The PACE Applications Program

Pursuing impactful and societally-relevant PACE science

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"The equally brilliant and novel advance here is synthesizing that knowledge and applying it in an entirely different way that's simple and effective."

- Heather Tallis

Big Picture

- **Who are we?** *PACE Applications Program!*
- **Why should you care?** *Applied science, science communication, and achieving greater impact!*
- **What can you take away from this?** *A model and a few ideas!*
- **Practice**! Breakout activity to communicate the impact of your science.

PACE Applications Program

PACE Applications Plan

PACE

Ver. 1.2

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Goddard Space Flight Center
Greenbelt, Maryland

- *Address community user needs* & concerns with PACE data products
  - *Grow relevance* & sustainability of PACE
    - *Demonstrate the societal value* & utility of PACE

The goal of the PACE Applications Program is to foster new partnerships and out-of-the-box thinking that will generate inventive solutions that aid society.

Terminology:

- **Applications** are innovative uses of NASA PACE data products to complement and improve *decision-making activities and provide practical solutions to meet societal needs.*

- **Applied Research** provides *fundamental knowledge* of how PACE data products may be scaled & integrated into *users'* policy, business, and management activities to improve decision-making.

- **End-user communities or stakeholders** include
  - Individuals & groups
  - Public & private sectors
  - National & international organizations
  - Local & global scales

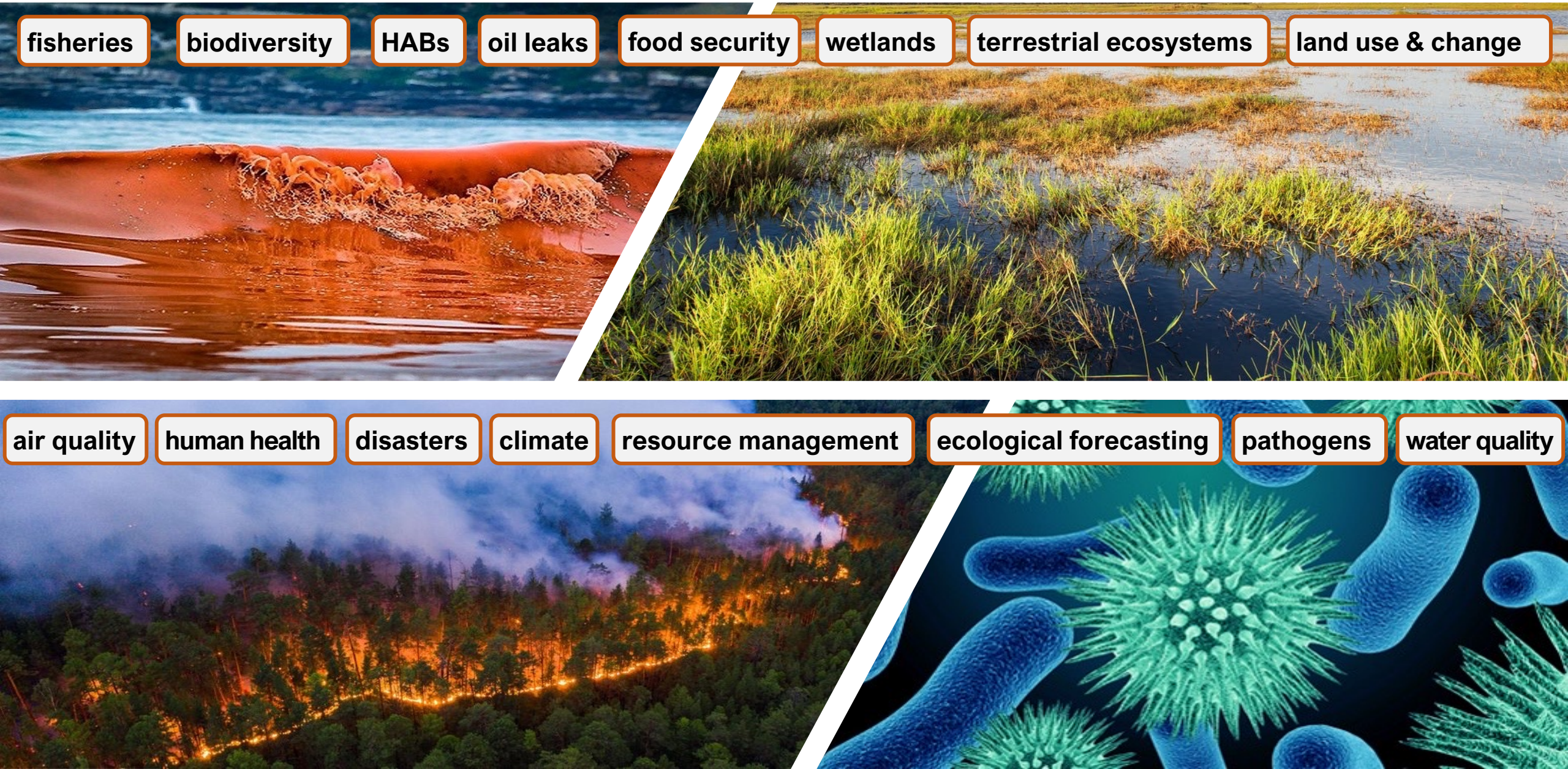
Other Important PACE Applications Definitions:

- **Accessible** data is approachable, free of charge, understandable, with unrestricted access, and in machine-readable formats.

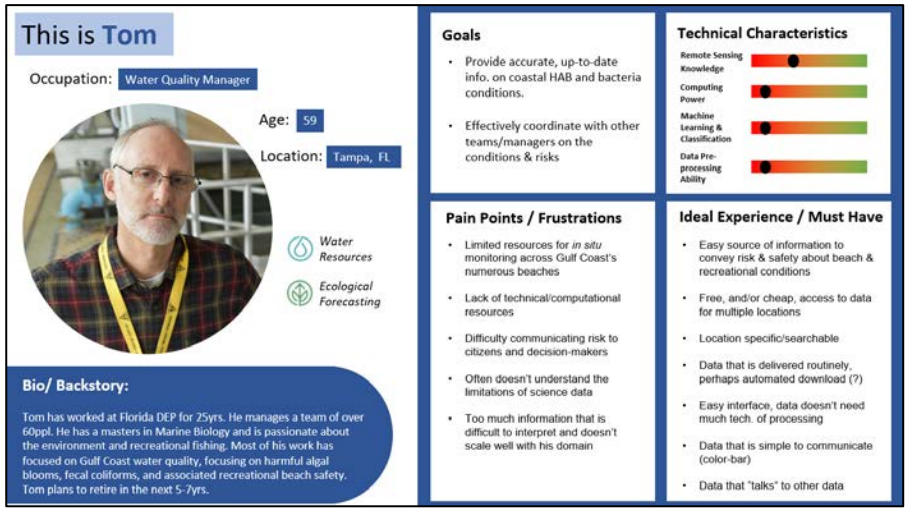
- **Useable** data are delivered in form that meets the needs of different user audiences, is ready for the tasks that the user needs to accomplish, and that has been adapted to the user needs.

- **Actionable** data is info. that can be acted upon or that gives enough insight into the future that the actions that should be taken become clear for decision makers.

PACE: Interdisciplinary applied science objectives



PACE Applications Events and Activities: Community Focus Sessions, Needs Assessments (using illustrative user personas), Annual Workshops, Newsletter



PACE Terrestrial-land Community Assessment

SurveyMonkey

Q13: What exploratory PACE products might you be interested in? *(Terrestrial Community Survey, 2021; Urquhart, Sadoff et al.)*

Join us for the 2022 PACE Applications Workshop!

Keynote and plenary talks, panels, posters, and discussions on:

- PACE Science,
- PACE Applications,
- Community engagement & co-production,
- Mission synergies,
- Accessible data tools & services.

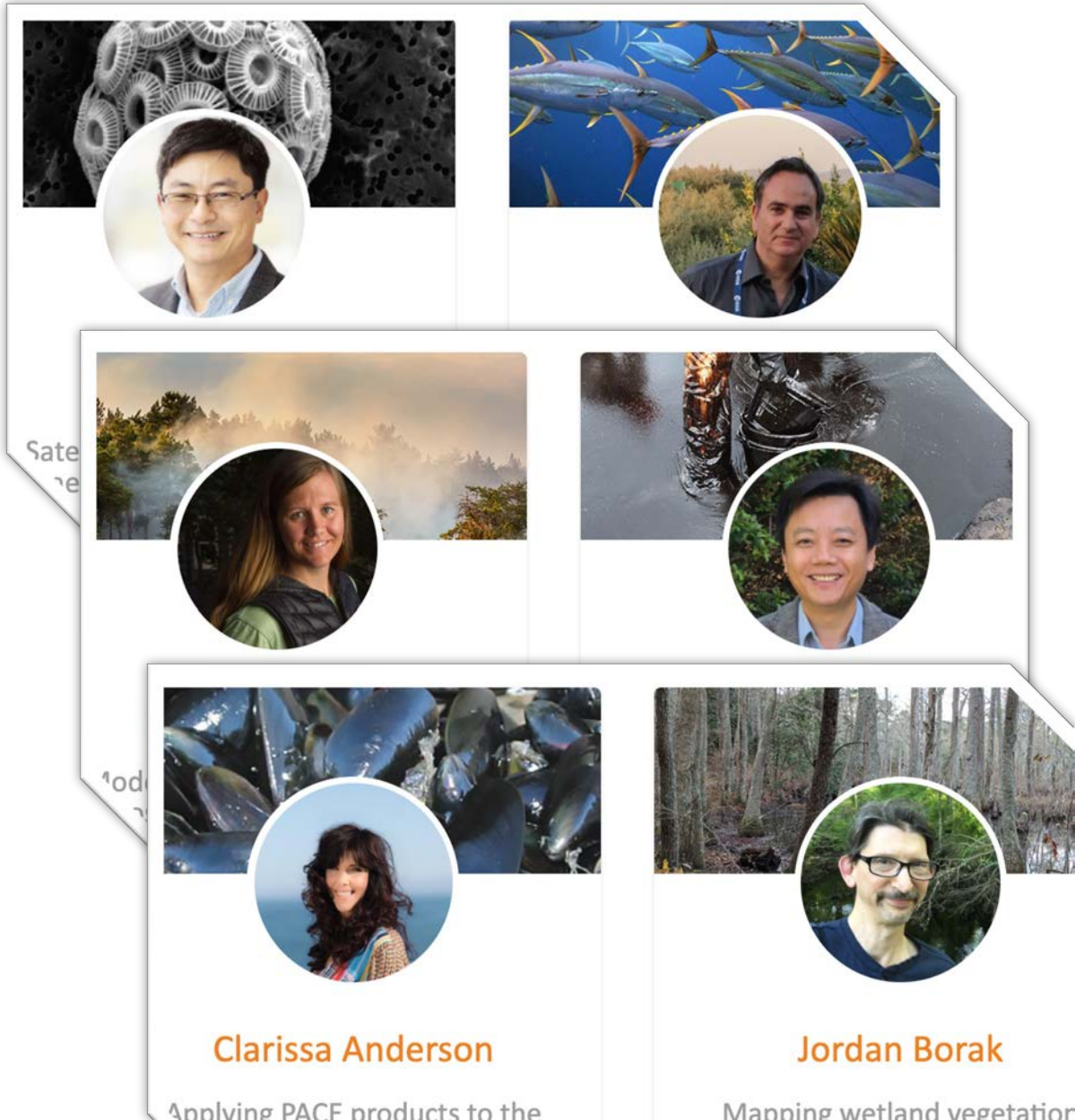
GO REGISTER, GO! https://pace-applicationsworkshop2022.eventbrite.com

PACE Early Adopter Program

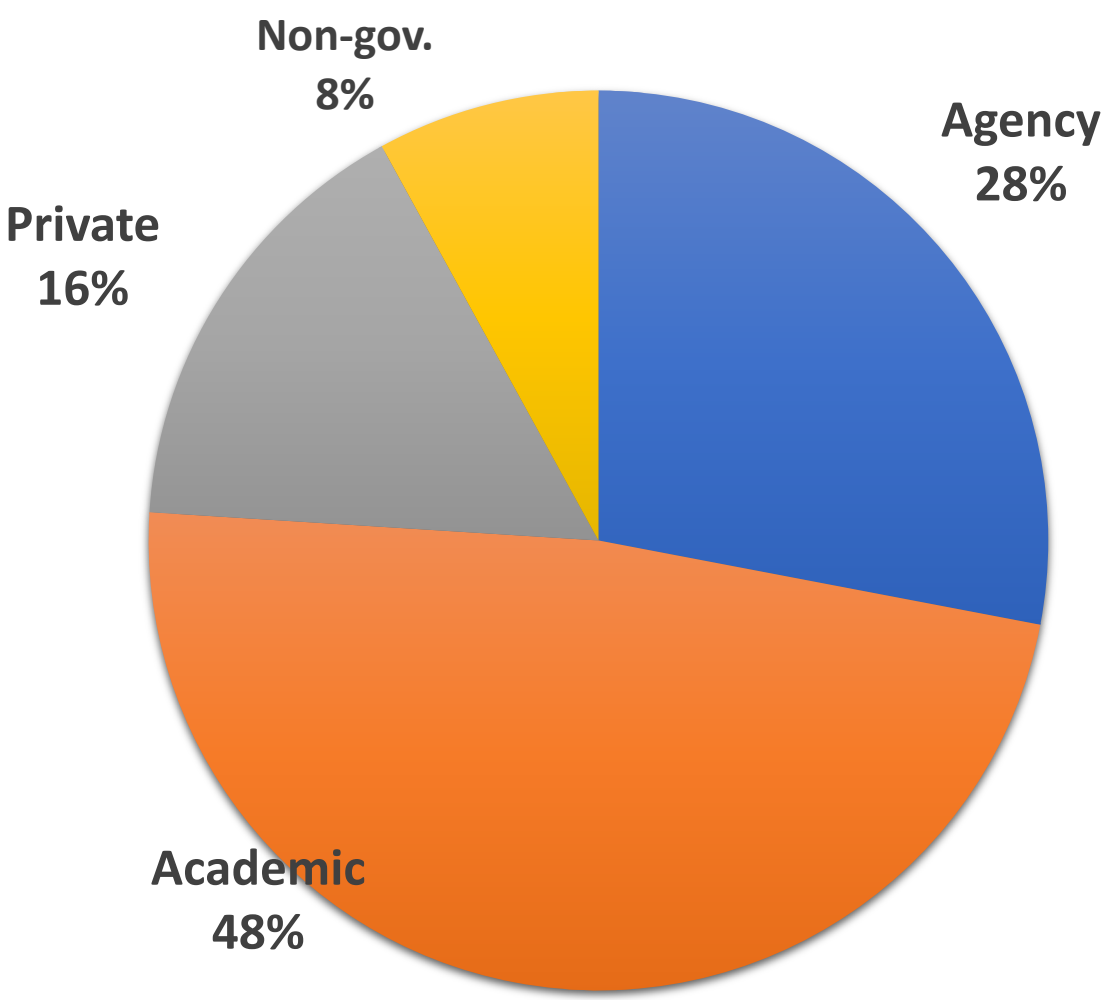
The PACE Early Adopter program promotes applied science and applications research designed to scale and integrate PACE data into policy, business, and management activities that benefit society and inform decision making.

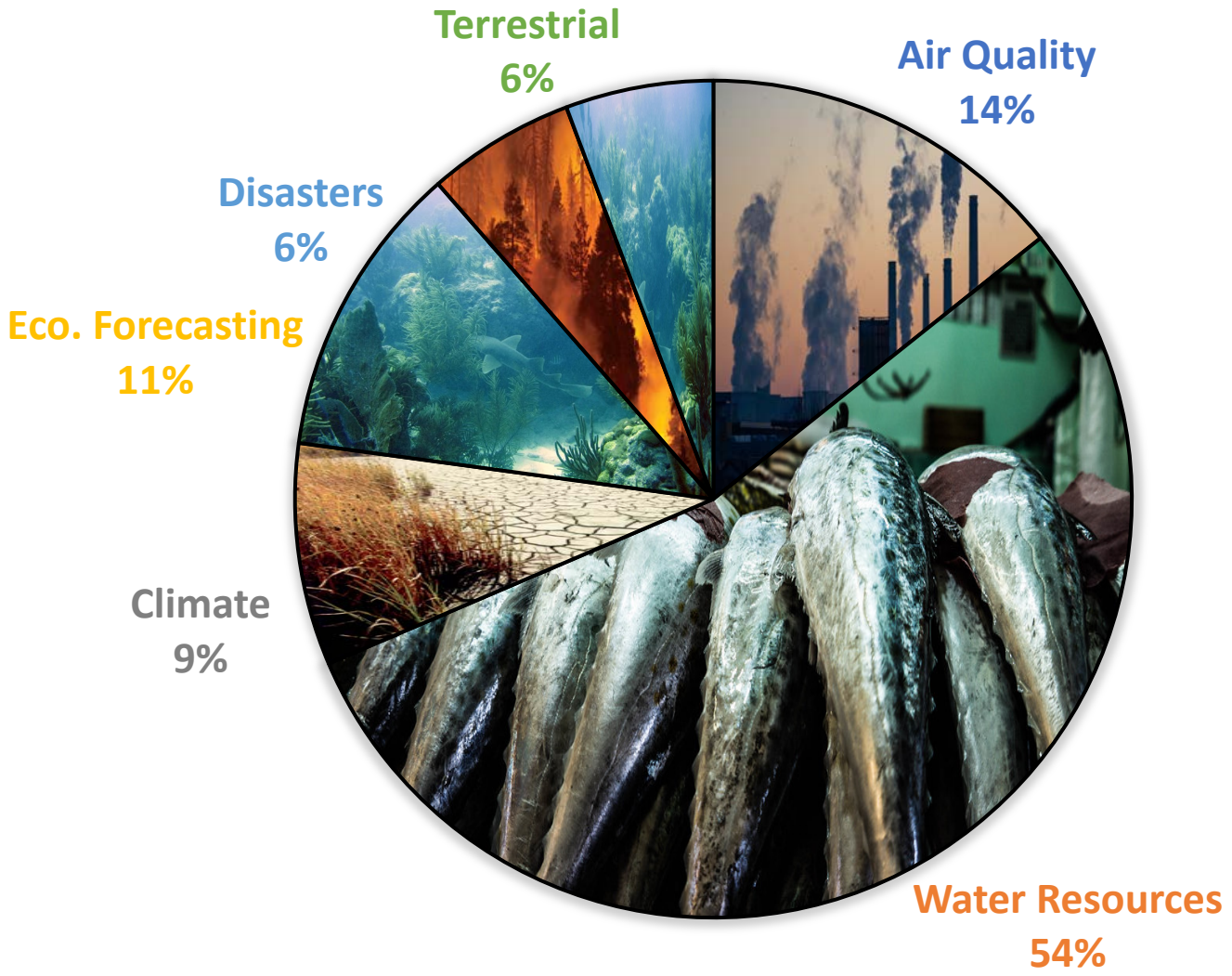
Goals:

- Expand the user communities with tangible and potential applications that would benefit from the use of PACE data
- Facilitate feedback on PACE data products pre-launch
- Accelerate the use and integration of PACE products into applications post-launch by providing specific support to Early Adopters who commit to engage in pre-launch applied research



PACE Early Adopter Program: Sector and Thematic Areas





PACE Early Adopters (n=26)

Plankton, Aerosol, Cloud, ocean Ecosystem

Richard Stumpf

Discriminating algal blooms in turbid coastal, estuarine and large lake environments

Image Credit: W. Volgelbein, VIMS

Application: Use of hyperspectral remote sensing data to separate harmful algal bloom (HAB) types in inland lakes, coastal beaches, and estuarine environments.

Significance: Certain algal species, including cyanobacteria, can produce toxins which pose a significant threat to human health through recreational and drinking water exposure. PACE will support targeted HAB management to advise state managers, local health departments, water treatment plants, and the aquaculture and commercial fishing industries. As these advisories are used to manage fisheries, drinking water operations, and recreational beaches, they provide key information to protect the public and human health from toxic algal bloom events.

How PACE helps: PACE OCI will assist in bloom type separation and estimating physiological state of blooms enabling better estimation of toxicity due to HABs.

Stakeholders: State managers in FL, MD, VA, OH, CA. Health departments, water treatment operators, and aquaculture and commercial fisheries.

https://pace.oceansciences.org/people_ea.htm?id=56

Plankton, Aerosol, Cloud, ocean Ecosystem

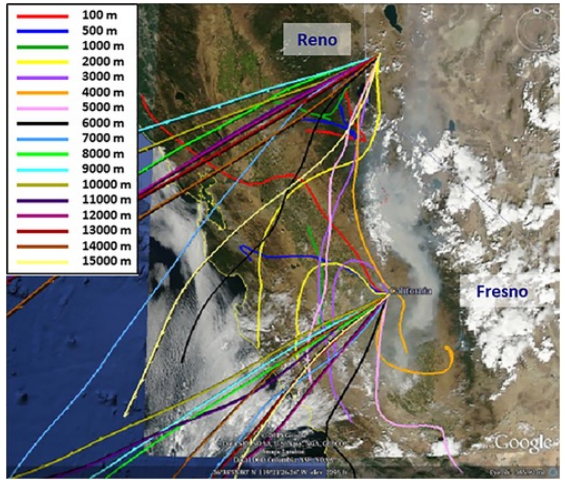
S. Marcela Loría-Salazar

Toward understanding the effect of aerosols on regional weather and human health in the southern Great Plains »

Application: Improved smoke forecasts; Informed health alert forecasts related to pollen, dust, and smoke in the Southern Great Plains

Significance: Aerosol pollution is a growing global public health problem due to wildfires in the US, which especially affects vulnerable human populations. PACE aerosol data will help us advance air quality models to better inform public health alerts in the SGP region of the United States and additional understanding the role of aerosols in regional weather.

How PACE can help: The use and evaluation of aerosol data from NASA PACE mission will advance smoke air quality models by (1) improving the spatial resolution with respect to MODIS aerosol products, especially for combined AOD-height retrieval, and (2) potentially advancing aerosol characterization from the two-multiangle polarimeters.



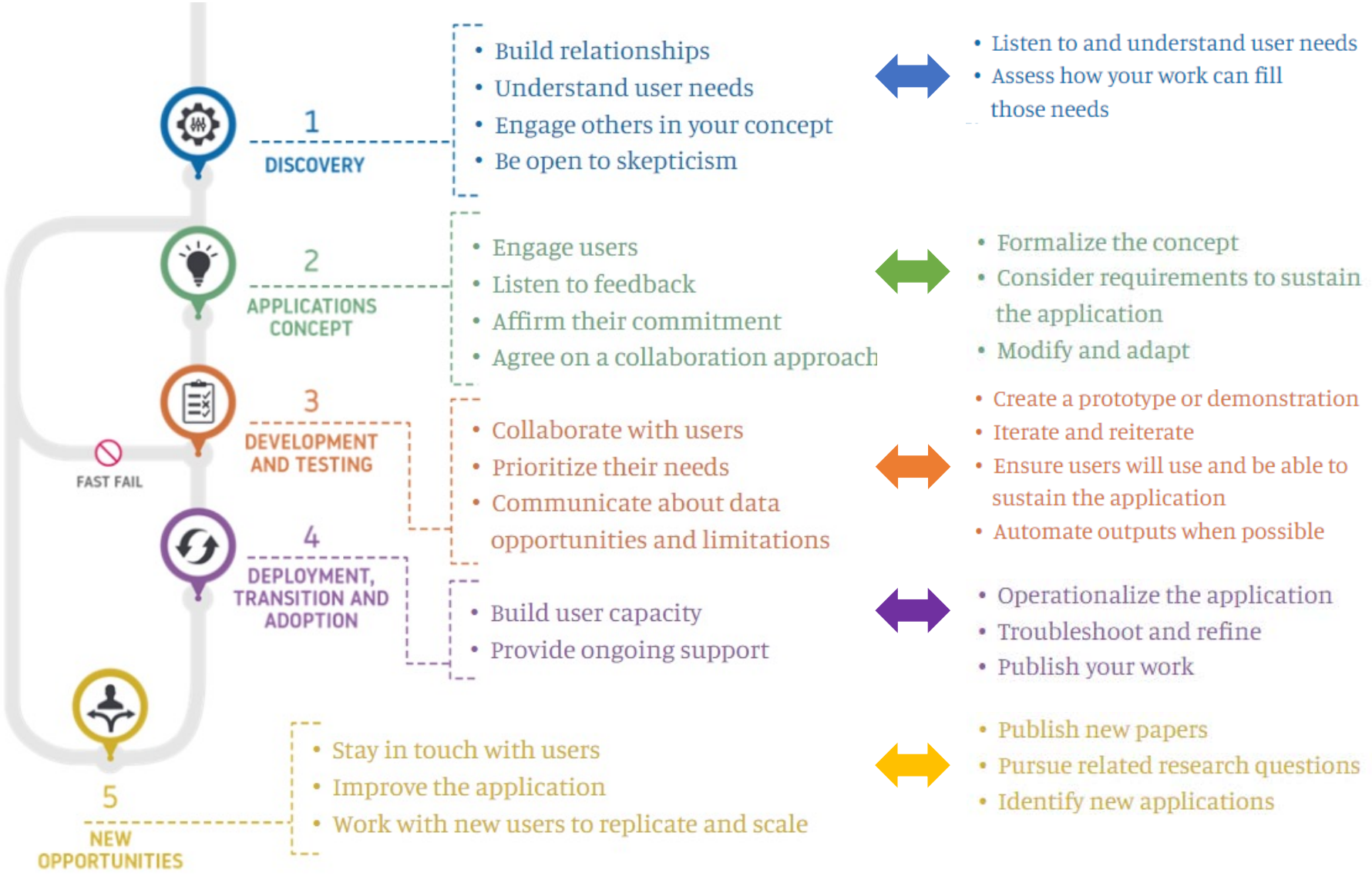
HYSPLIT 24-h back-trajectories (100–15,000 m) from the North American Model (NAM) at 12-km resolution at Fresno, CA, and Reno, NV, on August 31, 2013, superimposed onto a MODIS Aqua true-color image from NASA World View. MODIS, MODerate Resolution Imaging Spectroradiometer.

Stakeholders: Oklahoma MESONET Fire Network; Oklahoma Air Quality Division

https://pace.oceansciences.org/people_ea.htm?id=80

Effective user engagement and co-production = more practical, useful, impactful science

What does this look like in practice?



https://appliedsciences.nasa.gov/guidebook/

NASA Application Readiness Levels

ations

PACE will benefit society by delivering high-quality observations of o tive design and cutting-edge technology are designed to study the earth in new ways and deliver

A key activity is the PACE Applications Program, which engages individuals and groups to use PACE data for their projects. We work with you — scientists, policy makers, public health practitioners, and industry professionals — to apply PACE data to practical societal needs. The goal of the PACE Applications Program is to foster new partnerships and out-of-the-box thinking that will generate inventive solutions that aid society. These efforts support the NASA Applied Sciences Program.

We will strive to effectively transition individuals and groups from being potential users to those who actively employ PACE observations to address environmental issues. Individuals or organizations in both communities can be public or private, federal or regional entities, with local, national, or international scopes for their applications. PACE Applications promotes justice, equity, diversity and inclusion, routine outreach and communication, capacity building, implementing and iterating on feedback, as well as the coordination of diverse

Quick Links

Community of Practice ▶
Early Adopters ▶
Get Involved ▶
Applications Team ▶
PACE Community Newsletter (PDF, 4.6MB) ▶
Applications Plan (PDF, 1.8MB) ▶
Applications Capability Matrix ▶

Breakout Activity!

You're each working on amazing things. How do you communicate the IMPACT of your research?

1. Break into groups of 5. Take turns "pitching" the impact/value of your research to an **environmental manager** (*2mins each).*

   Consider:

   - What are the manager's goals?
   - How does your research impact (positively/negatively) their work?
   - How will they "ultimately" apply the output of your research? Directly? Indirectly?

2. Nominate one pitch to share with the class during report-out.

PACE Applications Further Reading

PACE Applications (Community of Practice, Early Adopters, more): *https://pace.oceansciences.org/applications.htm*

PACE Events: *https://pace.oceansciences.org/events.htm*

PACE Early Adopter Program: *https://pace.oceansciences.org/app_adopters.htm*

Other Helpful Resources

NASA Applied Sciences: *https://appliedsciences.nasa.gov/*

NASA Applied Sciences Applications Guidebook: *https://appliedsciences.nasa.gov/guidebook/*

NASA Resources on Communicating Science:
https://www.nasa.gov/centers/hq/library/find/bibliographies/communicating_science

Alan Alda Center for Communicating Science: *https://aldacenter.org/*

NASA Application Readiness Levels: *https://www.nasa.gov/sites/default/files/files/ExpandedARLDefinitions4813.pdf*

How can PACE Applications help you??

Stay in touch!

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