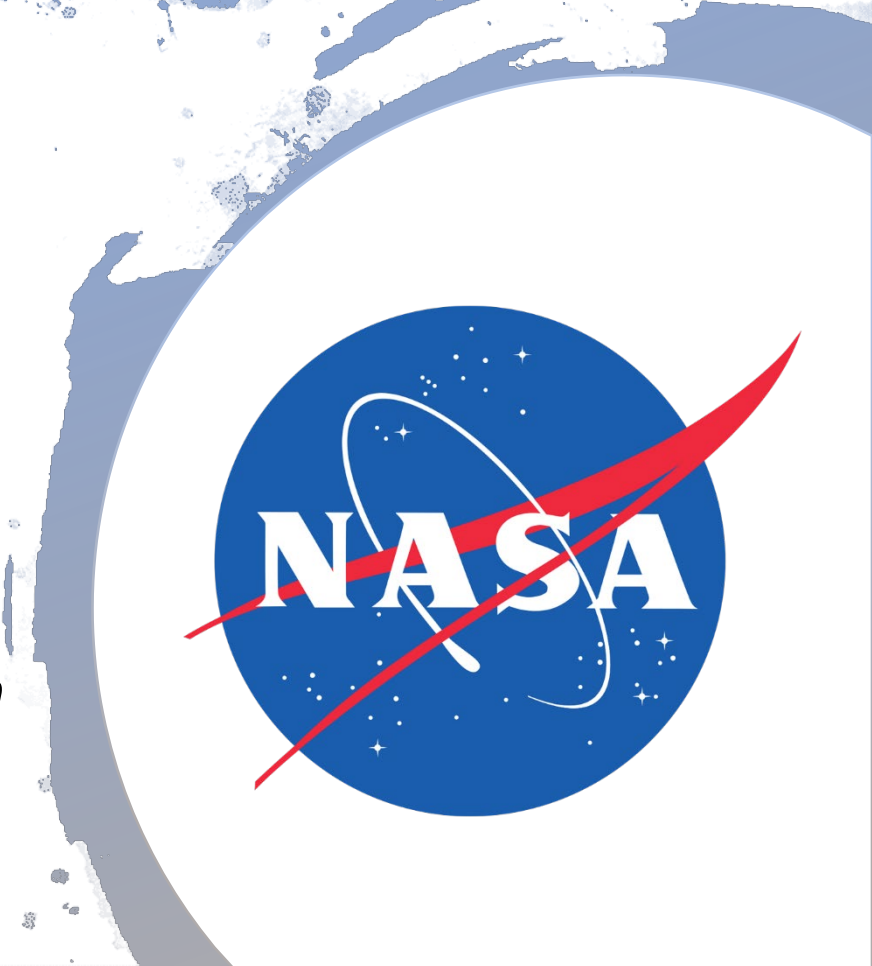


USFS – NASA Virtual Pitch Fest / June 3, 2020

Integrating NASA and USFS Datasets for a High-Resolution Annual Forest Carbon Monitoring System

By: Alex Rudee, World Resources Institute



About Me



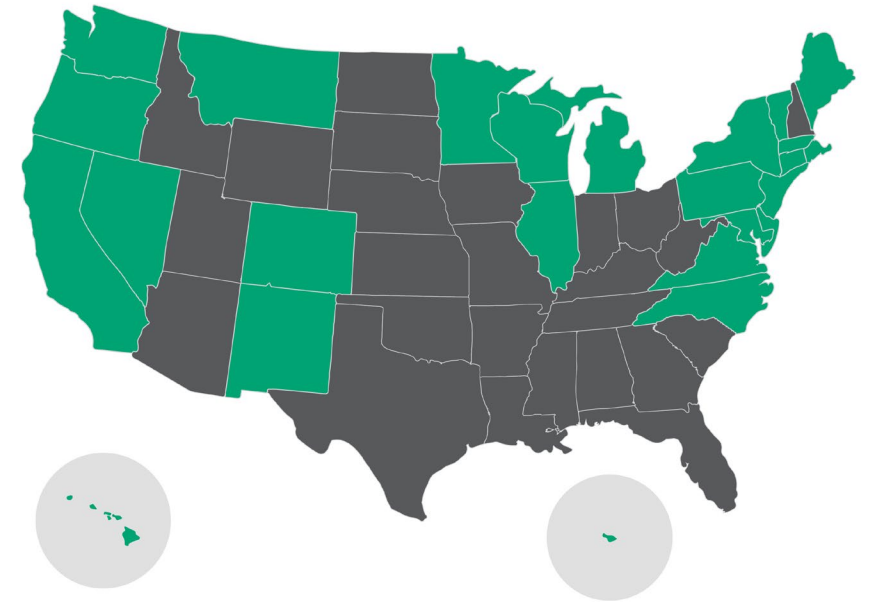
Alex Rudee
Associate, Carbon Removal
World Resources Institute



Partnering with US Climate Alliance (24 states) to
improve GHG inventories for natural and working lands



Team led by George Hurtt, University of
Maryland (Science Team lead for NASA CMS)



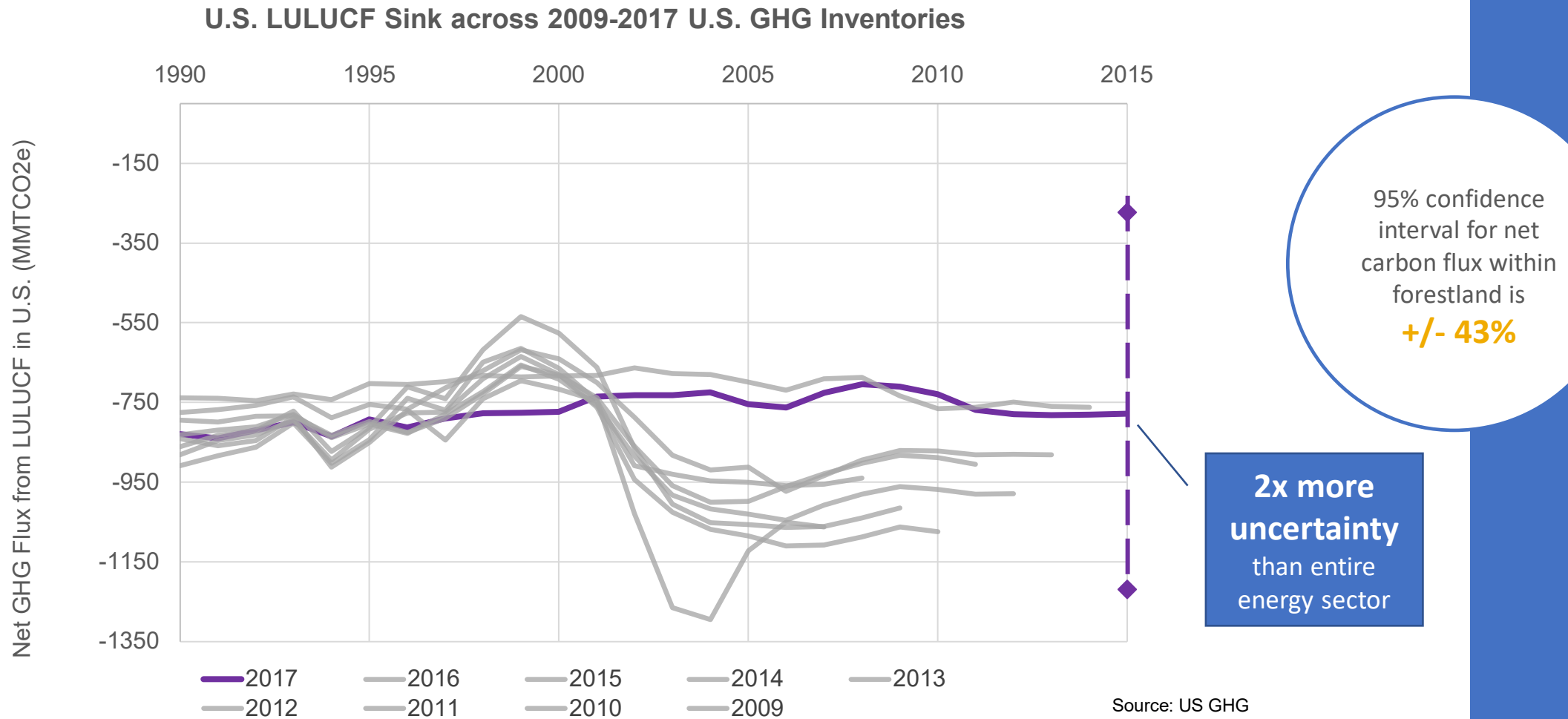
The Idea



National High-Resolution Annual Forest Carbon Monitoring System

- Brings together core assets from USFS and NASA to create a new breed of GHG inventory for trees & forests
 - Functions across multiple spatial and temporal scales
 - Covers land base wall-to-wall
 - Attributes causes of carbon stock changes
- Builds on a successful ongoing partnership between University of Maryland and USFS

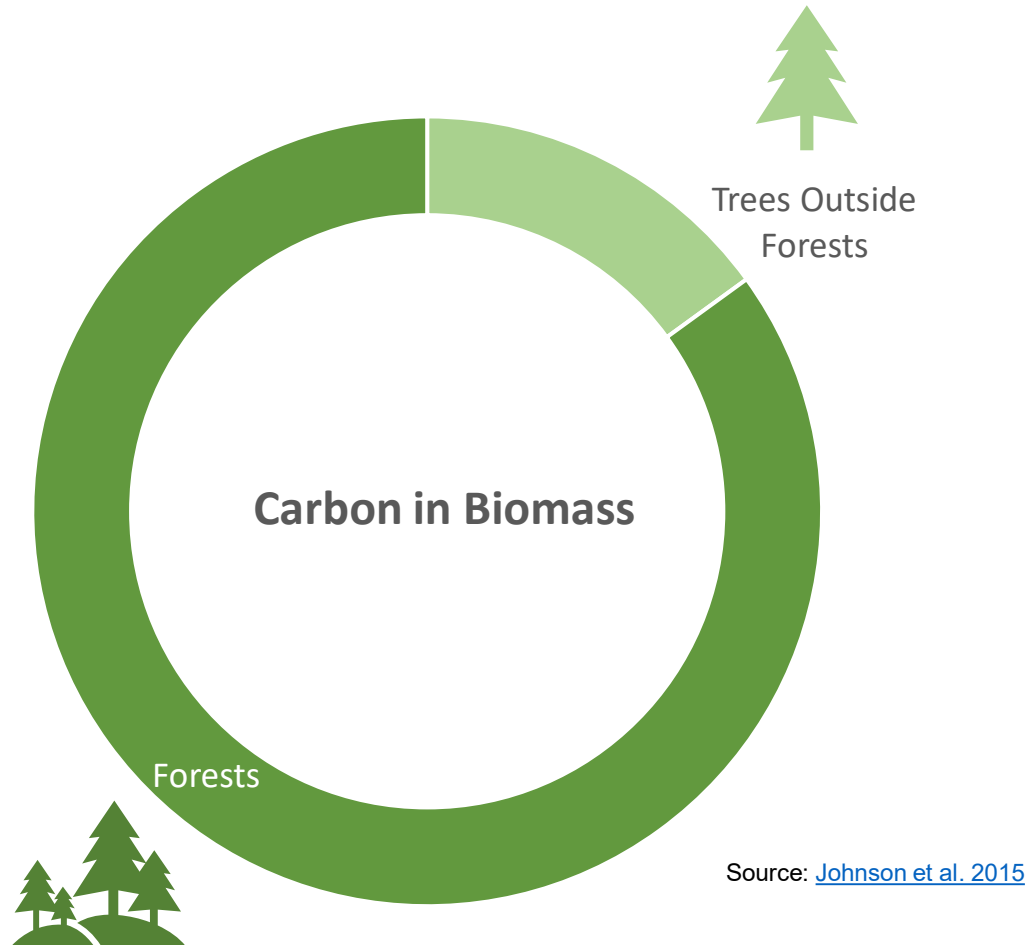
Uncertainty in Annual Carbon Stock Change



Source: US GHG Inventory Archives, courtesy of Rick Duke

Issues Addressed

Incomplete Coverage of Carbon Stocks



Trees outside forests hold at least **15%** of carbon in biomass but aren't systematically included in FIA

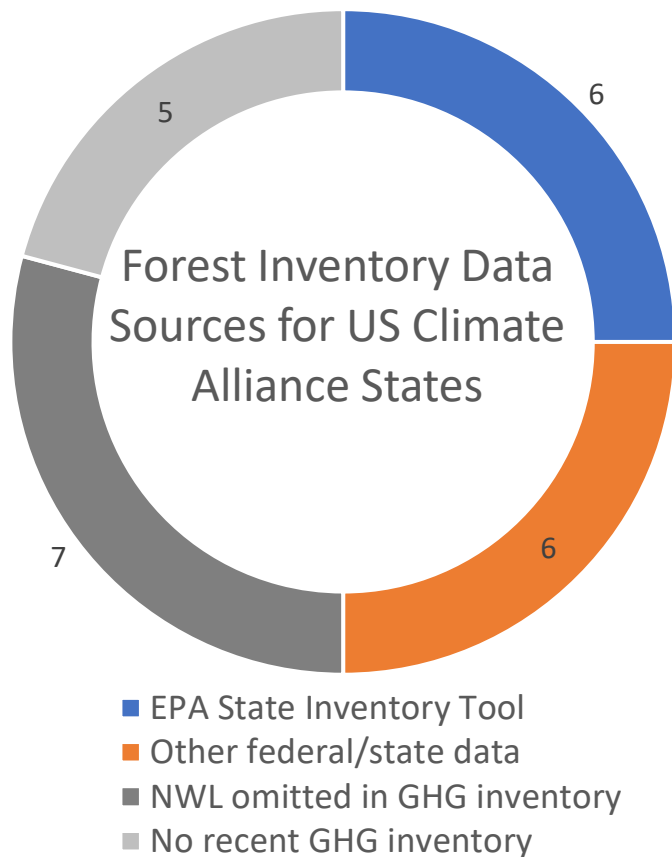
Issues Addressed

Limitations for Forest Planning

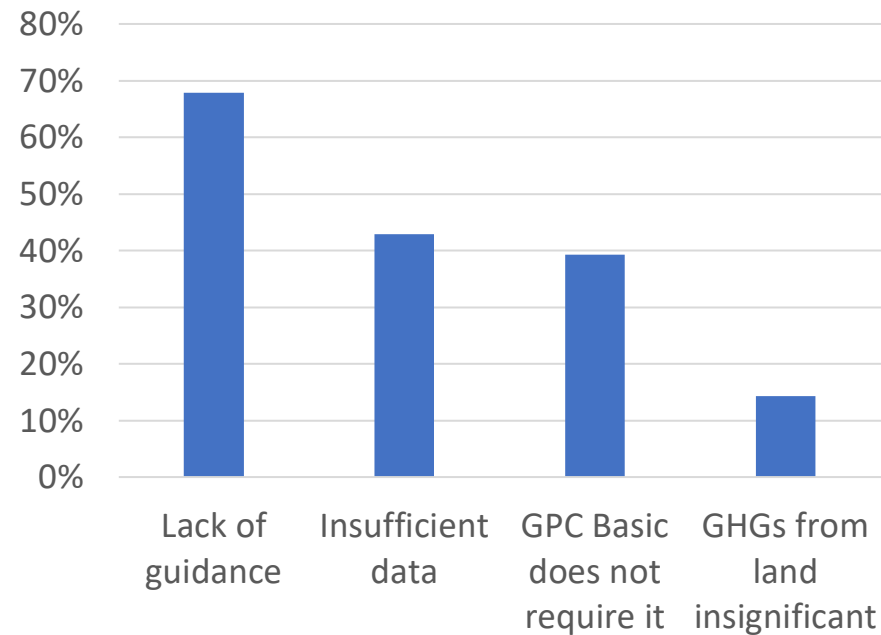
- Remeasurement cycles of 7-10 years blend **disturbance impacts across time**
- Plot-based statistical estimation obscures **spatial distribution of carbon dynamics** within a forest
- **Modeling for future planning** is not integrated into inventory methodology

FIA has limited capacity to inform **forest carbon management** on its own

Limitations for State & Local GHG Inventories



Local governments aren't including forests in climate action planning because of...



Source: Donna Lee, Rich Birdsey, Nancy Harris

Most states and cities do not track carbon in trees & forests due to **insufficient or unreliable data**

Issues Addressed

Leveraging NASA Data Sources

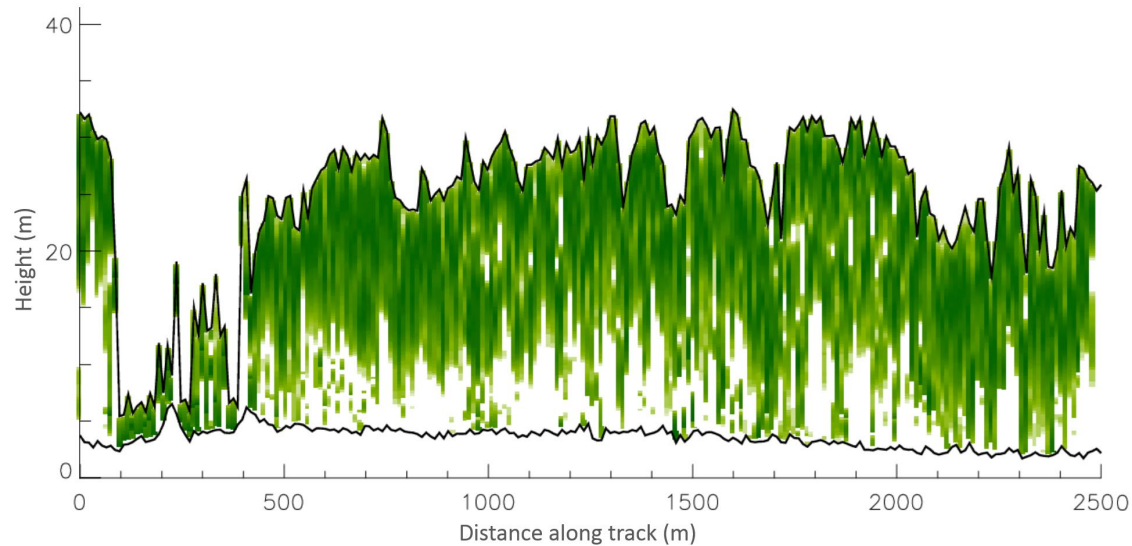


Image from GEDI

LIDAR (e.g. GEDI):
Baseline data on forest cover and structure

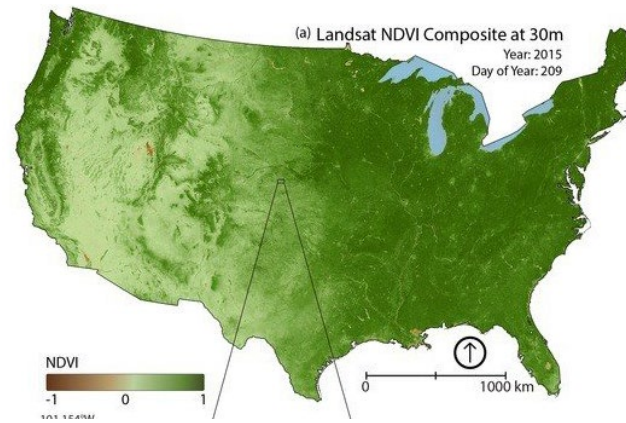


Image from Robinson et al. 2017

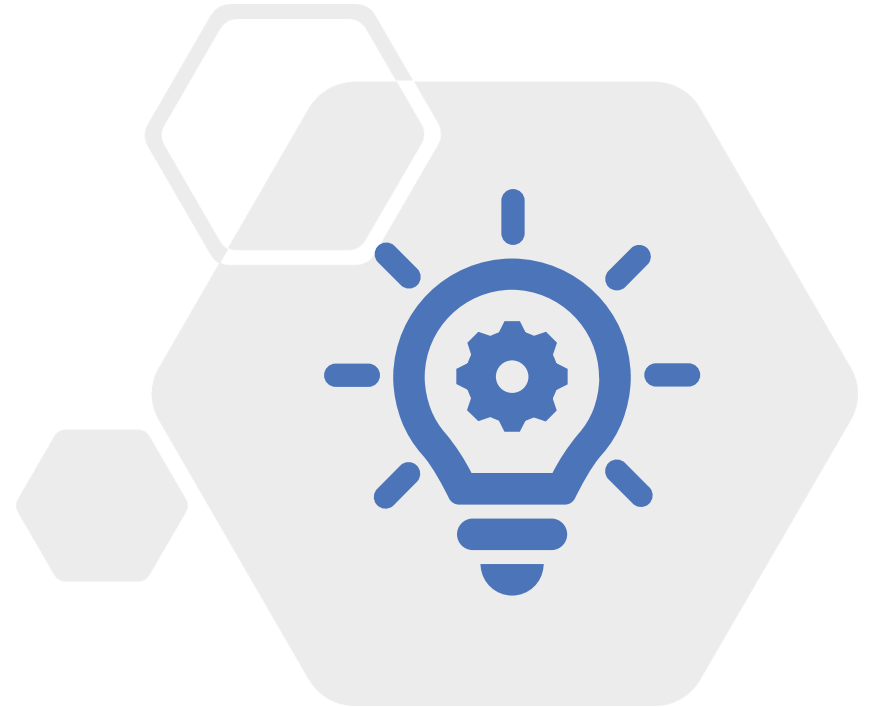
Optical Imagery (e.g. Landsat):
Data on forest cover gain and loss updated in near real time



The Solution

Integrate NASA and USFS data products to create a **high-resolution spatial inventory** of carbon stock changes in trees & forests that will complement current USFS tools by:

- Enhancing the **spatial coverage and resolution** of current inventory methods
- Providing **consistent products** for annual monitoring and future planning
- **Attributing causes** of carbon stock change to inform land management and policy
- Making products available at **multiple scales**, from local to national (or global)





Thank You!

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