SMAP Field Campaigns Discussion

Tom Jackson (USDA)

May 3-4, 2011

SMAPVEX12

- Overall field experiment plan (context)
  - ComRAD Tower System
- Aircraft options
  - CARVE/PALS
  - UAVSAR
  - Australia, Canada, and other systems
  - AirMOSS
- Site options
- When
- Basic design and logistics

SMAP Field Campaign Plans

- FY11
  - ComRAD: Tests at BARC
  - CARVE/PALS
    - Transits: Reynolds Creek on return flight
    - Alaska: Potential use of CARVE data collected
    - Oklahoma: ISST and LW (only if scan mode is operational)
- FY12
  - ComRAD: Crop growing season at BARC
  - SMAPVEX12
    - Impacts of CARVE and alternatives
- FY13
  - CanEx-FT
  - ComRAD: Available if supported
  - CARVE related campaign
- FY14
  - ComRAD: Available if supported
  - CARVE related campaign
- FY15
  - SMAPVEX15
    - Impacts of CARVE and alternatives

SMAP Instrument Simulator Options

System	Contact	Platform	Configuration
ComRAD	Peggy O'Neill (GSFC) /R. Lang	Tower	Active and Passive
PALS	Steve Dinardo (JPL)	Aircraft	Active and Passive
PLMR/PLIS	Jeff Walker (Australia)	Aircraft	Active and Passive
UAVSAR	Scott Hensley (JPL)	Aircraft	Active
EC L-Band	Anne Walker (Canada)	Aircraft	Passive

SMAPVEX12

- Overall field experiment plan (context)
  - ComRAD Tower System
- Aircraft options
  - CARVE/PALS
  - UAVSAR
  - Australia, Canada, and other systems
  - AirMOSS
- Site options
- When
- Basic design and logistics

CARVE

- Description of program objectives
- Experiment design
  - Timeline
  - Aircraft/instrument configuration
  - Flight lines
- Potential use and availability of CARVE data to SMAP
- CARVE add-ons (Transits, flights in AK, ISST)
- PALS Scanning Status and Plan
- 2012 and 2015 conflicts

How Much Does a Field Experiment Cost (During Carve)?

- Assume all salaries are covered by other programs.
- Aircraft mapping of a 36 km by 36 km area with PALS in scan mode (6 hours @ 1K/hour=6K/day + MSC 1K/day) =7K/day (cost is ~1K/day with no flight).
- Ground sampling 40 fields by 20 people. Per diem/person =120/day=2.4K/day+10 cars @ 0.06/day=0.6/day) Total=3K/day.
- Aircraft integration (25K) and transit cost (50K) (Assumes this will be during CARVE/AK).
- Travel for ground team at 0.5K each=10K
- Equipment=10K
- Total cost for 10 flights over 20 days= 235K + contingency
  - 10*6+20*1+20*3+75+10+10=235K
- Based from Grand Junction, CO= 200K + contingency

SMAPVEX12: Site Options

- Little Washita, OK
- Walnut Gulch, AZ
- Iowa TBD (Would this be ready?)
- Little River, GA
- Kenaston, SK
- Other


CARVE
Umiujaq
BERMS
Kenaston
Ontario
RC
Iowa TBD
Indiana TBD
Grand Junction
LW
LR
WG
© 2011 Europa Technologies
© 2011 MapLink/Tele Atlas
US Dept of State Geographer
© 2011 Google
Mexico
lat 43.086921° lon -95.219052° elev 347 m

When? CARVE Schedule and SMAP

4.3. Schedule

The CARVE schedule (Figure 4-2) covers all phases of the investigation.

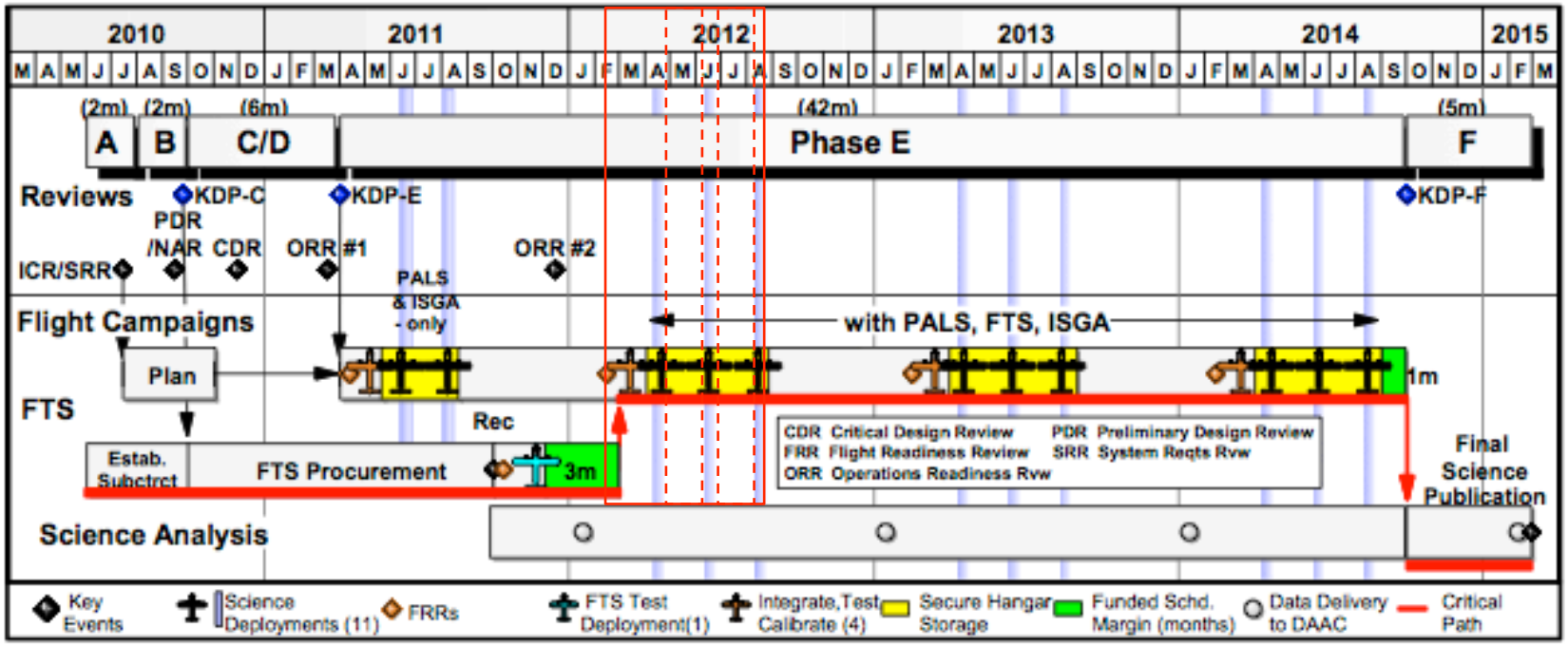


Figure 4-2. CARVE Top-Level Investigation Schedule

Approximate Time Periods Available for SMAP

- April 27 - June 6
- June 27 - August 8
- August 21 – Feb. 15

When? Time Periods Available for SMAPVEX12

- April 27 - June 6 (Misses part of winter wheat green up)
- June 27 - August 8 (Misses early corn growth and later stages of soybeans)
- August 21 – Feb. 15

SMAPVEX12: Scheduling Example

- Swap CARVE PALS installation to SMAP PALS installation (2 – 3 days)
- Transit Fairbanks to OKC (3000 miles at 150 mph~20 hours~3 days)+1 day rest+1 day checks
- 22 – 25 day deployment at OK
- Schedule based on generic satellite overpass frequency

June 26	27	28	29	30	July 1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	Aug. 1	2	3	4	5	6

Installation
Transit
Available Flight Day
Scheduled Flight Day

SMAPVEX12

- Overall field experiment plan (context)
  - ComRAD Tower System
- Aircraft options
  - CARVE/PALS
  - UAVSAR
  - Australia, Canada, and other systems
  - AirMOSS
- Site options
- When
- Basic design and logistics

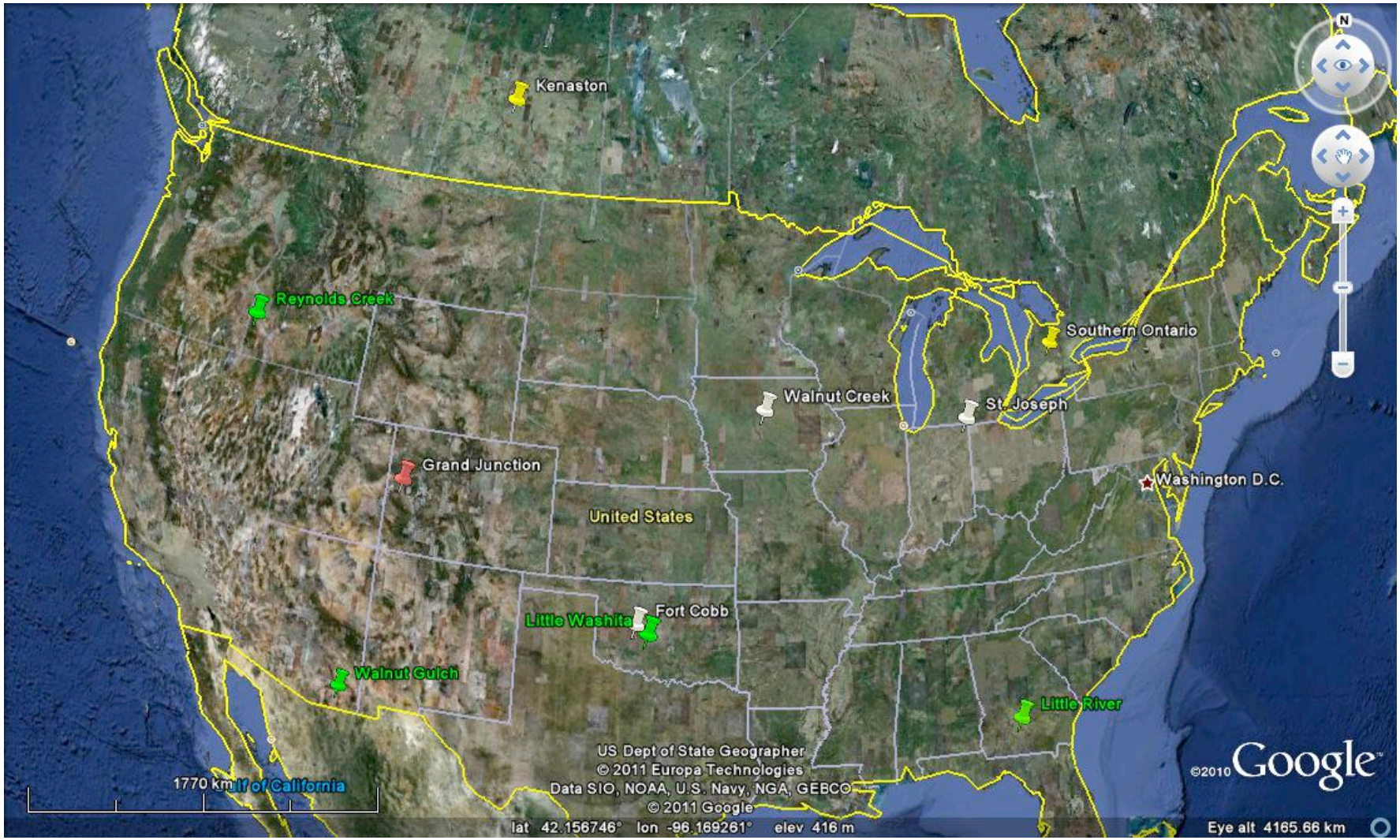
SMAPVEX12

- Some basic options and considerations
  - One or more locations?
    - Spring wheat in Midwest
    - Summer crops in Midwest
    - Late summer monsoon in Arizona
    - GPM sites (Arizona, Oklahoma?, Iowa?)
  - One or more time periods?
  - Constraints imposed if we use PALS
  - Dress rehearsal?
  - Budget constraints?

FY-13 CanEx-FT

- Objectives
  - SMAP: Algorithm or rehearsal?
  - CSA: Stephane's presentation
- Constraints/Logistics
  - FY13 (Funding and planning)
  - Canadian location
    - CSA collaboration
    - Compatible with FT product
  - Aircraft simulator
    - Considering CARVE and the fact that the FT algorithms only require radar data, the UAVSAR is the best choice
      - EC L-band Radiometer will support broader science objectives

Backup


Kenaston
Reynolds Creek
Southern Ontario
Walnut Creek
St. Joseph
Grand Junction
Washington D.C.
United States
Fort Cobb
Little Washita
Walnut Gulch
Little River
1770 km
Gulf of California
US Dept of State Geographer
© 2011 Europa Technologies
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2011 Google
©2010 Google
lat 42.156746° lon -96.169261° elev 416 m
Eye alt 4165.66 km

SMAPVEX15 Concept A