National Aeronautics and Space Administration

NASA Earth Science and Applications

Teresa Fryberger, NASA HQ

NASA

NASA continues the objectives for space exploration established in the National Aeronautics and Space Act of 1958:

To pioneer the future in space exploration, Scientific discovery, and aeronautics research.

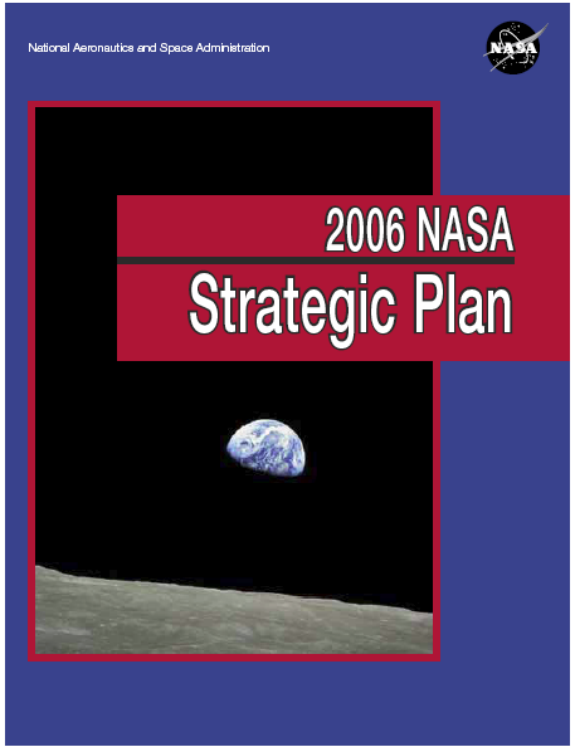
NASA Science Goals:

1. ***Study Earth from space to advance scientific understanding and meet societal needs. (Earth Science)***

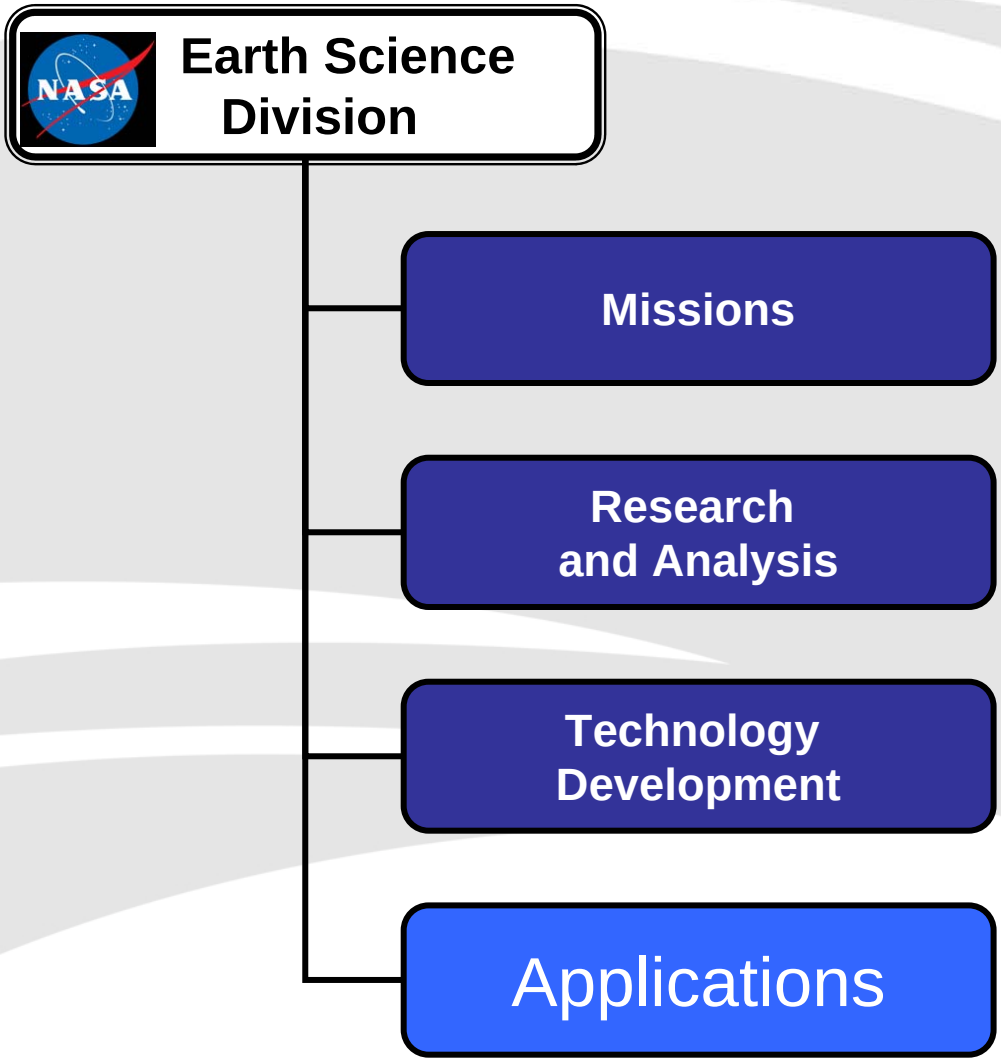
2. Understand the Sun and its effects on Earth and the solar system. (Heliophysics)

3. Advance scientific knowledge of the origin and history of the solar system, the potential for life elsewhere, and the hazards and resources present as humans explore space. (Planetary Science)

4. Discover the origin, structure, evolution, and destiny of the universe, and search for Earth-like planets. (Astrophysics)



NASA Earth Sciences

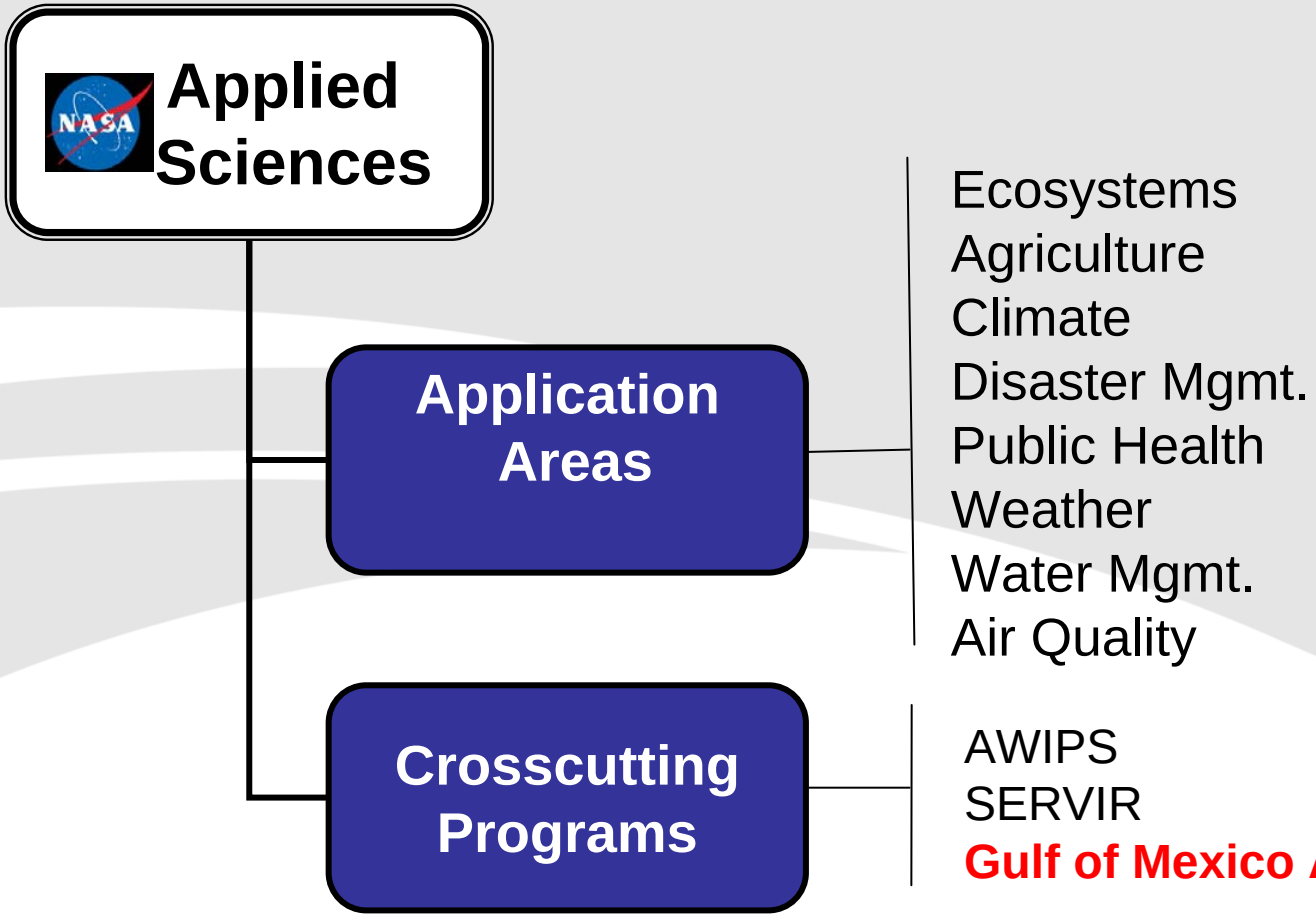


Earth Science goal: to advance Earth System science, including climate studies, through space borne data acquisition, research and analysis, and predictive modeling

NASA On-Orbit Research Missions

Earth Science Applications

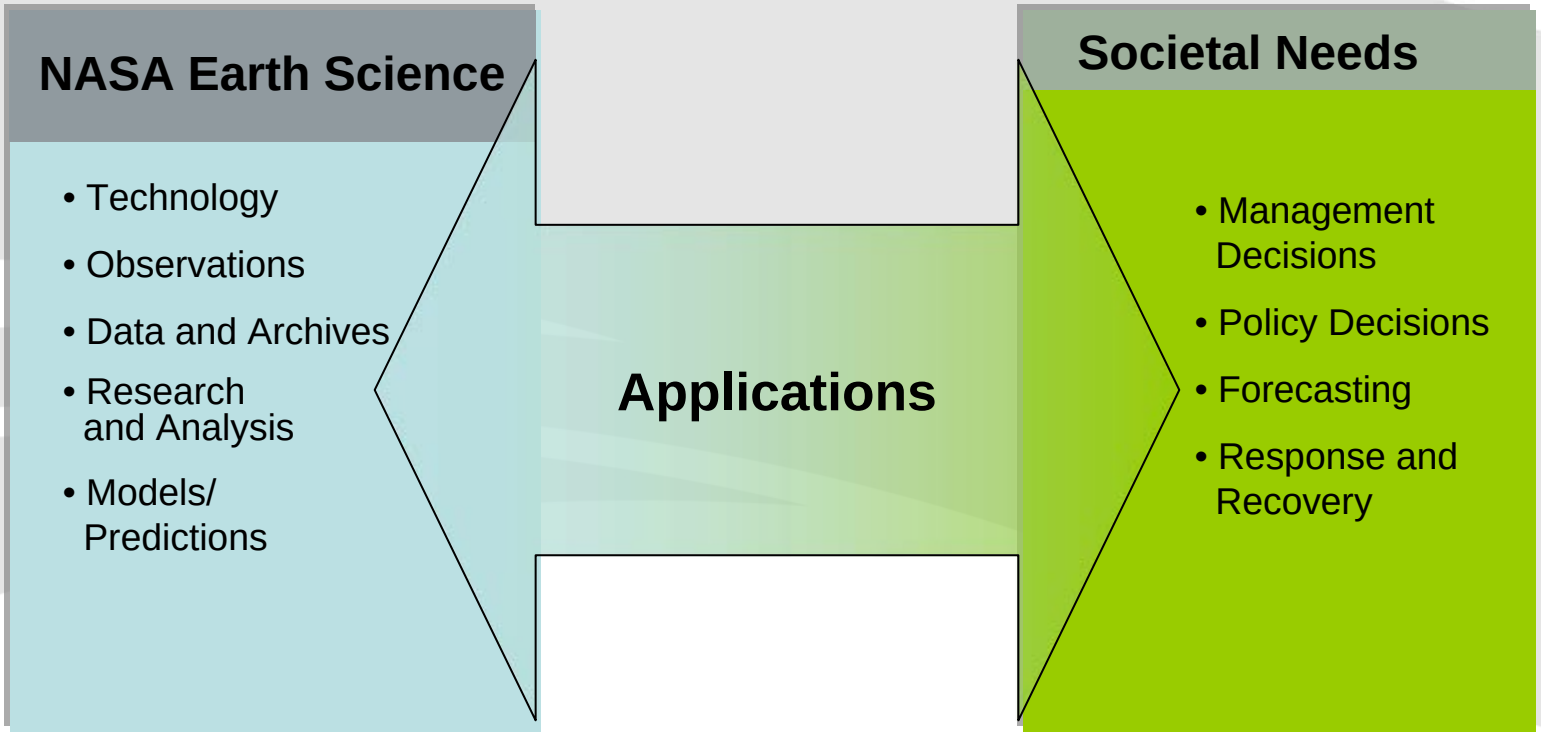
GOAL: Discover, expand, and accelerate the realization of societal and economic benefits from NASA Earth observations, science and technology.



NASA Earth Science Applications

FOCUS *on those areas where NASA can have greatest impact:*

- *NASA capability and expertise*
- *Demonstrated societal need*
- *Receptivity to application—strength of partnerships*

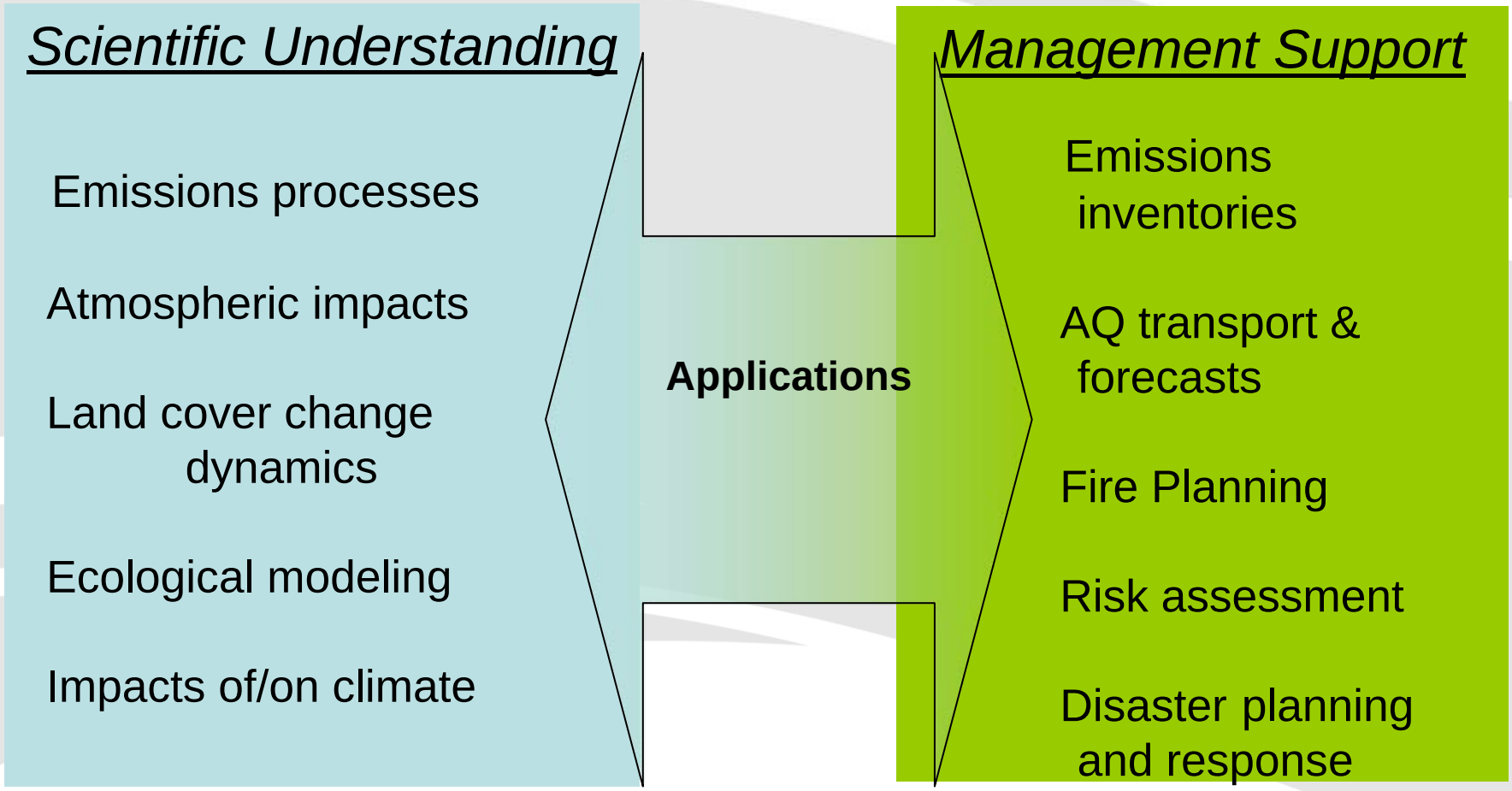


NASA Applied Sciences: Current Status

Applied Sciences currently manages **111** competitively selected projects:

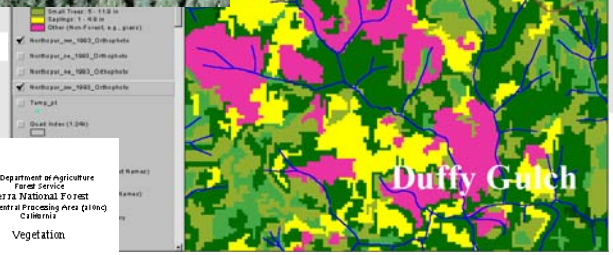
- In 31 states
- Federal Partners: 7 USDA agencies, 6 NOAA branches, 4 DOI Agencies, DOE, DOT (FAA), USAID, NRL, DHS, CDC, EPA, Coast Guard
- Other Partners: e.g. Gulf of Mexico Alliance, Western Governors Association, CATHALAC, ….

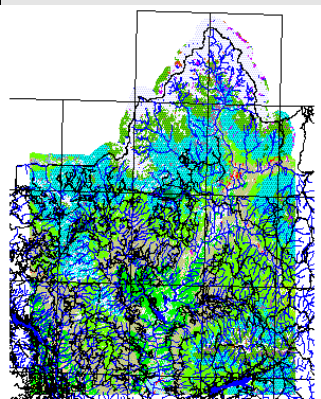
An Example: NASA Earth Science & Fires



NASA & USFS: Over 30 Years of Collaboration

Collaborative Use of Landsat Data For Timber Inventory / Health (early late 1970's – 1990's)





Improvements in Airborne Observations of Wildfire Events (1990's – present)

MODIS Fire Detection Rapid Response System (RSS)

June 24th, 2008 Debrief: Fires in California: NASA Support

June 21st & 22nd:
CA lightening storms, triple-digit temperatures spawn a few hundred fires.
CalFire calls NASA-Ames WRAP staff at 3:00 AM requesting Ikhana and sensor support (six weeks prior to WRAP team's planned fire missions).

June 23 AM (Mon):
Over 300 of the nations 516 fires were in NoCA. CalFire calls WRAP team PI at 3:00 AM requesting support. NIP increases number to 500 fires in California in PM.

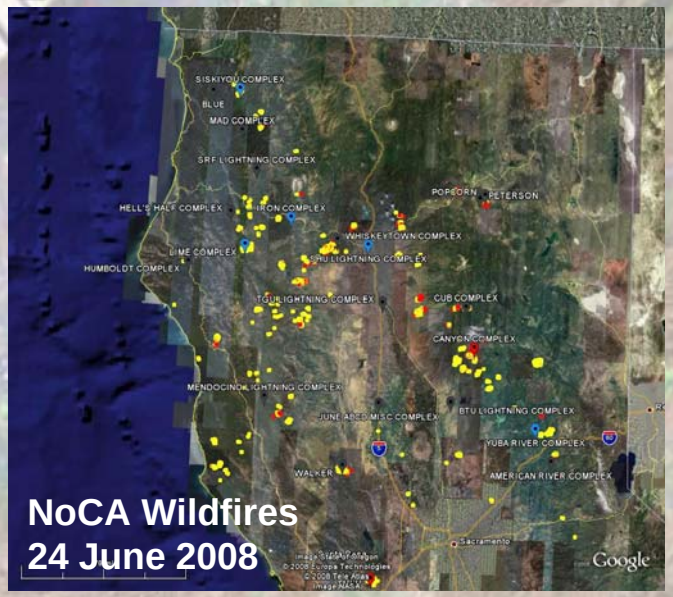
June 24 (Tues):
National Incident Report: 312 new fires nationwide with 121 new fires in CA. Northern California: 565 fires; Southern California: 23fires; Total: 588 state-wide. These fires were grouped into 32 separate Major Fire Complexes. Some fires have grown by over 6000 acres in a 24-hour period!!

June 24th 9:00 AM
NASA-ARC, NASA-DFRC, NASA-HQ and CalFire telecon: agree to accelerate mission series. Schedule plan drafted to "ready" all systems by 30 June. DFRC engages FAA for emergency "amendment" to COA start. Mission start-up by mid-week 30 June.

Multi-day "severe fire weather" event expected in NoCA on 26 June (Thurs), lasting through the weekend, drives need for critical missions ASAP.

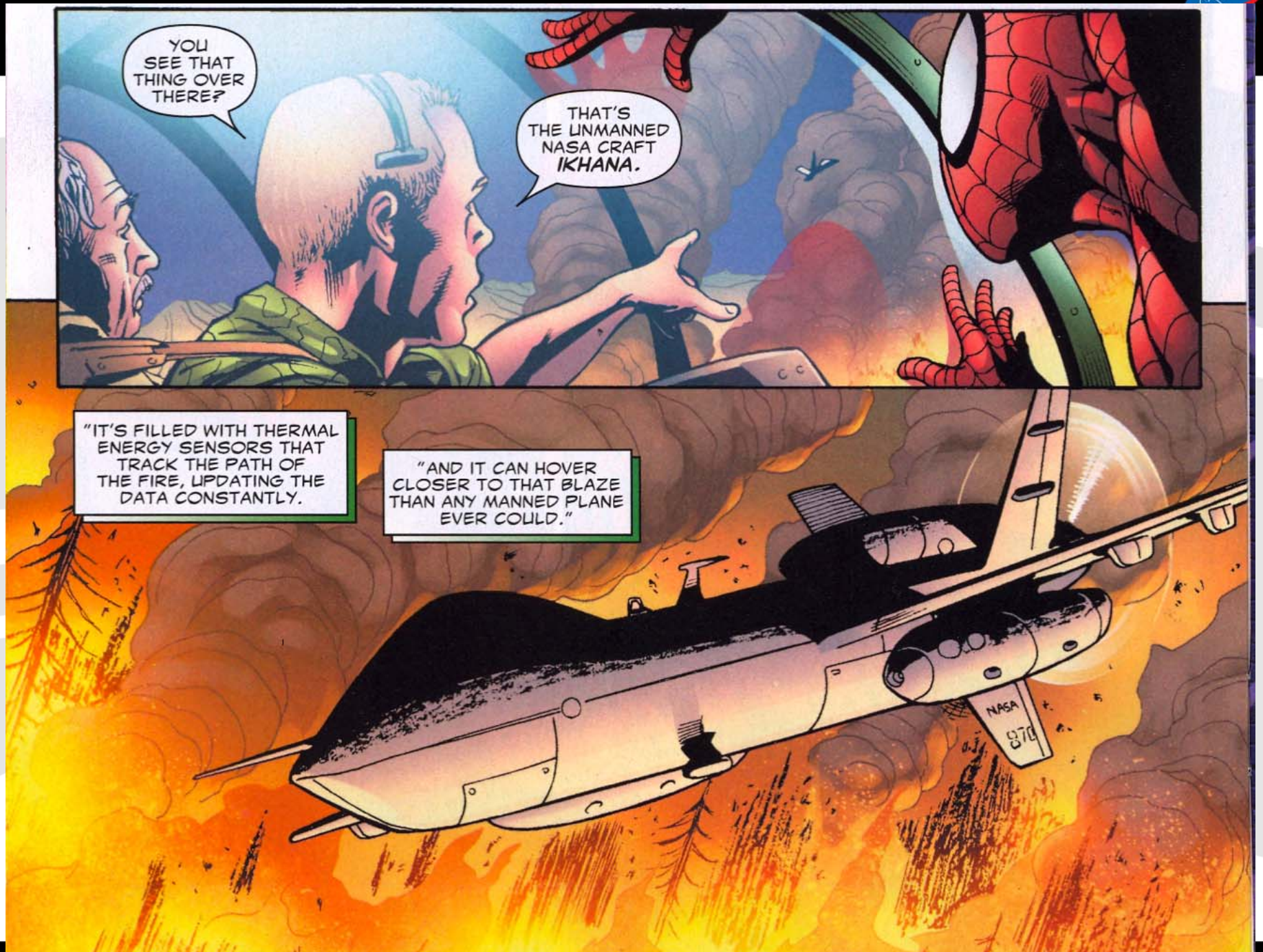
WRAP team anticipates 1-3 missions through 7/12. Missions anticipated to be 8-10 hours duration.

California Wildfires
24 June 2008



NoCA Wildfires
24 June 2008


MARVEL
6 .com
AMERICA
SUPPORTS
YOU
THE NEW
AVENGERS
FIRELINE


YOU SEE THAT THING OVER THERE?
THAT'S THE UNMANNED NASA CRAFT IKHANA.
"IT'S FILLED WITH THERMAL ENERGY SENSORS THAT TRACK THE PATH OF THE FIRE, UPDATING THE DATA CONSTANTLY.
"AND IT CAN HOVER CLOSER TO THAT BLAZE THAN ANY MANNED PLANE EVER COULD."
NASA

Applied Sciences Gulf of Mexico Initiative

➢In 2007 Stennis Space Center, together with HQ, developed a plan for an initiative that focuses on needs in the Gulf Region that can be addressed by NASA research results and satellite observations.

- Guided by the priorities of the ***Gulf of Mexico Alliance***
- Leverages and collaborates with other expertise in the region: NRL, NOAA, EPA, USGS, Universities

ROSES 2008 Amendment A.28: "Earth Science for Decision Making: Gulf of Mexico Region"

… to enhance the Gulf of Mexico region's ability to recover from the devastating hurricanes of 2005 and to plan for a sustainable and prosperous future through the use of NASA Earth science observations and research.

Total Amount of Funding	$8M total
Anticipated Number of Awards	10 – 25 projects
Expected Range of Award per project	$150K - $400K total *
Period of Performance	up to 24 months
Expected Project Start Date	circa January 1, 2009

*These figures are total funding for the entire project; the figures are not *per annum*. NASA will distribute *all funds* at the beginning of the project. The project teams have up to 24 months to complete the project.

NASA Earth Science
SERVING SOCIETY