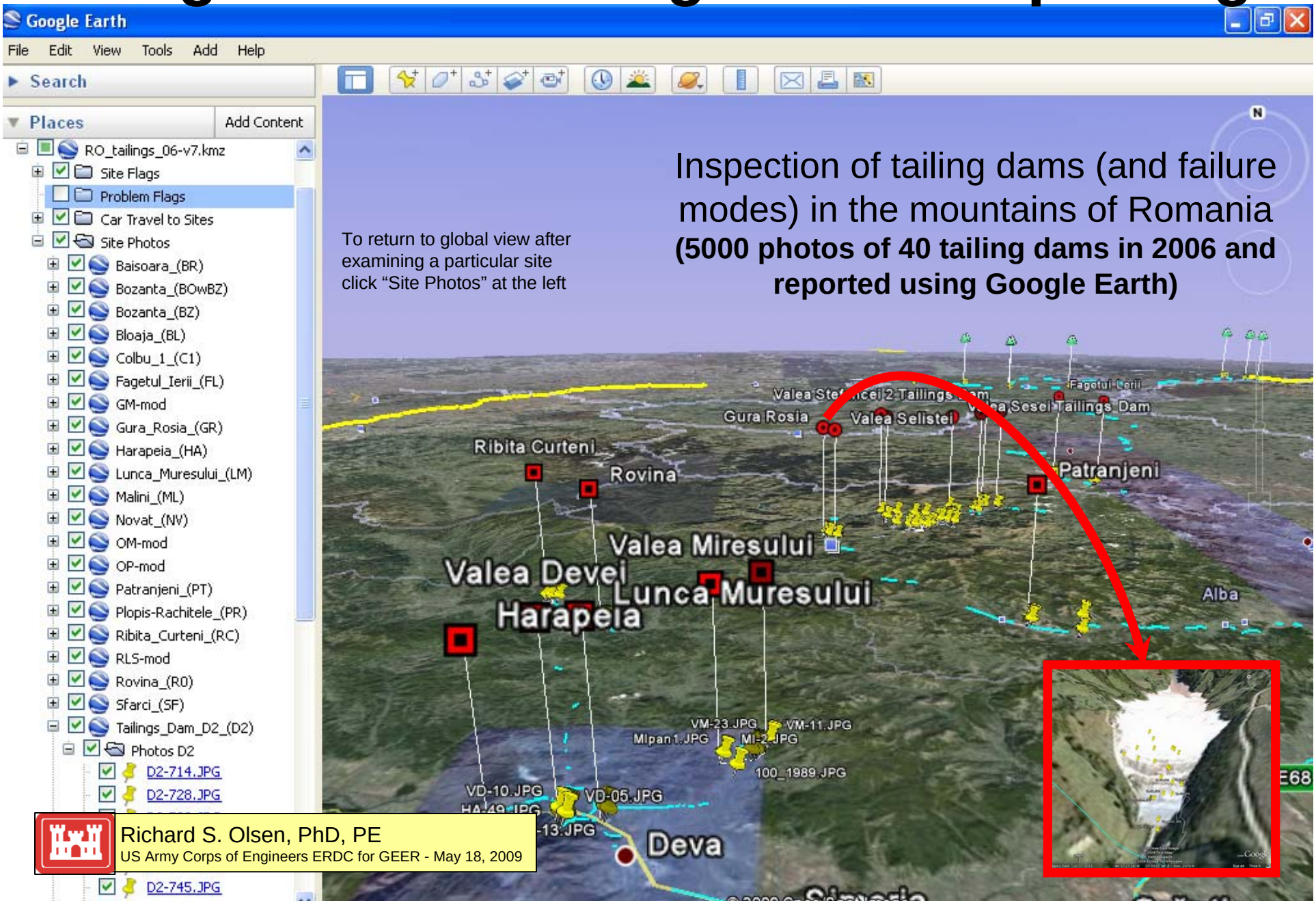
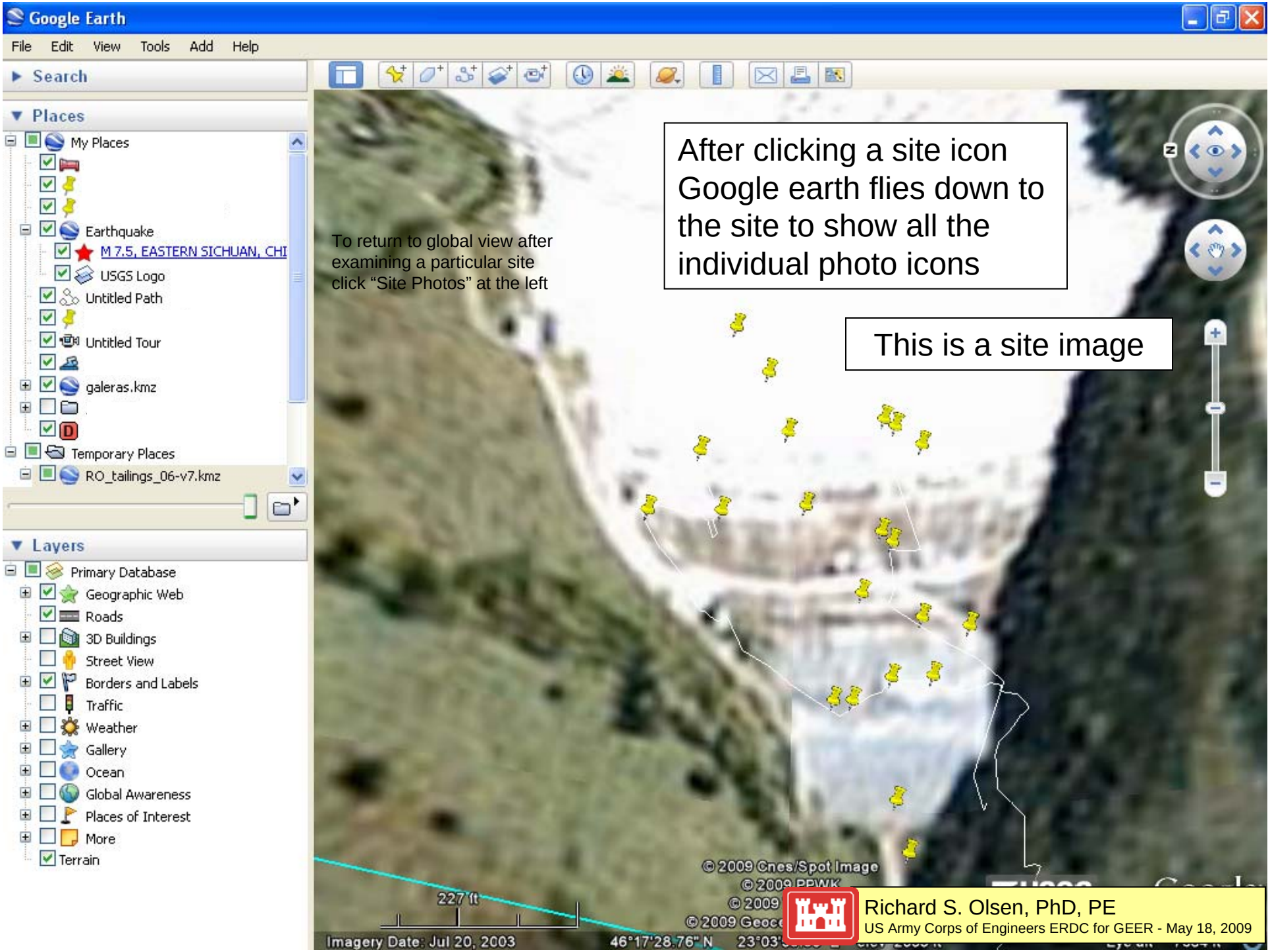
Using two-level Google Earth reporting

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Geographic Web
Roads
3D Buildings
Street View
Borders and Labels
Traffic
Weather
Gallery
Ocean
Global Awareness
Places of Interest
More
Terrain
To return to global view after examining a particular site click “Site Photos” at the left
After clicking a site icon Google earth flies down to the site to show all the individual photo icons
This is a site image
© 2009 Cnes/Spot Image
227 ft
Imagery Date: Jul 20, 2003
46°17'28.76" N
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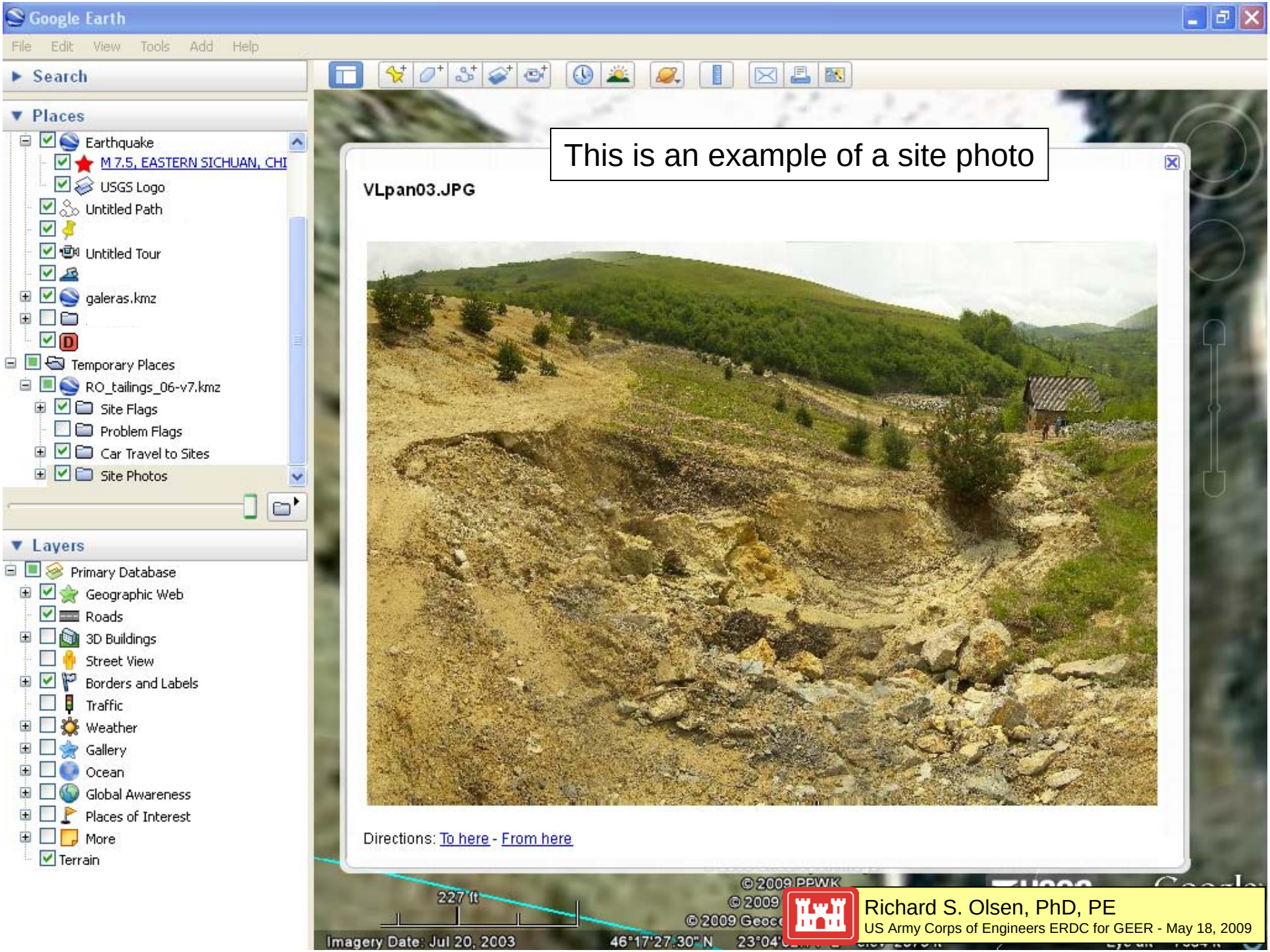
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Geographic Web
Roads
3D Buildings
Street View
Borders and Labels
Traffic
Weather
Gallery
Ocean
Global Awareness
Places of Interest
More
Terrain
This is an example of a site photo
VLpan03.JPG
Directions: To here - From here
227 ft
Imagery Date: Jul 20, 2003
46°17'27.30" N
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Google Earth icons related to earthquake damage

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Selection and organization of field equipment during reconnaissance efforts

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Inside the Walking Bag

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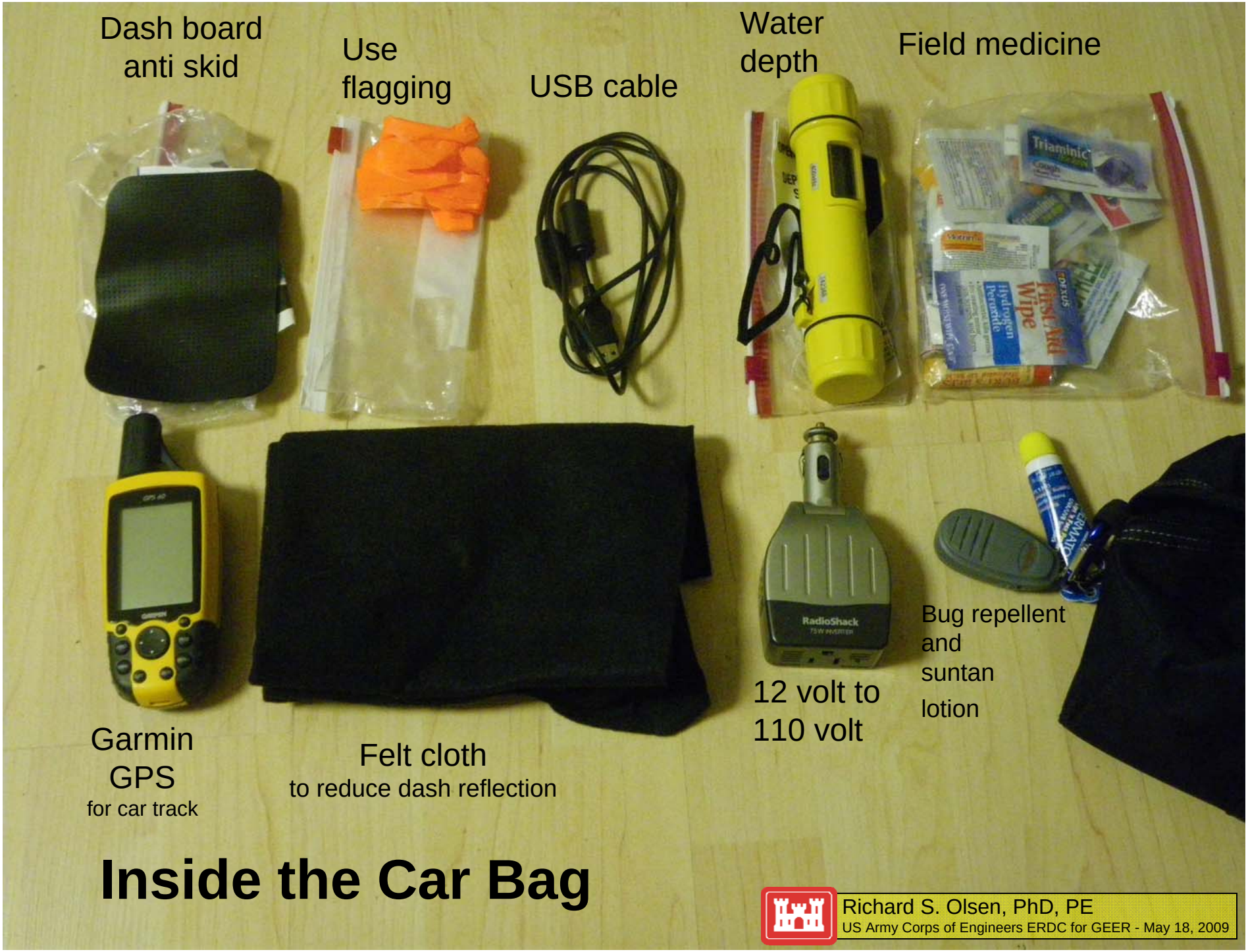

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Inside the computer bag 1

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Field back pack having open net cloth

Walking stick (and camera mono pod)

Hat with pocket inside hood for GPS

Field Items

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Single Battery Bag

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Blackberry

(The group leaders and SMEs must have blackberries)

With installed software for field use
- Google maps
- weather web links
- NexRad web links
- 411 web link
- social networking software/links

Pre-establish contact lists and have methods for contact information exchange.

Have international unlimited data option set before deployment

Users must have experience using the Blackberry

Have contacts for all field POCs, office POCs, support groups (i.e. motel, food, transportation, communications), medical POCs, other agencies, other groups…

Belt holder

Use an old blackberry as a battery charger (and backup list of contacts)

Extra SIM in case blackberry Is lose or broken (required for some agencies)

Wired (and/or bluetooth) ear phone

Blackberry items

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I'm standing on a failed bridge in Taiwan caused by the 1999 Chi Chi earthquake (the waterfall was also generated by the fault displacement)

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