



Roles and Partnership Opportunities

--

Commercial Sector Contributions

2018 Space Weather Enterprise Forum
Washington, DC
July 25, 2018

Conrad C Lautenbacher, Jr
CEO, GeoOptics, Inc



Agenda

- Space Weather Developments
- International and National Situation
- Organizational Components
 - Government
 - Commercial
 - Academic
- Commercial Contributions
 - American Commercial Space Weather Association
 - Specific capabilities



International

UN/US Workshop **International Space Weather Initiative:** **The Decade after the International Heliophysical Year 2007**

BOSTON COLLEGE, CHESTNUT HILL, MA 31 JULY - 4 AUGUST, 2017

Marks tenth anniversary International Heliophysical Year,
which led to International Space Weather Initiative (ISWI).

Focus on recent scientific research advances by:

- Using ISWI instrument data
- With space mission data
- Adding significant new knowledge on
Space weather phenomena
- In near Earth and interplanetary space.

Absence of commercial sector participation



Space Weather Developments

Commercial Sector Reactions

- Space Weather as a Global Challenge
 - International forum hosted by Embassy of Japan
 - Recognized global importance of space weather
 - **Commercial sector contributions recognized**
- National Space Weather Partnership (NSWP)
 - SWORM Subcommittee under NSTC
 - Established by OFCM -- **community wide public forum**
- Pending Space Weather Legislation
 - Passed in Senate
 - House hearing held – private sector included
 - Currently **weak in commercial sector inclusion**



U.S. National Space Weather Strategy*

Introduction

- “The Strategy and Action Plan aiming to foster a **collaborative environment** in which **government, industry,** and the **American people** can better understand and prepare for the effects of space weather.” *
 - “The Nation must continue to **leverage existing public and private network of expertise and capabilities** ... to improve the ability to manage risks associated with space weather.” *
-
- That means: **include the commercial sector in planning and executing specific viable goals for services and products.**



*https://www.whitehouse.gov/sites/default/files/microsites/ostp/final_nationalspaceweatherstrategy_20151028.pdf

Commercial Space Weather Industry

Products and Services

Value Chain

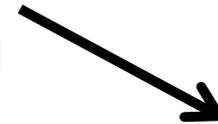
Upstream

- Research
- Observations
- Instrumentation
- Data



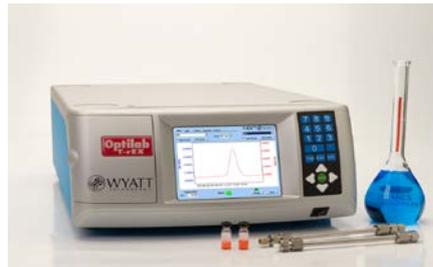
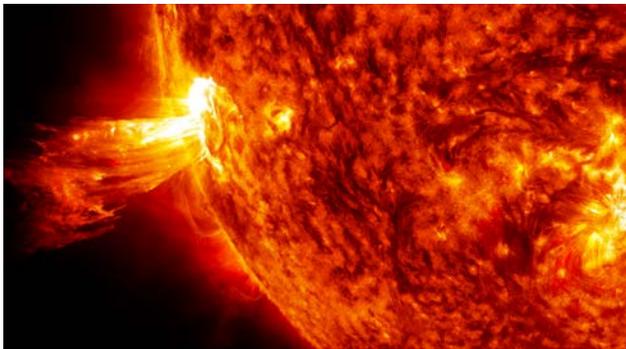
Mid-Stream

- Data Processing
- Computation
- Algorithms
- Models



Downstream

- Forecasts
- Warnings
- Services
- Emergency Mgt



American
Commercial Space
Weather Association

The Space Weather Enterprise

Products and Services

Maximizing Value



Analogy:
“Weather
Enterprise”

Government

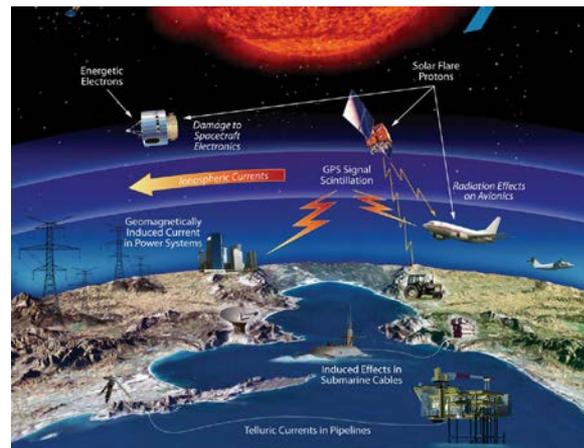
- **Public Safety**
- Economic Health
- National Defense
- **Regulation**

Academia

- Science
- **Research**

Commercial

- Services
- **Efficiency**
- Competition
- **Robust Economy**
- Communication



Enterprise Efficiency

Which system architecture is the most efficient?

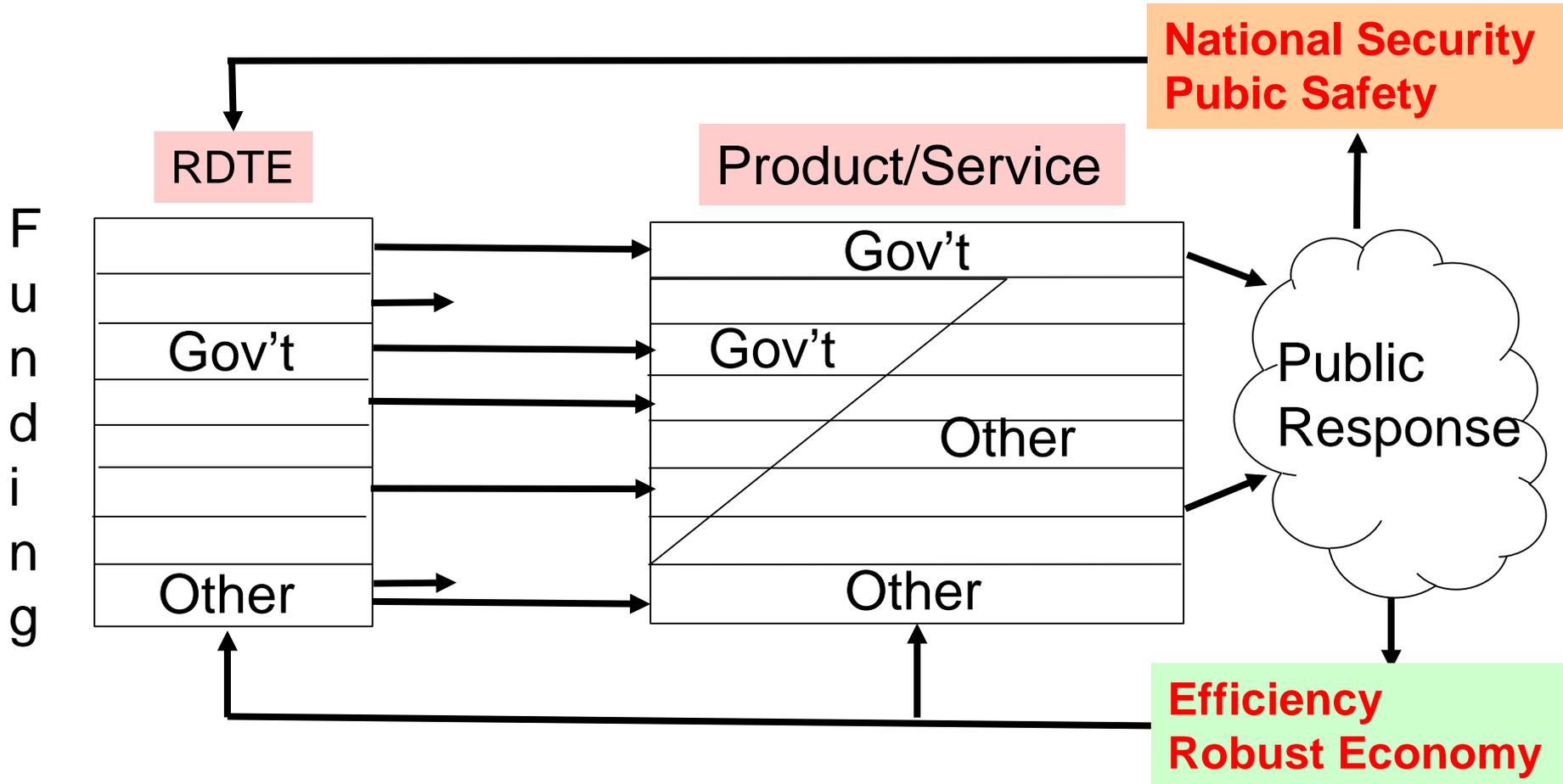
Swim Lanes?



Free for All?



“Swim Lanes” for National Needs



Other = NGO, Free Enterprise



Commercial Space Contributions

Examples

- Power Grid Outages*
 - Storm Severity Index “Dst”
 - Commercially developed for USAF
 - Now publically available and in use
- Radiation in Air Travel*
 - ARMAS** Program
 - Started by commercial company
 - Measures radiation dose
- Ionospheric Scintillation*
 - Event during Katrina wiped out HF radio
 - Companies w/Utah State -- free 24 hr global forecasts

*Courtesy of W. Kent Tobiska **Automated Radiation Measurements for Aerospace Safety





American Commercial Space Weather Association

***Linking Scientific Understanding
with Operational Priorities***

The End

