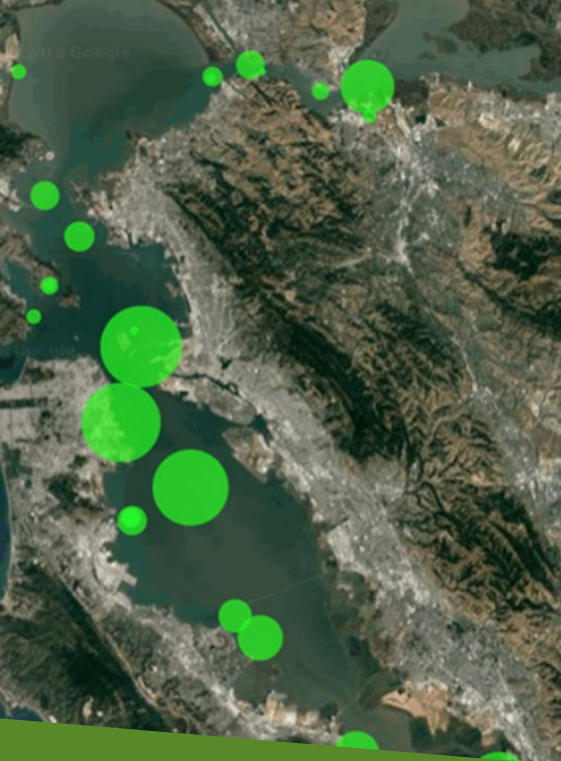




An Overview of NMS Modeling

Hydrodynamic, tracer, and biogeochemical modeling in the NMS

SFEI

SAN FRANCISCO
ESTUARY INSTITUTE

Jordyn Moscoso

RMP Annual Meeting, 2026

NMS Modeling Team



Allie King



Farid Karimpour



Jordyn Moscoso



Rachel Allen



Dave Senn

NMS Modeling Team



Allie King



Farid Karimpour



Jordyn Moscoco



Rachel Allen



Dave Senn

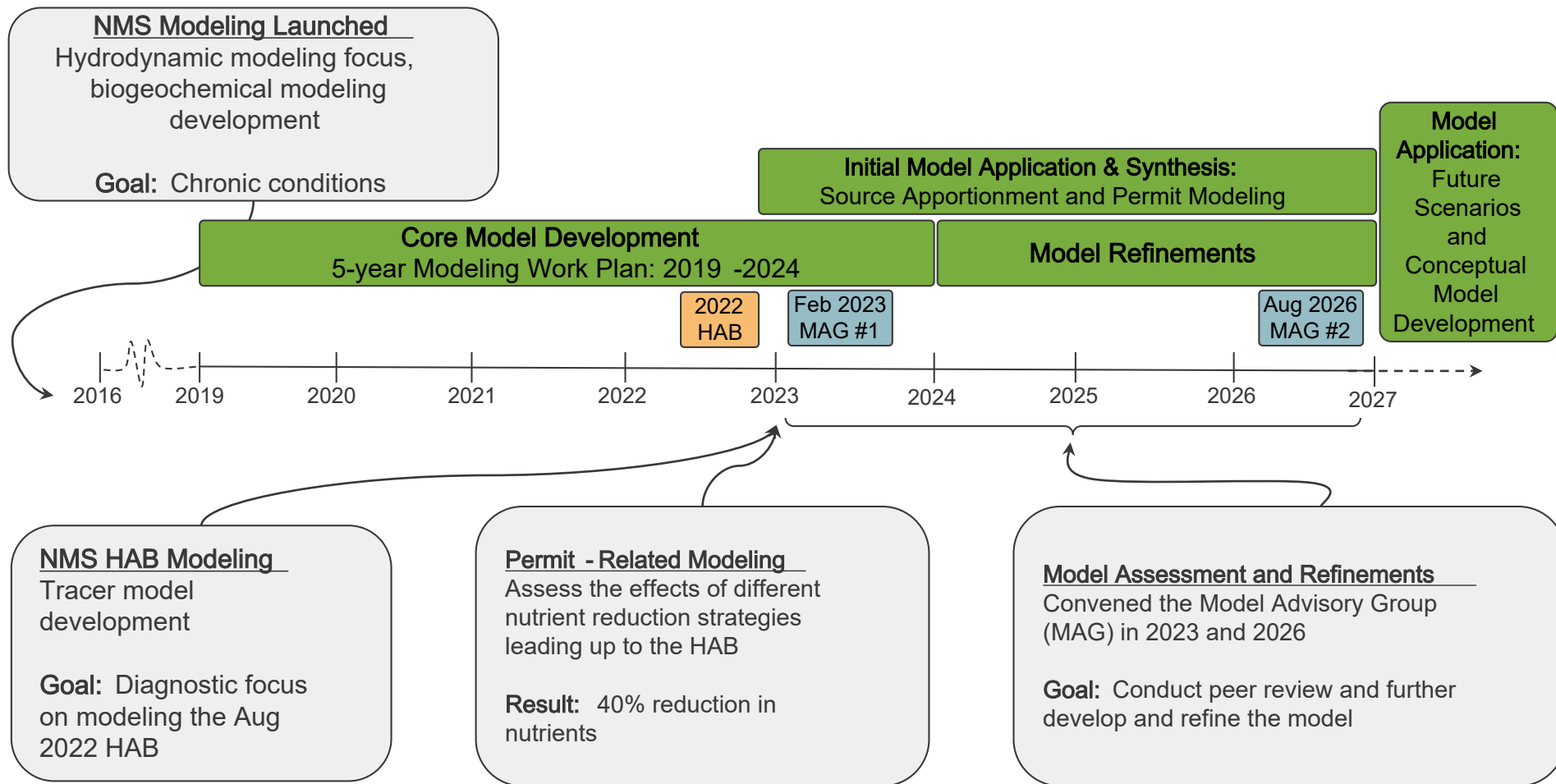


Pradeep Mugunthan,
Spheros



Rusty Holleman,
GEI Consultants

Timeline of NMS modeling



Three groups of SF Bay models used in the NMS

**Hydrodynamic
Model**

**Tracer
Model**

**Biogeochemical
Model**

The hydrodynamic model simulates physical processes in the Bay and is the backbone of all other models

Hydrodynamic Model

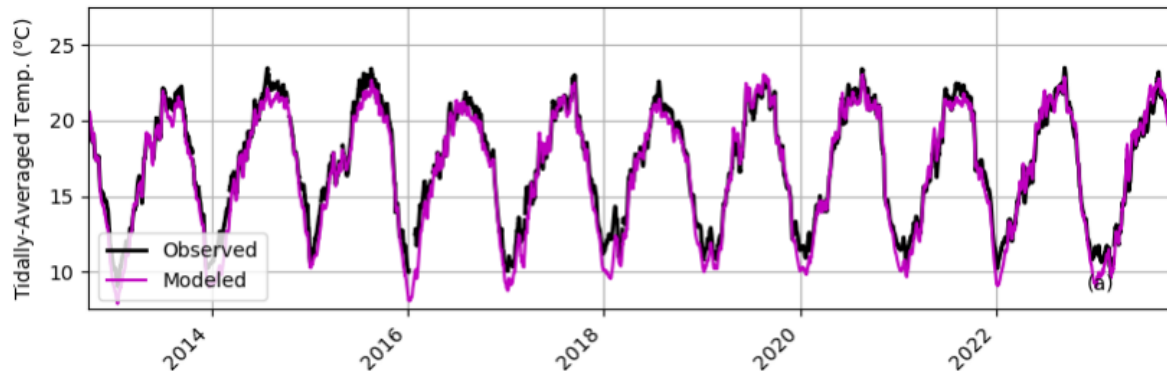
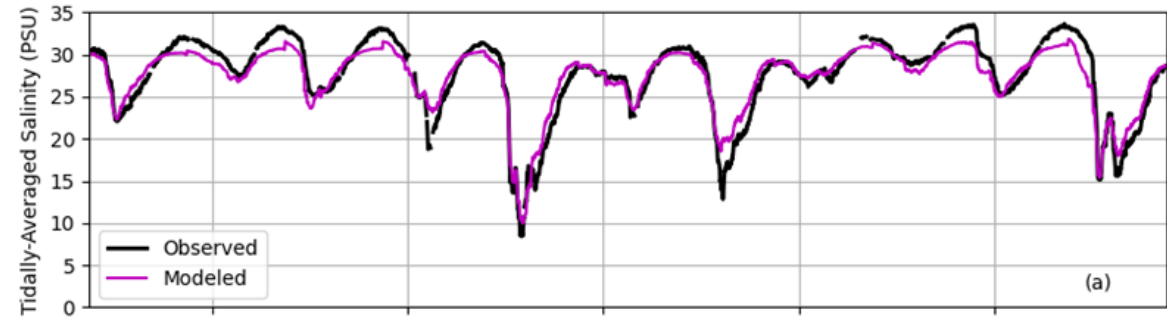
SFEI San Francisco Estuary Institute

The SFEI San Francisco Bay Hydrodynamic Model: Performance for Water Level, Velocity, Salinity, and Temperature Over Eleven Years

King, et al. 2026

The hydro model is a highly calibrated and validated model of salt, temperature, water levels, and velocity from 2013 to 2023

Station: USGS San Mateo Bridge (Upper)
Run: wy2013-wy2023-v24



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Hydrodynamic Model

SFEI San Francisco Estuary Institute

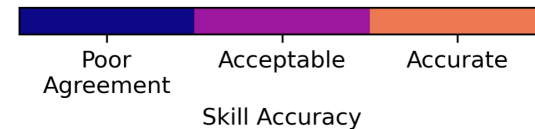
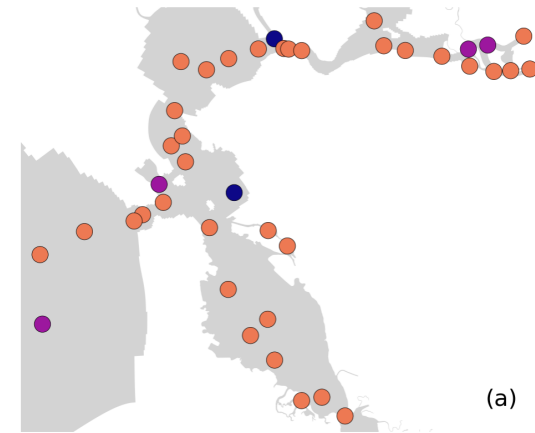
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Velocity Validation

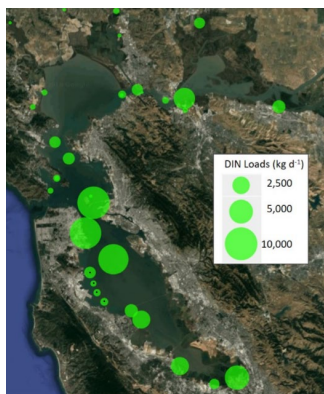


SFEI

The tracer model is a idealized nutrient model that can be used as a rapid way to assess management scenarios

One tracer for each modeled source:

- POTW
- Refineries
- Ocean
- Delta



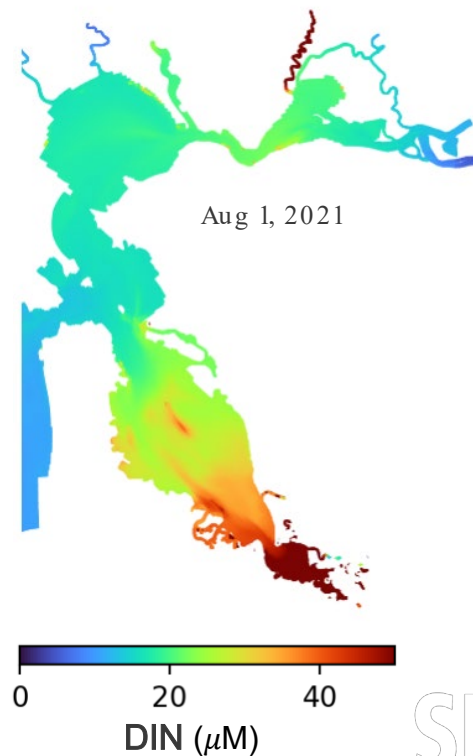
Tracer Model

San Francisco Bay Nutrient Management Strategy

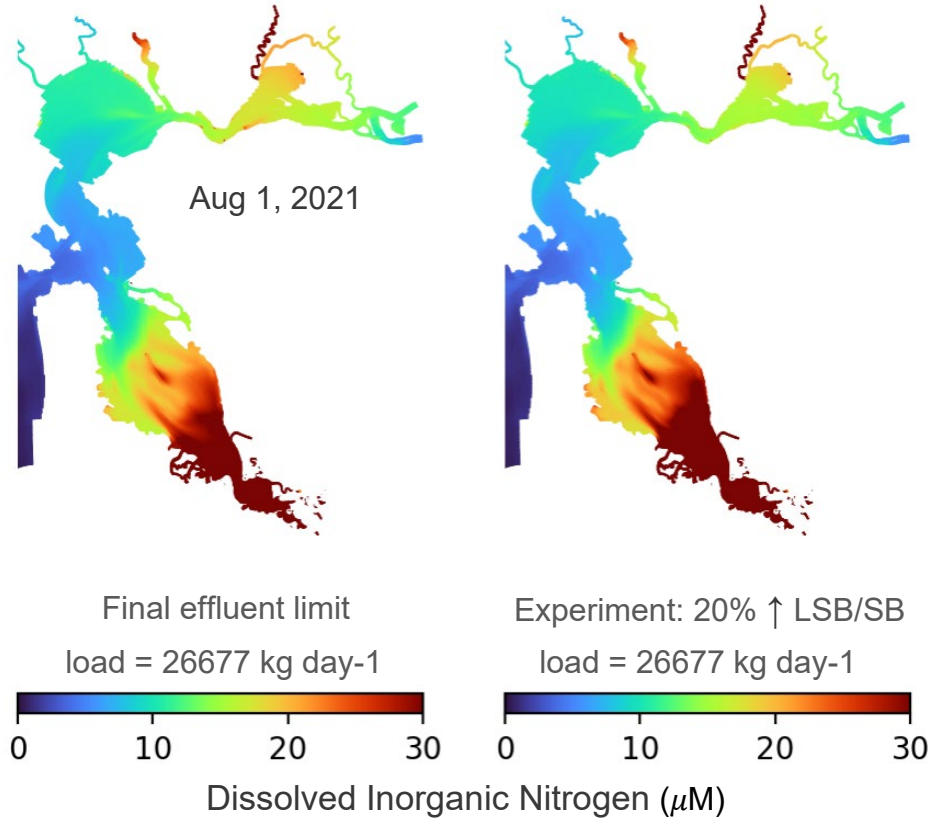
**Pilot Study: Characterizing
Relative Contributions of Nitrogen
from Distinct Sources**

Allen, et al. 2026

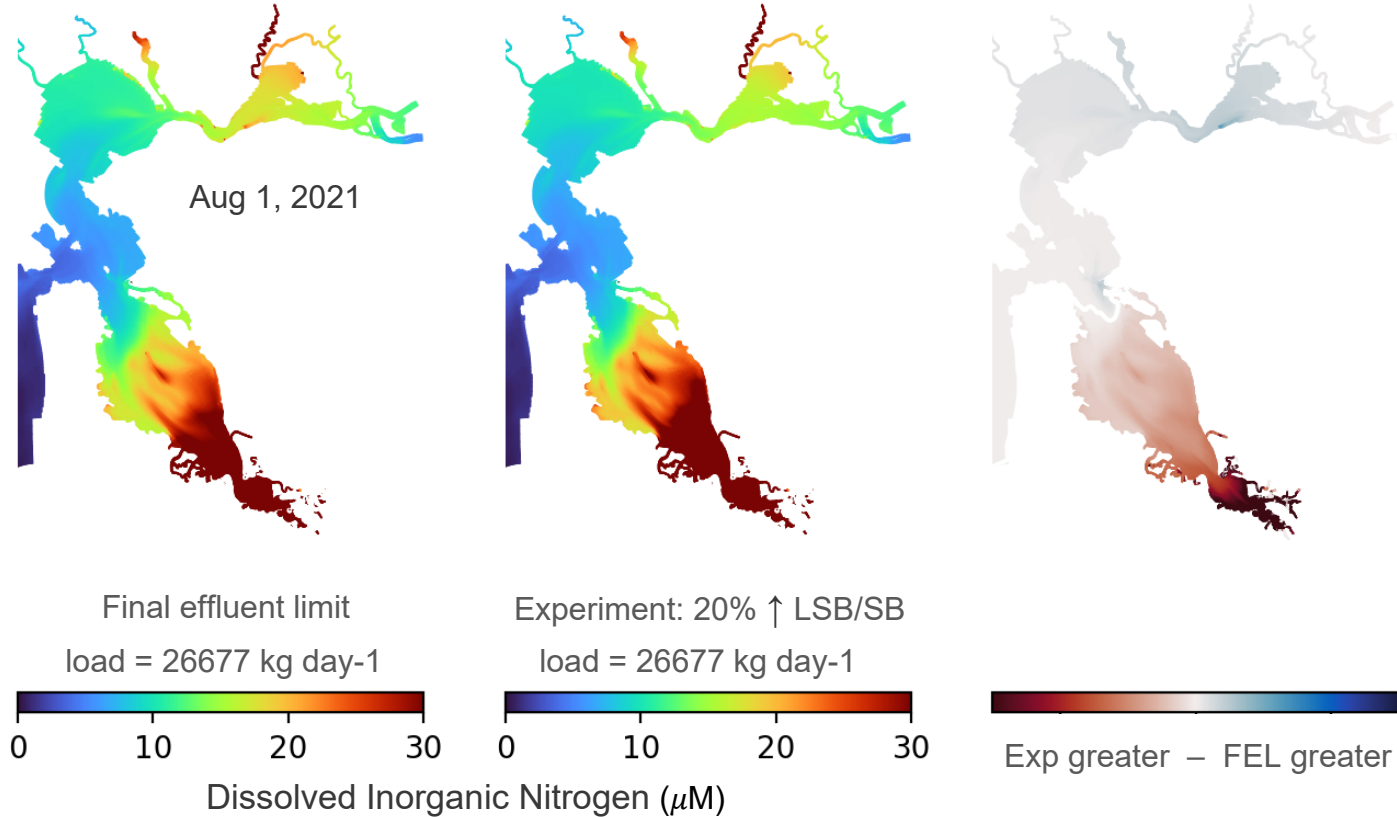
Example question:
How do management
scenarios impact
concentrations
across the Bay?



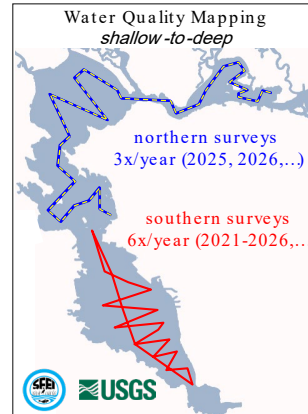
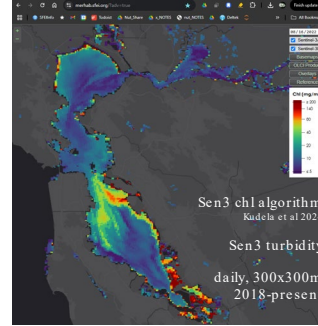
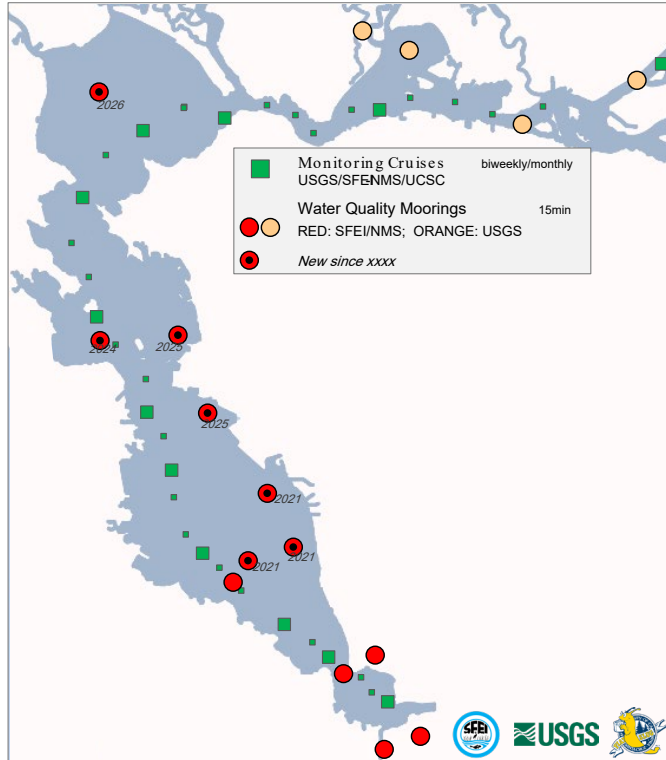
The tracer model is a idealized nutrient model that can be used as a rapid way to assess management scenarios



The tracer model is an idealized nutrient model that can be used as a rapid way to assess management scenarios



The biogeochemical model is a complex ecosystem model that can be used to diagnose nutrient cycling, transport, and losses in the Bay



Biogeochemical Model

San Francisco Bay Nutrient Management Strategy

Open Bay Biogeochemical Modeling Progress
Report for the Model Advisory Group

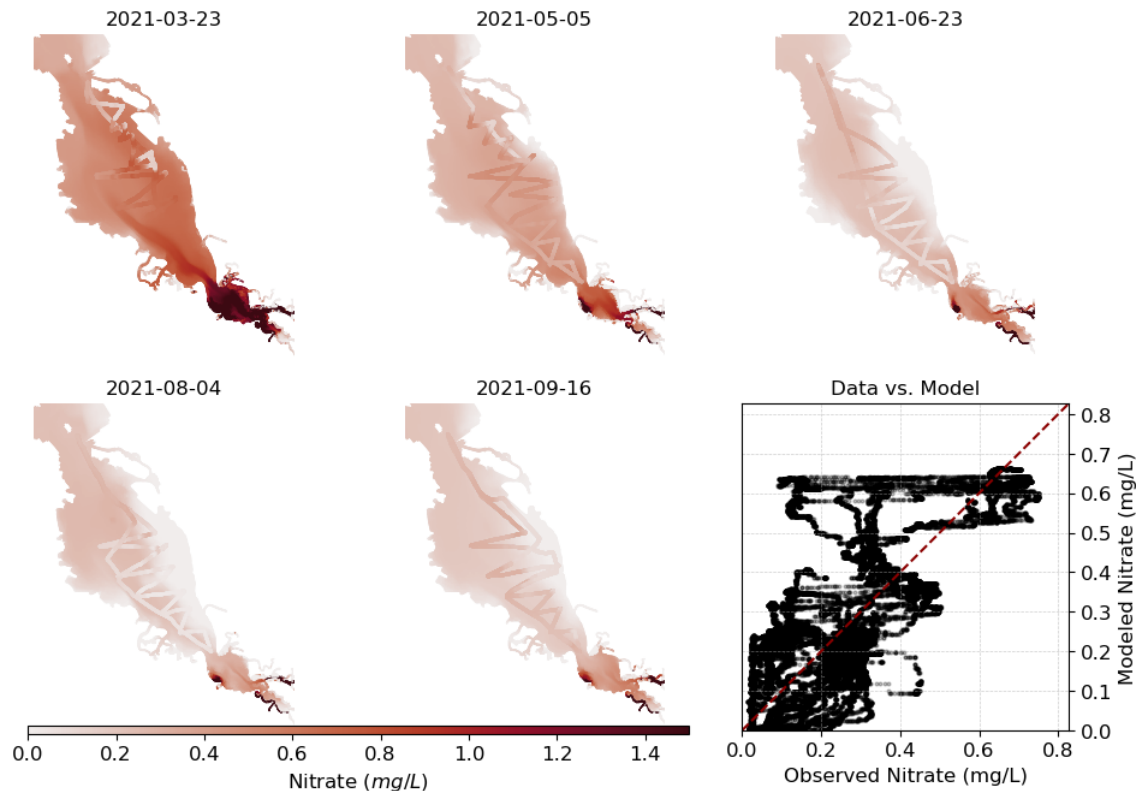
San Francisco Bay Numerical Modeling Update,
FY2023-FY2026

Moscoso, et al. 2026

Our recent focus
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Surface Nitrate Concentration



Biogeochemical Model

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Moscoso, et al. 2026

The inclusion of
remote sensing
turbidity and sediment
denitrification helped
capture seasonal
patterns of nitrogen in
the Bay

Thank you!

Check out the pdf links to reports on this slide

Hydrodynamic Model

SFEI San Francisco
Estuary Institute

The SFEI San Francisco Bay
Hydrodynamic Model: Performance
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Temperature Over Eleven Years

King, et al. 2026



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Additional Slides

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Main slide colors

Color Palette

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H2: 22pt reg

Paragraph: 18 pt

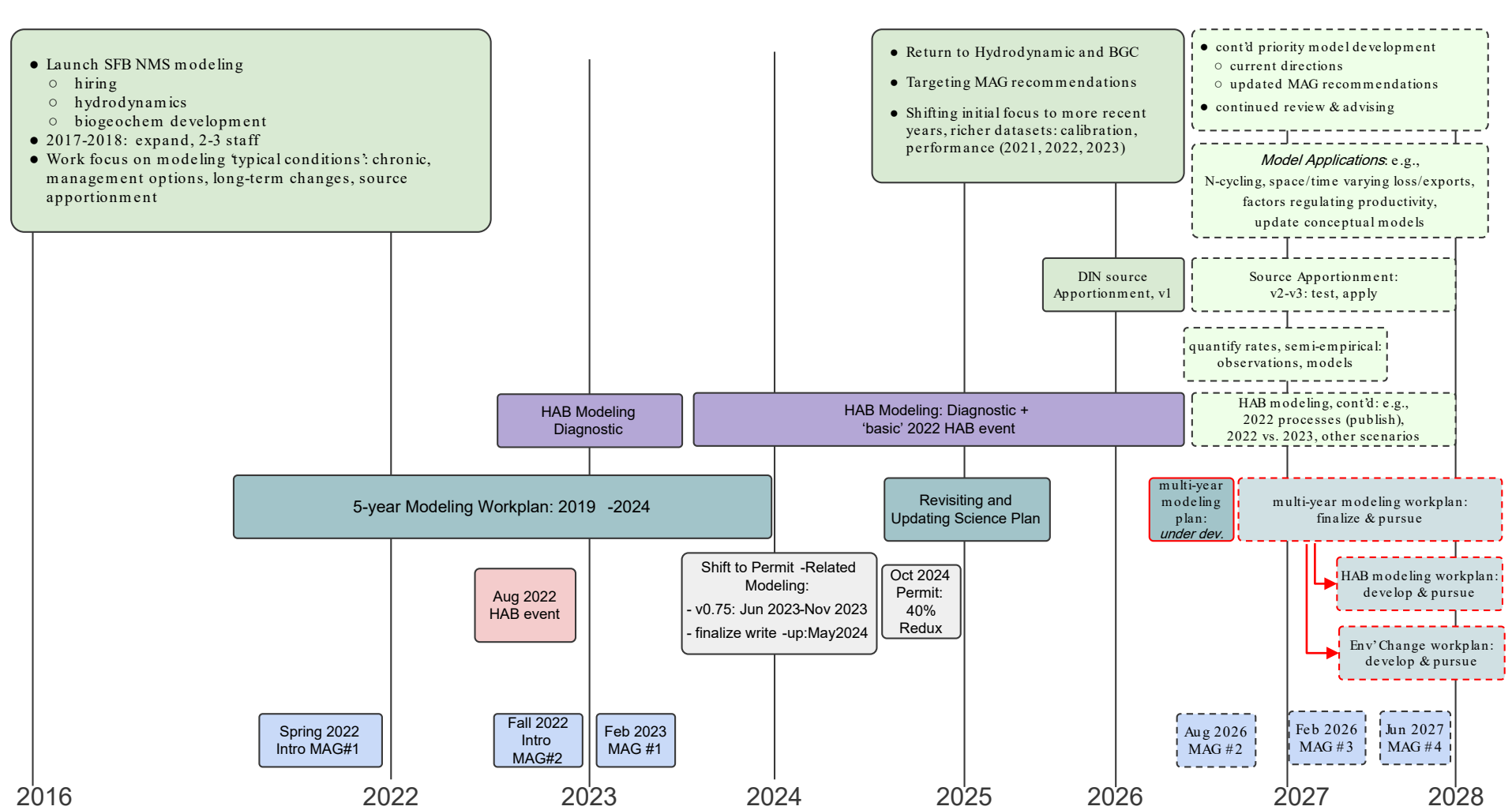
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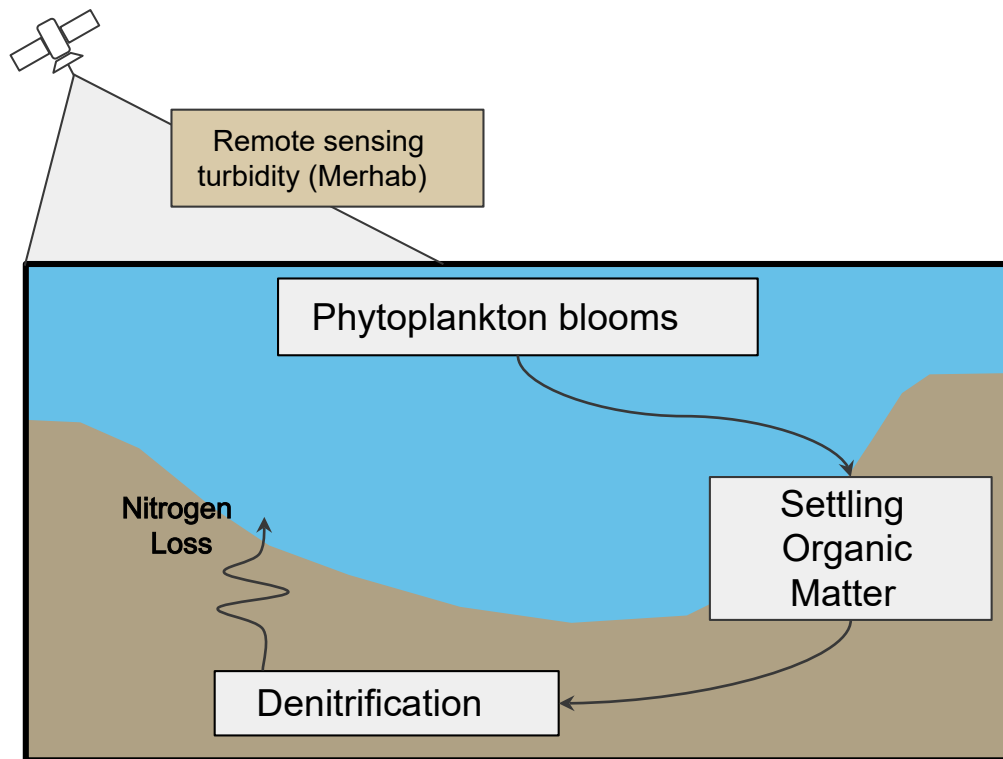
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Photo credit: 11 pt

**Style
Guide**



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Biogeochemical Model

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