Societal Relevance of NASA Salinity

Annette deCharon (ODYSEA LLC)
Presentation Overview

• SPURS-2 Data Tool
• “Learn More”
• “Highlights”
• Example Communication Materials
• Discussion
SPURS-2 Data Tool

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  - Developed in collaboration with Fred Bingham and Vardis Tsontos to make data access more interactive and intuitive
  - Tool is described by Bingham et al. article in “Oceanography” special issue

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Saildrone

Saildrone is a wind and solar powered, unmanned surface vehicle capable of long distance deployments lasting up to 12 months. The drone is autonomous in that it may be guided remotely from land while being completely wind driven. This novel sampling platform is equipped with a suite of instruments and sensors providing high quality, georeferenced, near real-time, multi-parameter surface ocean and atmospheric observations while transiting at typical speeds of 3-5 knots.

Dataset Access - doi: https://dx.doi.org/10.5067/SPUR2-SDRON
“Learn More”

• Revamping “Education” section
  • The Role of Salt
  • Following the Water Cycle
  • Density and Ocean Circulation
  • More to come...

https://salinity.odyseallc.net/learn-salt.htm
“Highlights”

• Last OSST meeting (Aug 2018)
  • We discussed ways to better highlight the societal relevance of salinity measurements
• New “Highlights” section on website
  • Content is currently targeted at scientists
  • Could be repurposed into communications materials

https://salinity.oceansciences.org/highlights.htm
“Highlights”

- River Plumes, Marginal Seas & Coasts

https://salinity.oceanciences.org/highlights.htm
“Highlights”

• Each topic includes:
  • Rotator at top
  • Description of societal relevance
  • Small interactive “app”
    • In this case, an interactive GoogleMap shows locations of river plumes, marginal seas, and coasts, which link to specific publications

https://salinity.oceansciences.org/highlights01.htm
“Highlights”

• Each topic includes:
  • Rotator at top
  • Description of societal relevance
  • Small interactive “app”
  • Large interactive “app”
    • In this case, a before/after slides showing changes in the Gulf of Mexico and Amazon plumes

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“Highlights”

- Each topic includes:
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  - Image/video slider that tells a “mini” story on the topic

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  • Resources
    • Links to PO.DAAC, NASA articles, etc.

https://salinity.oceansciences.org/highlights01.htm
“Highlights”

• Air-Sea Interactions: Hurricanes

https://salinity.oceanosciences.org/highlights.htm
“Highlights”

• This topic includes:
  • Before/after slides that show how Hurricane Katia changed salinity and temperature based on Grodsky et al. (2012)

https://salinity.oceansciences.org/highlights02.htm
“Highlights”

• This topic includes:
  • Before/after slides that show how Hurricane Katia changed salinity and temperature based on Grodsky et al. (2012)
  • Interactive that compares two years of data from Fournier et al. (2017)
    • Sea surface salinity
    • Sea surface temperature
    • Winds
    • Mixed layer depth
    • Dissolved organic matter

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‘Highlights’

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In-plume: Fresher seawater

Out-of-plume: Saltier seawater

Defined by low salinity, the Amazon/Orinoco plume covers only 60% of the study area.
“Highlights”

- Monitoring Total Alkalinity & Ocean Acidification

[https://salinity.oceansciences.org/highlights.htm](https://salinity.oceansciences.org/highlights.htm)
“Highlights”

• This topic includes:
  • Interactive image that shows how Total Alkalinity changed in various regions
  • Information is revealed on mouseover

https://salinity.oceansciences.org/highlights03.htm
“Highlights”

- Interactive image that shows how Total Alkalinity changed in various regions.
- Information is revealed on mouseover.

https://salinity.oceansciences.org/highlights03.htm
“Highlights”

• Salinity & Soil Moisture: Water Cycle Links

https://salinity.oceansciences.org/highlights.htm
“Highlights”

• This topic includes:
  • Image sequences from Africa and the U.S. showing links between salinity and soil moisture based Li et al. (2016, 2017)

https://salinity.oceansciences.org/highlights04.htm
This topic includes:

- Image sequences from Africa and the U.S. showing links between salinity and soil moisture based Li et al. (2016, 2017) 

[https://salinity.oceansciences.org/highlights04.htm](https://salinity.oceansciences.org/highlights04.htm)
This topic includes:

- Image sequences from Africa and the U.S. showing links between salinity and soil moisture based on Li et al. (2016, 2017) at https://salinity.oceansciences.org/highlights04.htm
Highlights

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https://salinity.oceansciences.org/highlights04.htm
Example Communication Materials

• Trifold brochures
  • Examples were developed for Plankton, Aerosol, Cloud, ocean Ecosystem (PACE)

https://pace.oceansciences.org/gallery.htm?id=e-brochure
Example Communication Materials

- Online Quiz
  - Developed for PACE and Surface Water and Ocean Topography (SWOT)

https://pace.gsfc.nasa.gov

https://swot.odyseallc.net/demo_swotquiz.html
Example Communication Materials

- E-brochures
- Short videos
Example Communication Materials

- Infographics
- "Fact Sheets"

State of the Science FACT SHEET

Ocean Salinity

Salinity, defined as the amount of salts dissolved in water, is a fundamental ocean property that has been measured for over a century. Recent advances in monitoring salinity include satellite sensing, moored arrays, and a global constellation of drifting instruments. Salinity's abundance influences the movement of heat and water at global scale within the ocean, as well as between the ocean and the atmosphere, with its distribution revealing trends in Earth's water cycle, affecting the shallow marine environment, marine productivity, and the sea's oxygen saturation, with far-reaching impacts on weather and the blue economy.

Ocean Motion and the Heat It Carries

Salinity contributes to driving the movement of seawater — and heat along with it — around our planet. How? By regulating seawater's density, the primary factor driving ocean motion below the wind-blown surface, salinity, along with temperature, determines the density and, in turn, the ocean's flow, resulting in the transport of heat and water.

THE UNITED STATES DEPARTMENT OF COMMERCE

HOW SWOT WILL HELP

Salinity will keep a sharp eye on our ocean waters. Its data will be used to better prepare life along our coasts.

WHY THE SWELLING OCEAN MATTERS

From the deep ocean to our coasts, SWOT has it covered.

WHY THE FRESH WATER MATTERS

California leads the nation in terms of economy, population, and agriculture. Its success depends on fresh water.

HOW SWOT WILL HELP

SWOT will detect freshwater bodies much smaller than those currently monitored by water-level satellite sensors.

10X

SWOT will map the height of sea surface features within half an inch. This will provide new insight on how our ocean transports heat, carbon, and tidal energy.

1515

The Gulf Stream, as described by Spanish explorer Porcile De León, Today, high-resolution data are needed to study its flow, eddies, and potential coastal impacts.

75%

Most of California’s rain falls on several small rivers. However, 86% of the water demand is from the southern two-thirds of the state.

3.5X

SWOT will observe 60% of the global water surface in 3.5 times less time than is currently done by surface drifters.
Example Communication Materials

- Develop salinity materials for OceanObs’19?
- Other opportunities?
Discussion

✓ SPURS-2 Data Tool
✓ “Learn More”
✓ “Highlights”
✓ Example Communication Materials
  • Let’s Talk!

avdecharon@gmail.com