San Francisco Bay HSC

September 2026

NOAA Updates

Jeffrey Ferguson

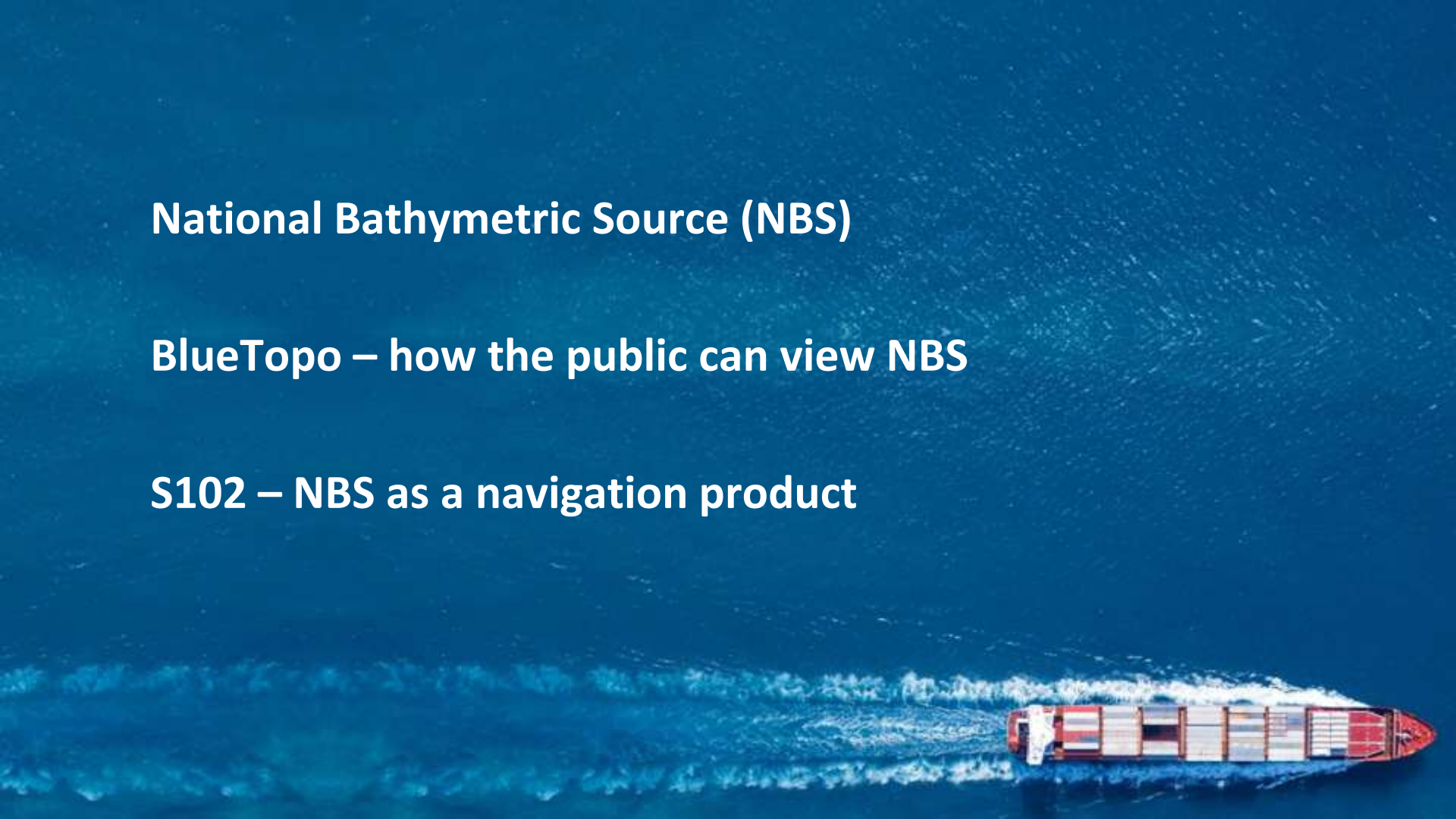
CA Navigation Manager

Office of Coast Survey

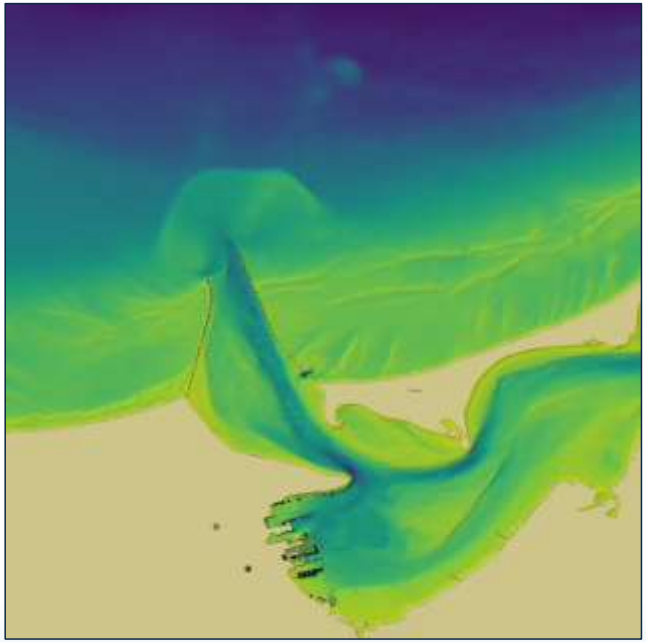
National Bathymetric Source (NBS)

BlueTopo – how the public can view NBS

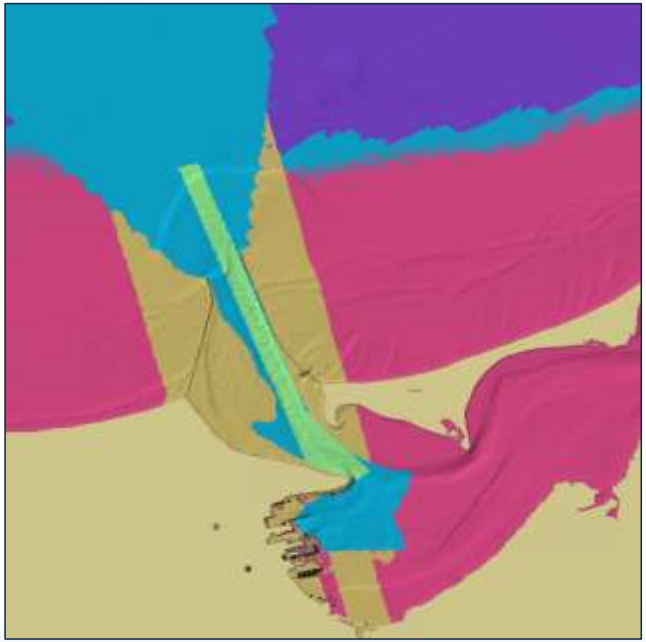
S102 – NBS as a navigation product



Bathymetry Providers



Compiled Bathymetry

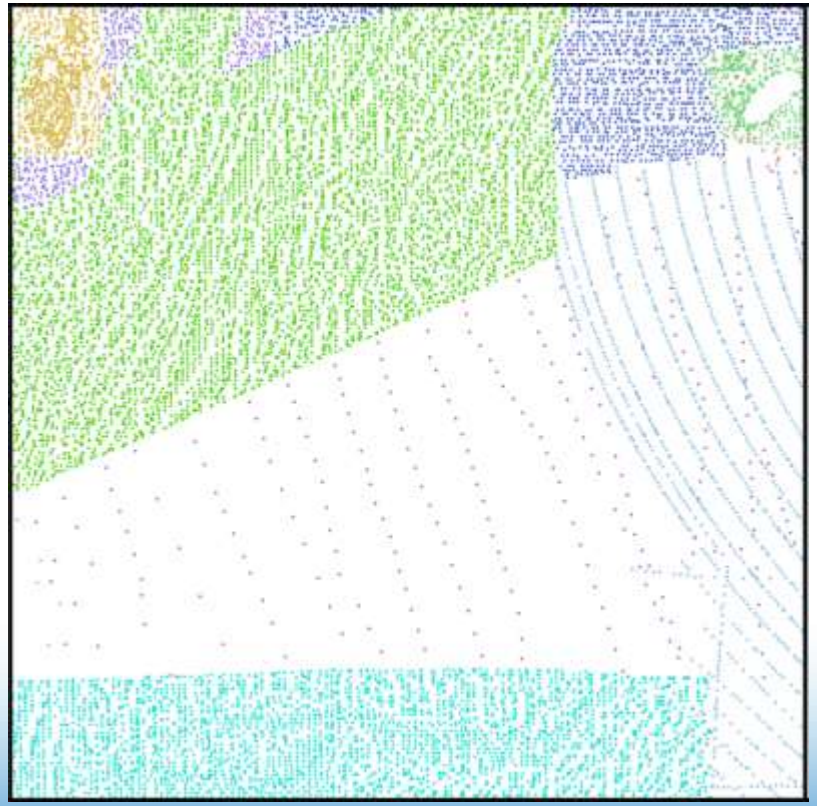


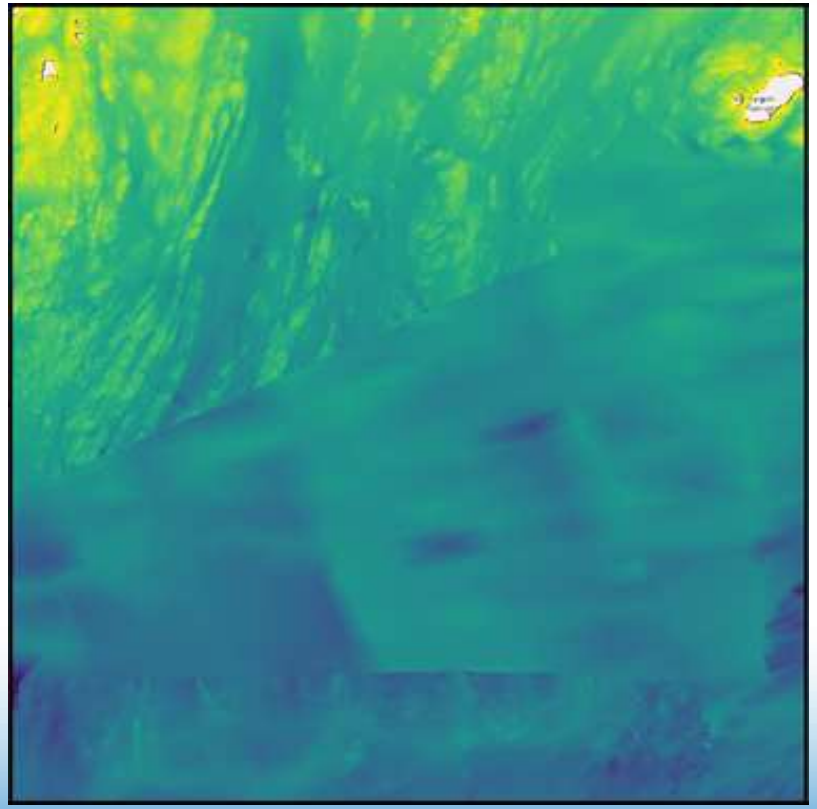
Bathymetry Sources

- NOAA Hydro
- NOAA Lidar
- USACE Hydro
- USACE Lidar
- USGS

NOAA Coast Survey

Interpolating for Coverage





Providing Compiled Bathymetry

Navigation

- ENC
- S-102

Internal

- Planning

Public

- BlueTopo
- Modeling

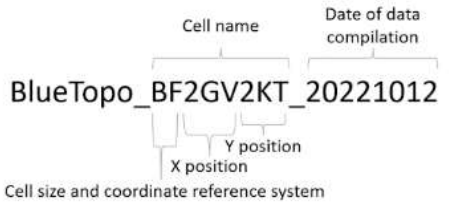
BLUETOPO
Data Specifications

BlueTopo™ Specifications

Table 1. BlueTopo Product Summary	
Format	3 layer GeoTIFF • Elevation • Uncertainty • Raster Attribute Table (RAT) contains metadata (see Table 2)
Units	Meters
Resolution	The available resolution corresponds to the available navigational product.
Vertical Coordinate Reference System	North American Vertical Datum 1988 (NAVD88), positive direction is up.
Horizontal Coordinate Reference System	Universal Transverse Mercator (UTM)

BlueTopo is available for download as three layer GeoTIFFs with elevation, uncertainty, and raster attribute table (RAT) layers. All layers are presented as 32-bit floating point values. See FAQ for information on how to download the GeoTIFFS

The current naming convention for BlueTopo is a combination of several worldwide schemes with different cell sizes. A definition of the current tile names and a link to the data can be found in a geopackage in the BlueTopo bucket on AWS. We expect to update the tessellation scheme and the associated naming convention in the future, but this file will be kept up to date with the latest tiles available. Depending on region, you can expect to see new BlueTopo files with the latest data, weekly to monthly. The nowCOAST map viewer makes BlueTopo available through a web map tile service and the viewer.



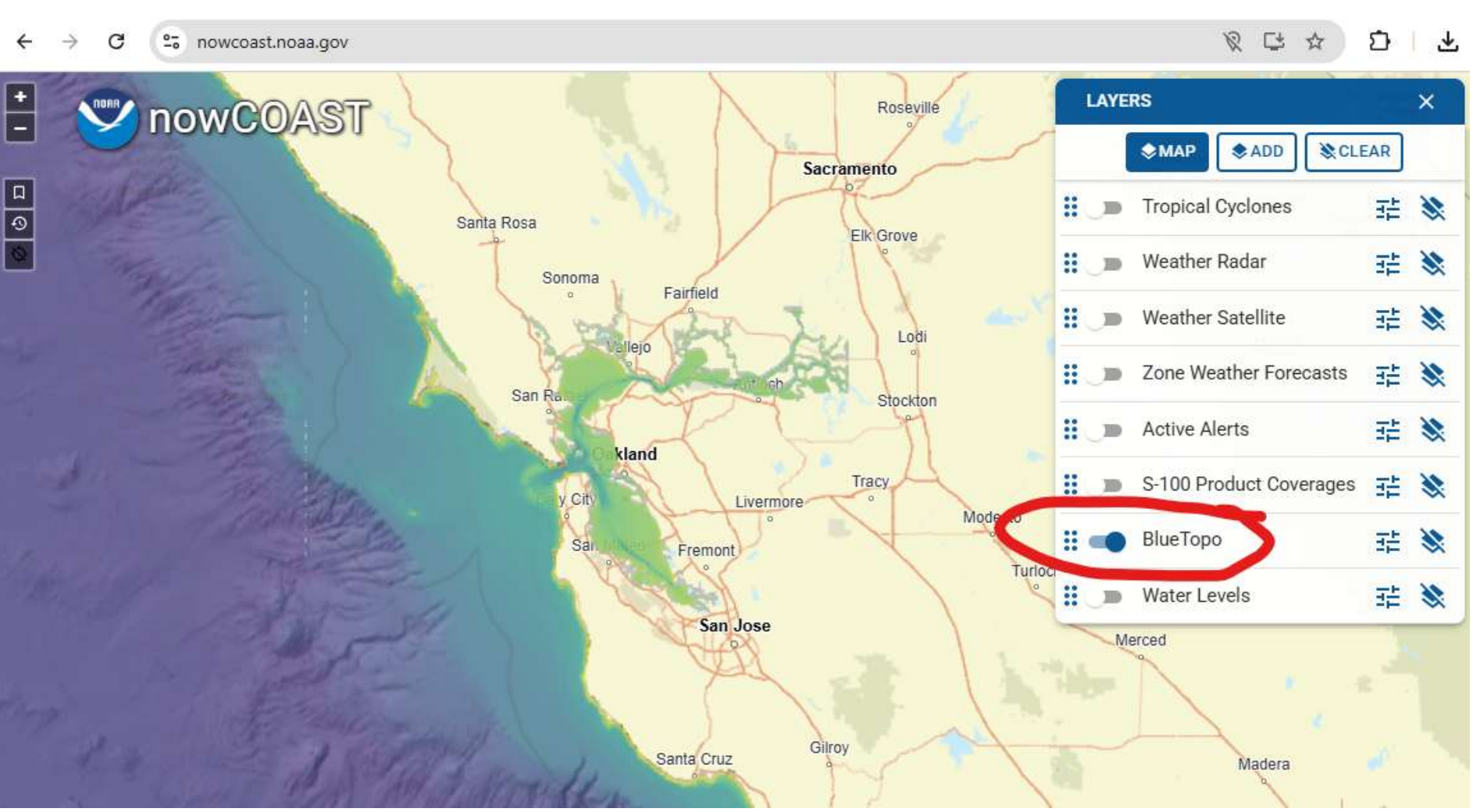
An example of the BlueTopo naming convention. The cell name excludes vowels and the numbers 0,1, and 3.

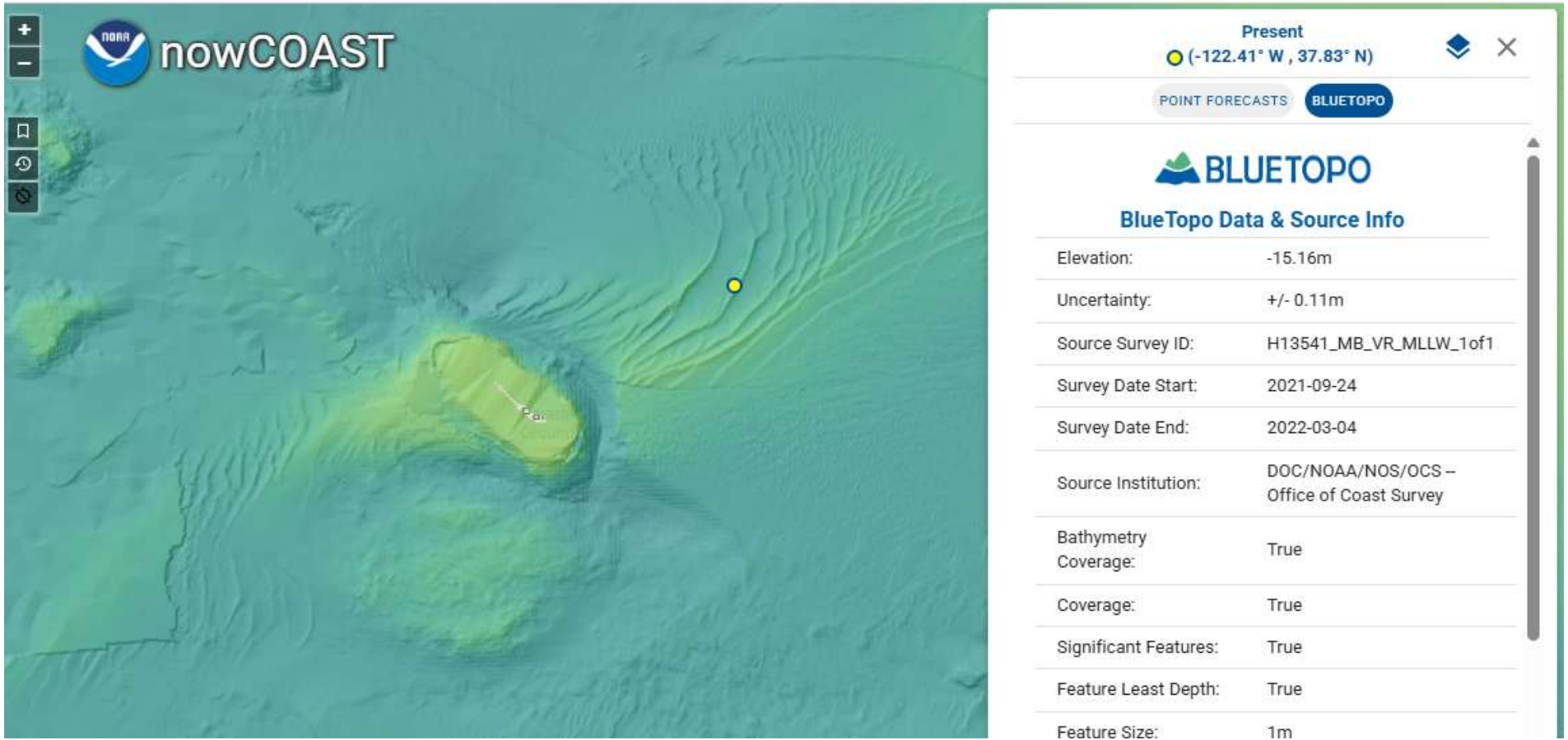
BlueTopo™ Information

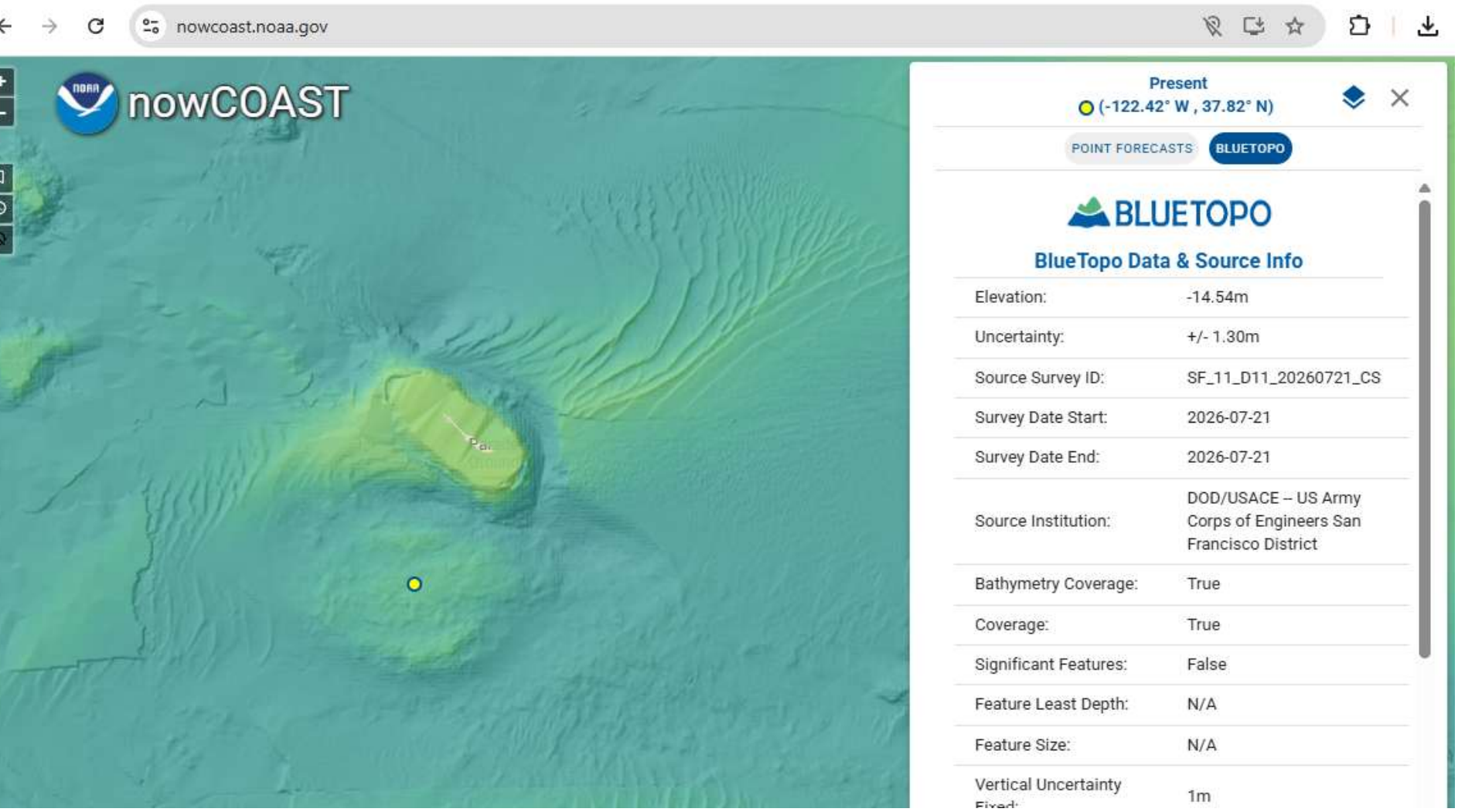
- Description
- Specifications
- Frequently Asked Questions (FAQs)

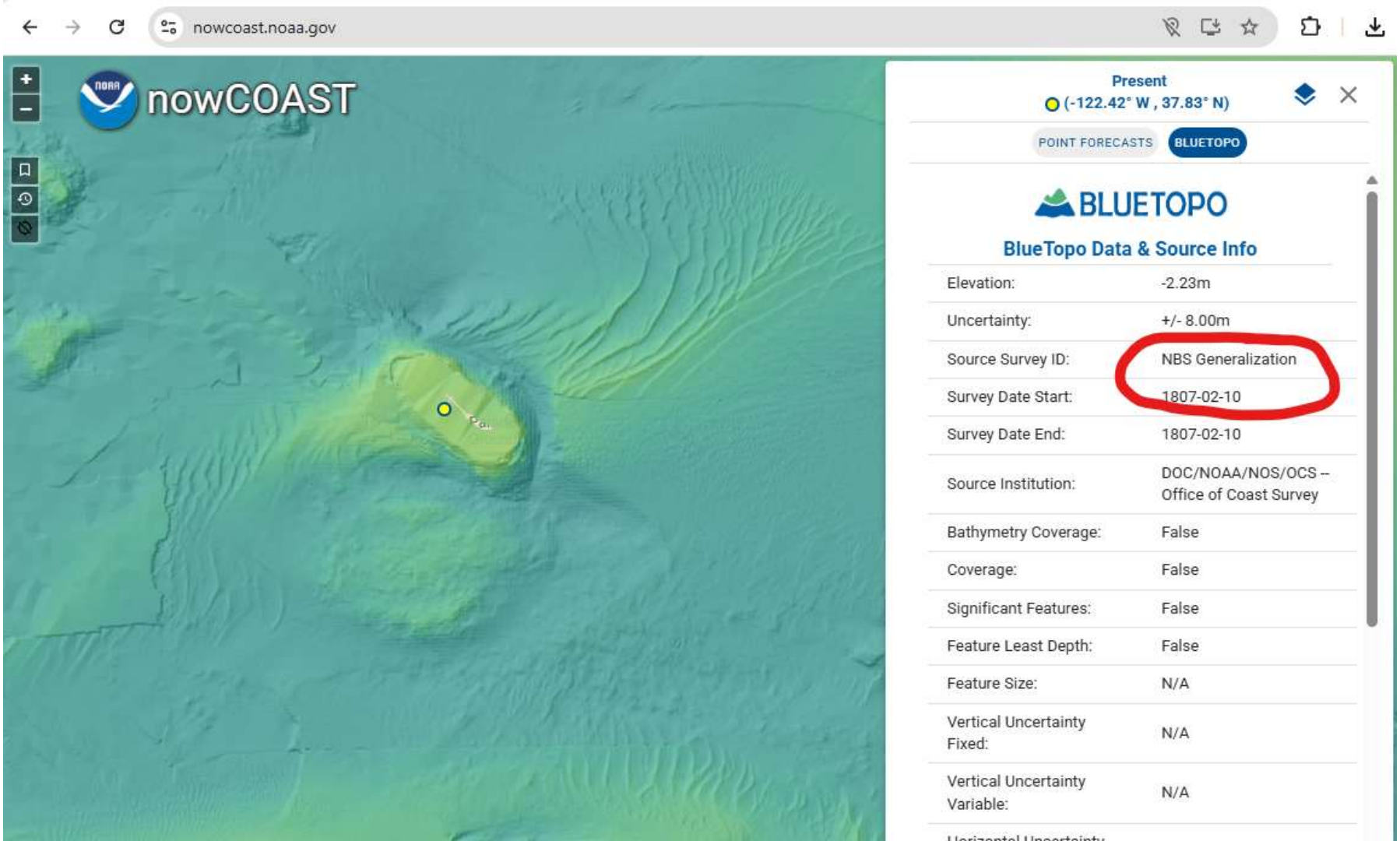
Related Links

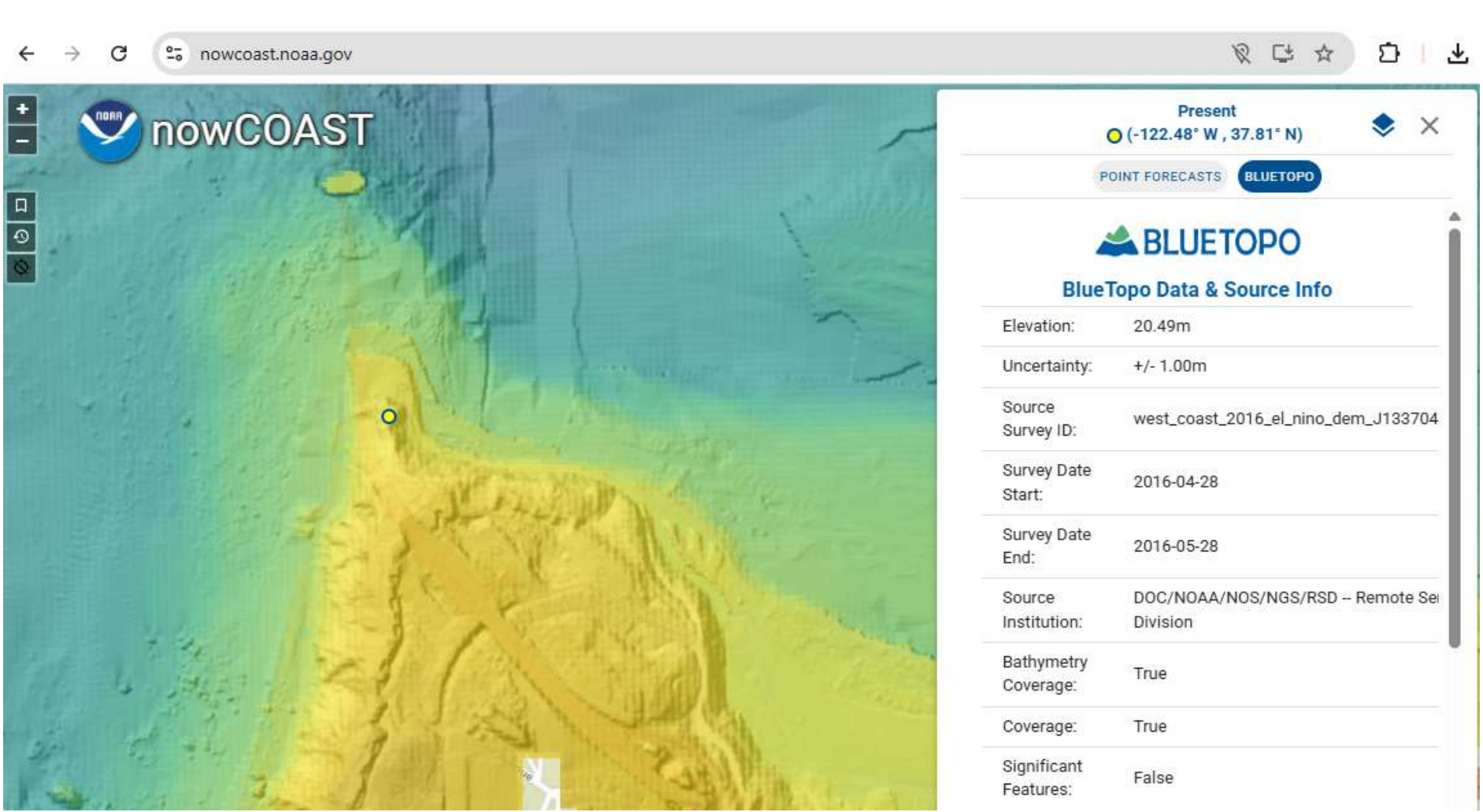
- National Bathymetric Source Program
- Link to Data
- Script Examples
- Blog Post
- Download Utility

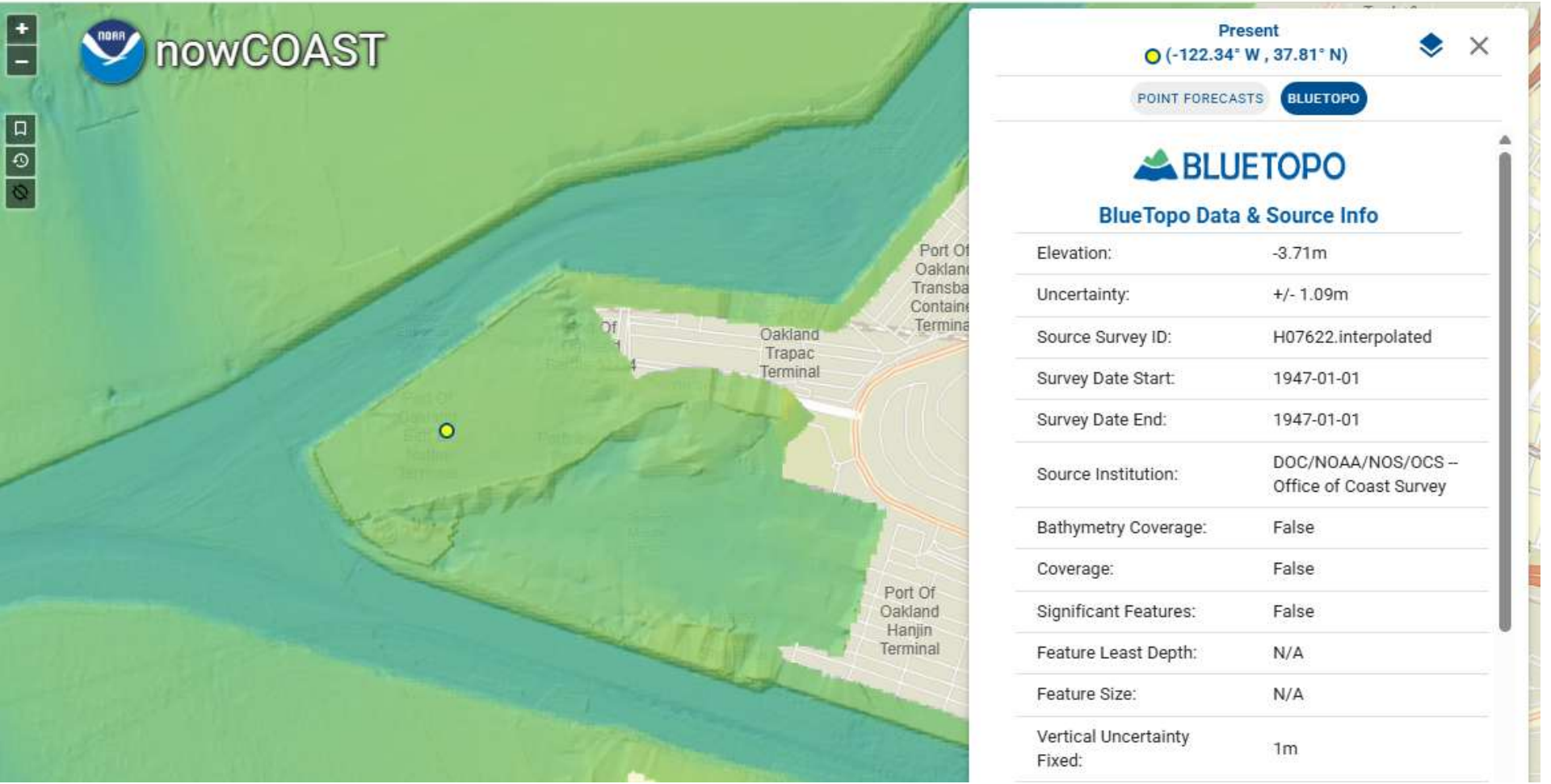

nowcoast.noaa.gov
nowCOAST
LAYERS
MAP
ADD
CLEAR
Tropical Cyclones
Weather Radar
Weather Satellite
Zone Weather Forecasts
Active Alerts
S-100 Product Coverages
BlueTopo
Water Levels
Roseville
Sacramento
Santa Rosa
Elk Grove
Sonoma
Fairfield
Lodi
Stockton
Tracy
Livermore
Fremont
San Jose
Merced
Gilroy
Santa Cruz
Madera


nowCOAST
Present
(-122.41° W , 37.83° N)
POINT FORECASTS
BLUETOPO
BLUETOPO
BlueTopo Data & Source Info
Elevation: -15.16m
Uncertainty: +/- 0.11m
Source Survey ID: H13541_MB_VR_MLLW_1of1
Survey Date Start: 2021-09-24
Survey Date End: 2022-03-04
Source Institution: DOC/NOAA/NOS/OCS – Office of Coast Survey
Bathymetry Coverage: True
Coverage: True
Significant Features: True
Feature Least Depth: True
Feature Size: 1m


nowcoast.noaa.gov
nowCOAST
Present
(-122.42° W , 37.82° N)
POINT FORECASTS
BLUETOPO
BLUETOPO
BlueTopo Data & Source Info
Elevation: -14.54m
Uncertainty: +/- 1.30m
Source Survey ID: SF_11_D11_20260721_CS
Survey Date Start: 2026-07-21
Survey Date End: 2026-07-21
Source Institution: DOD/USACE -- US Army Corps of Engineers San Francisco District
Bathymetry Coverage: True
Coverage: True
Significant Features: False
Feature Least Depth: N/A
Feature Size: N/A
Vertical Uncertainty
1m


nowcoast.noaa.gov
nowCOAST
Present
(-122.42° W , 37.83° N)
POINT FORECASTS
BLUETOPO
BLUETOPO
BlueTopo Data & Source Info
Elevation: -2.23m
Uncertainty: +/- 8.00m
Source Survey ID: NBS Generalization
Survey Date Start: 1807-02-10
Survey Date End: 1807-02-10
Source Institution: DOC/NOAA/NOS/OCS -- Office of Coast Survey
Bathymetry Coverage: False
Coverage: False
Significant Features: False
Feature Least Depth: False
Feature Size: N/A
Vertical Uncertainty Fixed: N/A
Vertical Uncertainty Variable: N/A


nowcoast.noaa.gov
nowCOAST
Present
(-122.48° W , 37.81° N)
POINT FORECASTS
BLUETOPO
BLUETOPO
BlueTopo Data & Source Info
Elevation: 20.49m
Uncertainty: +/- 1.00m
Source Survey ID: west_coast_2016_el_nino_dem_J133704
Survey Date Start: 2016-04-28
Survey Date End: 2016-05-28
Source Institution: DOC/NOAA/NOS/NGS/RSD -- Remote Se
Division
Bathymetry Coverage: True
Coverage: True
Significant Features: False



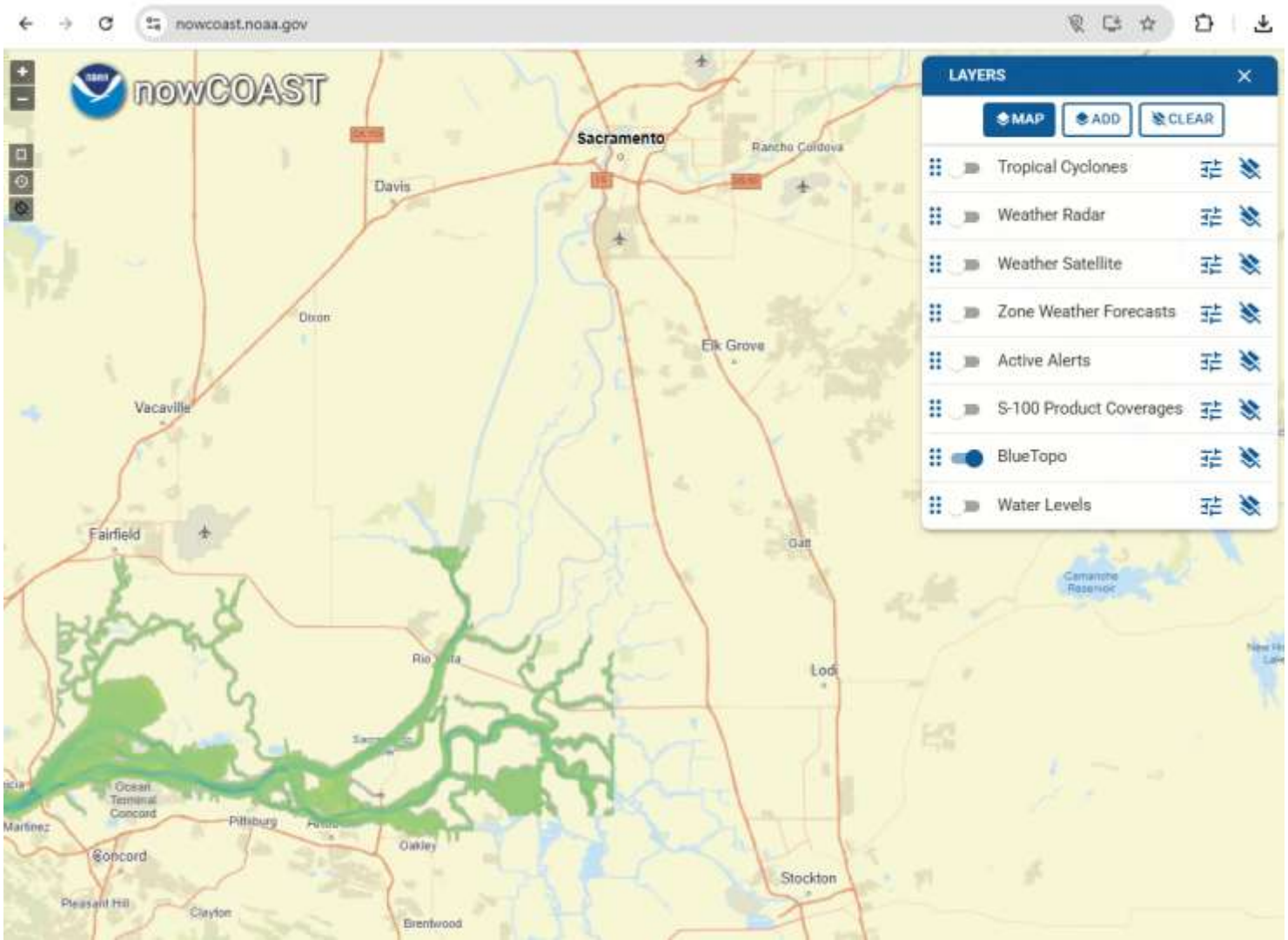
Present
(-122.34° W , 37.81° N)

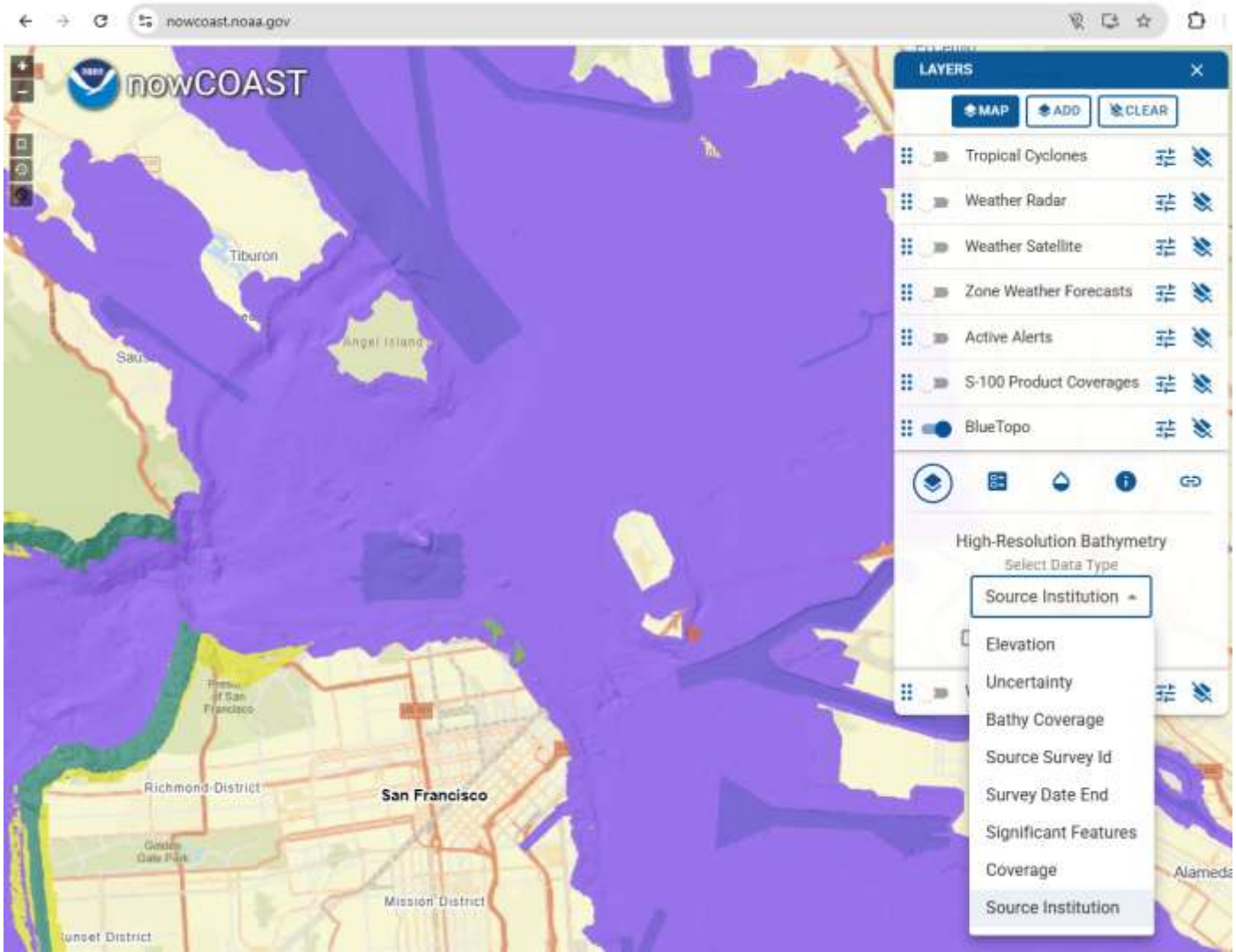
POINT FORECASTS | BLUETOPO

BLUETOPO

BlueTopo Data & Source Info

Elevation:	-3.71m
Uncertainty:	+/- 1.09m
Source Survey ID:	H07622.interpolated
Survey Date Start:	1947-01-01
Survey Date End:	1947-01-01
Source Institution:	DOC/NOAA/NOS/OCS -- Office of Coast Survey
Bathymetry Coverage:	False
Coverage:	False
Significant Features:	False
Feature Least Depth:	N/A
Feature Size:	N/A
Vertical Uncertainty Fixed:	1m


nowcoast.noaa.gov
nowCOAST
LAYERS
MAP
ADD
CLEAR
Tropical Cyclones
Weather Radar
Weather Satellite
Zone Weather Forecasts
Active Alerts
S-100 Product Coverages
BlueTopo
Water Levels
Sacramento
Davis
Rancho Cordova
Dixon
Elk Grove
Vacaville
Fairfield
Galt
Lodi
Stockton
Oakley
Pittsburg
Martinez
Concord
Pleasant Hill
Clayton
Brentwood


nowcoast.noaa.gov
nowCOAST
LAYERS
MAP
ADD
CLEAR
Tropical Cyclones
Weather Radar
Weather Satellite
Zone Weather Forecasts
Active Alerts
S-100 Product Coverages
BlueTopo
High-Resolution Bathymetry
Select Data Type
Source Institution
Elevation
Uncertainty
Bathy Coverage
Source Survey Id
Survey Date End
Significant Features
Coverage
Source Institution
Tiburon
Angel Island
San Francisco
Richmond District
Mission District
Alameda

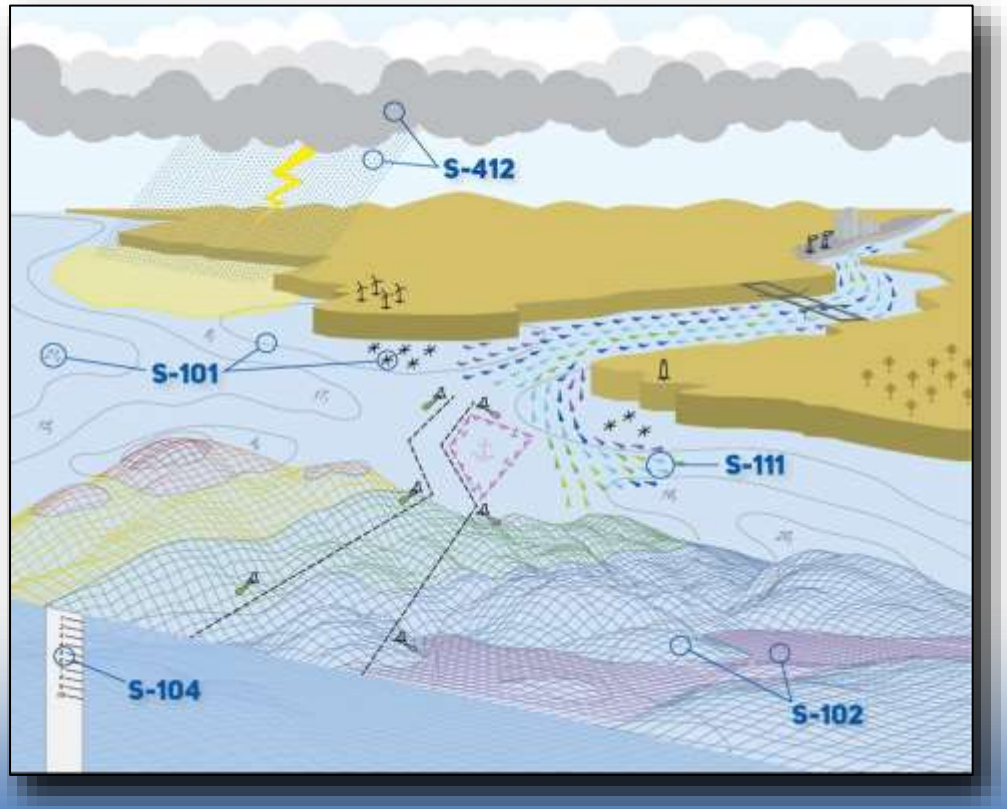
BlueTopo NOT FOR NAVIGATION

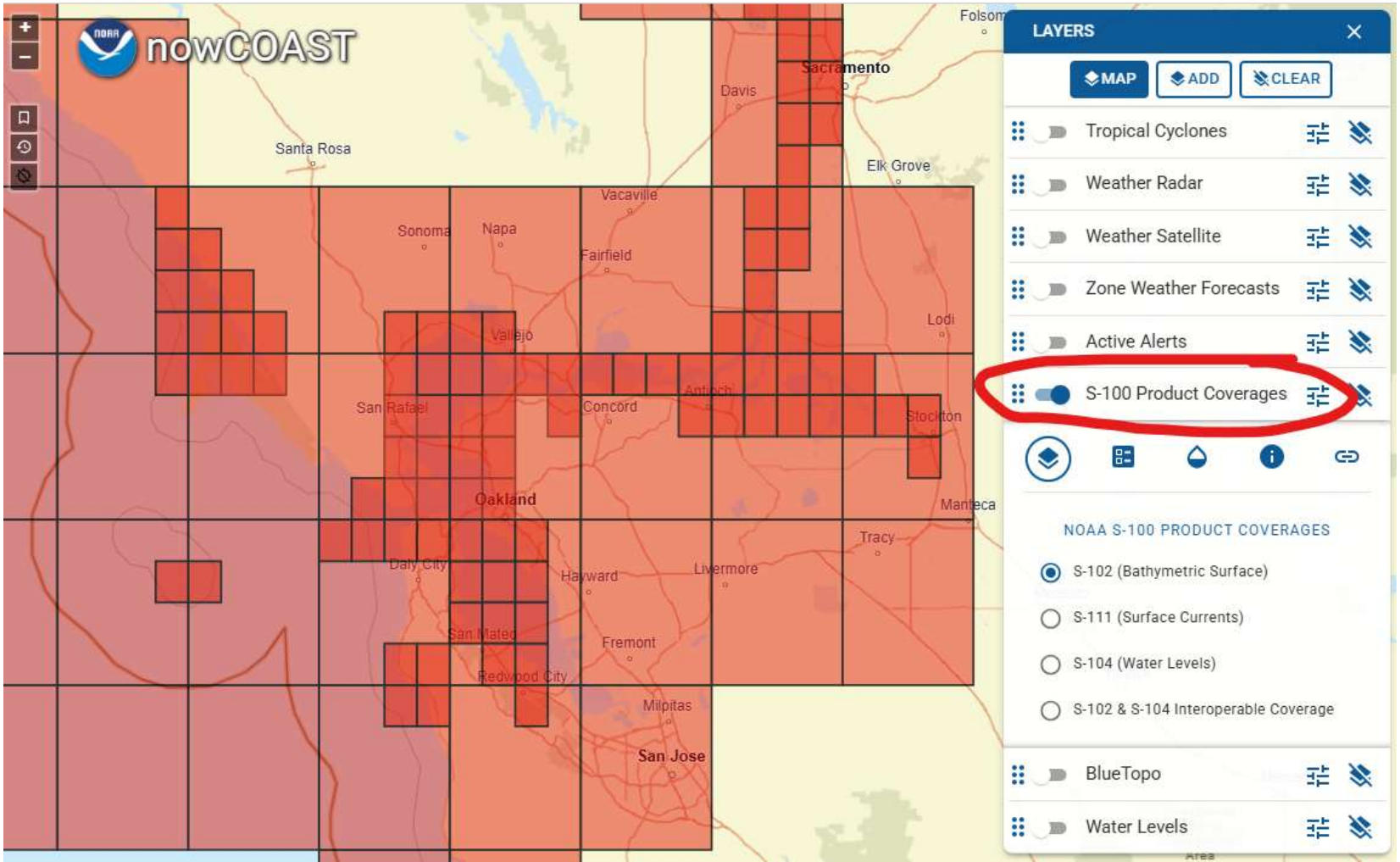
- Vertical Datum is not Chart Datum
  - The vertical datum is North American Vertical Datum 1988 (NAVD88)
    - Datum difference at SF gage about one inch
    - Datum difference at Port Chicago about a foot
    - Datum difference at Port of Sacramento about 2 feet
- Be wary of data on shore or nearshore.
  - "NBS Generalization" Survey Date of "1807"
    - Not "real" data, but interpolated/generalized
  - Some areas may be from really old surveys

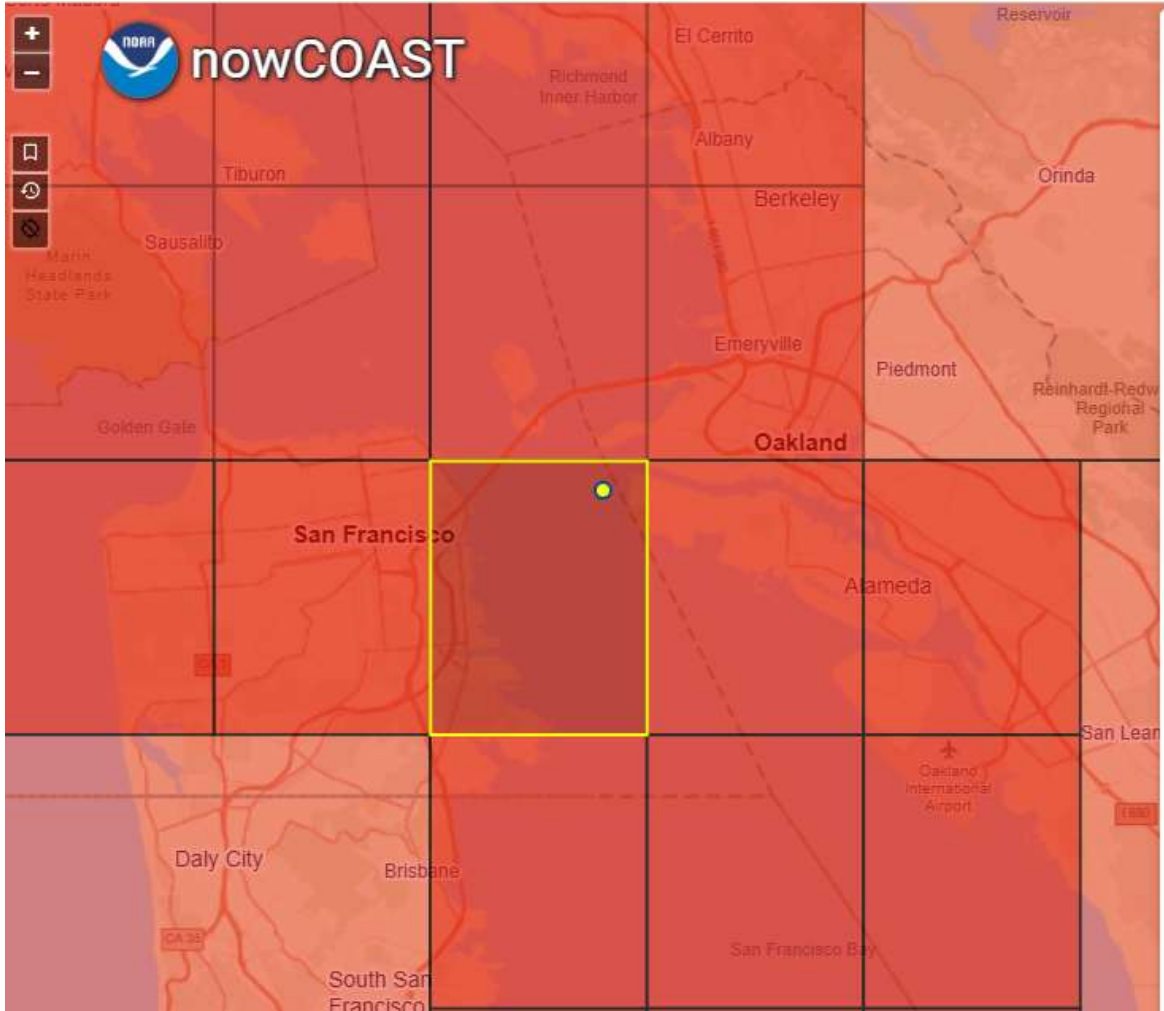
S-100 Data Framework

S-100 Data Products

- **S-101**: Electronic Navigational Charts (ENC)
- **S-102:** Bathymetric Surface
- **S-104:** Water Level Information
- **S-111:** Surface Currents
- **S-41X:** Weather Overlays




nowcoast.noaa.gov
nowCOAST
LAYERS
MAP
ADD
CLEAR
Tropical Cyclones
Weather Radar
Weather Satellite
Zone Weather Forecasts
Active Alerts
S-100 Product Coverages
NOAA S-100 PRODUCT COVERAGES
S-102 (Bathymetric Surface)
S-111 (Surface Currents)
S-104 (Water Levels)
S-102 & S-104 Interoperable Coverage
BlueTopo
Water Levels
Folsom
Sacramento
Davis
Elk Grove
Santa Rosa
Vacaville
Sonoma
Napa
Fairfield
Lodi
Vallejo
Antioch
San Rafael
Concord
Stockton
Oakland
Manteca
Tracy
Daly City
Hayward
Livermore
San Mateo
Fremont
Redwood City
Milpitas
San Jose



Present
(-122.34° W , 37.79° N)

POINT FORECASTS | S100

Precision Marine Navigation

NOAA S-100 Product Coverages

S-102 DATA (TILE ID: US4CA2BK)

S-102 DATA (TILE ID: US5OAKEH)

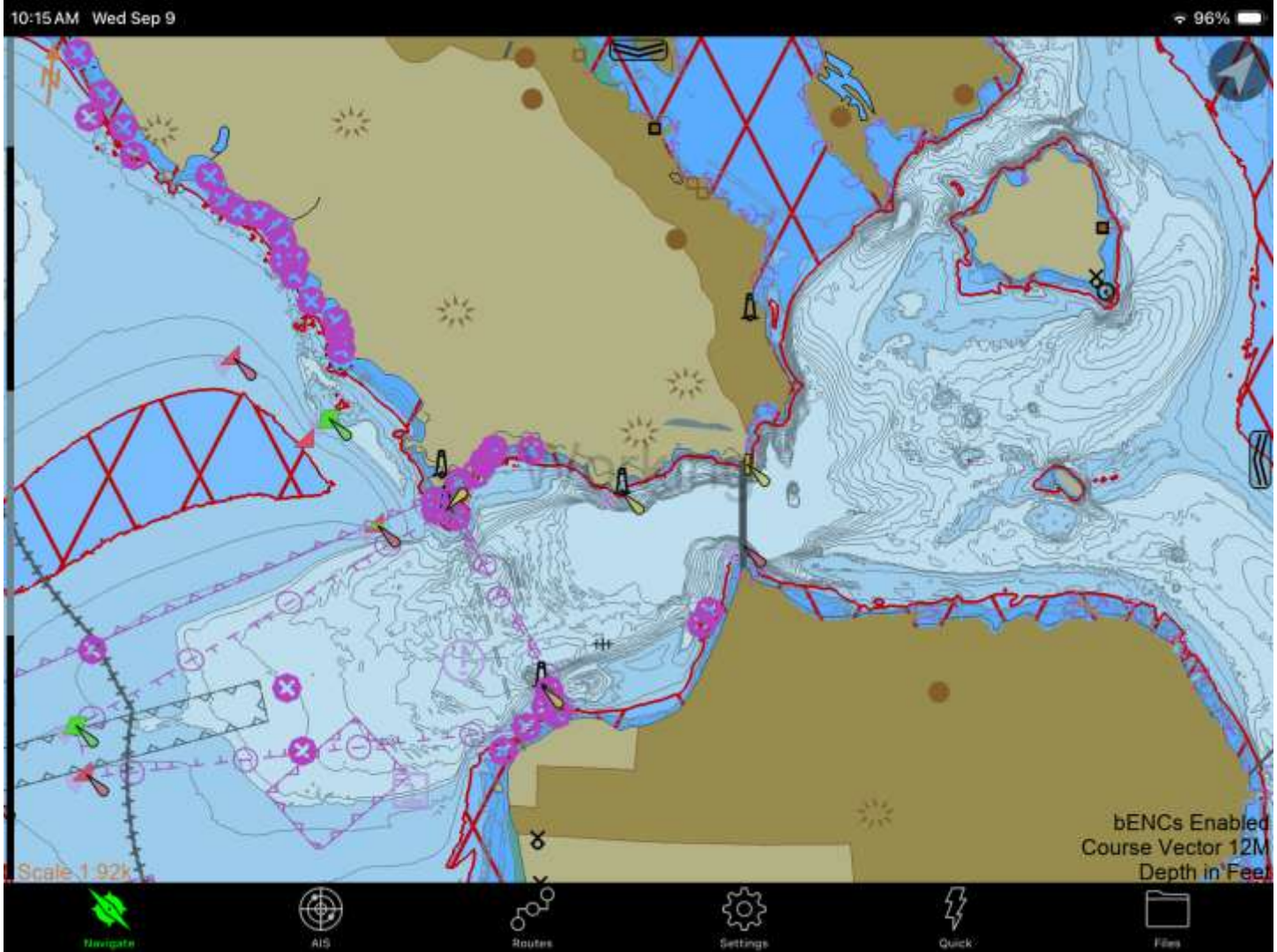
Product Name:	Bathymetric Surface
Product Version:	S-102 Ed.3.0.0
Product Issuance:	2026-08-26 17:57:28+00:00
Data Directory:	S-102 Datasets
How to Access Data:	S-102 Access Guide
Overview:	S-102 Overview
Direct File Download:	102US005OAKEH262227.h5
Direct Catalog Download:	S-102 Catalog
Access Region:	California, San Francisco
Horizontal Resolution:	4.0 m
S-100 Purpose:	newDataset
Edition Number:	1
Navigation Purpose:	port

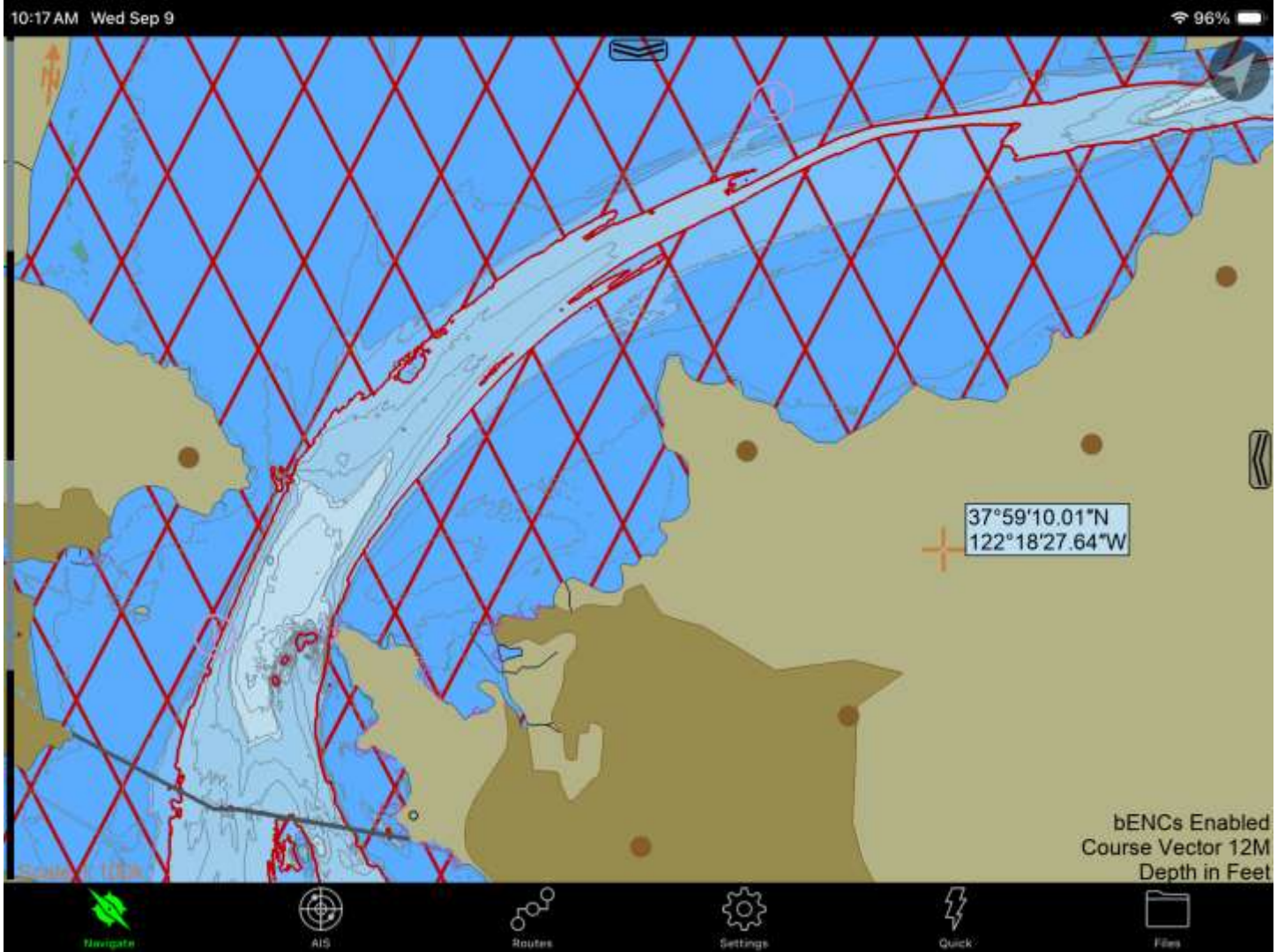

9:45 AM Wed Sep 9
100%
V-AIS
clr 203.7ft
3ft
bENCs Enabled
Course Vector 12M
Depth in Feet
Scale 1:17k
Navigate
AIS
Routes
Settings
Quick
Files


9:49 AM Wed Sep 9
100%
V-AIS
clr 203.7ft
37°47'28.67"N
122°21'00.49"W
S-102: Depth: 39.37ft (MLLW)
S-102: Min Depth: 29.86ft (MLLW)
S-102: Survey: 01/05/22-03/04/22
bENCs Enabled
Course Vector 12M
Depth in Feet
Navigate
AIS
Routes
Settings
Quick
Files


9:49 AM Wed Sep 9
100%
V-AIS
clr 203.7ft
3ft
37°48'14.44"N
122°20'50.67"W
S-102: Depth: 48.79ft (MLLW)
S-102: Min Depth: 47.87ft (MLLW)
S-102: Survey: 05/12/26
bENCs Enabled
Course Vector 12M
Depth in Feet
Scale 1:17k (Overscale ×0.4)
Navigate
AIS
Routes
Settings
Quick
Files


10:07 AM Wed Sep 9
98%
bENCs Enabled
Course Vector 12M
Depth in Feet
Scale 1:16k (Overscale ×1.2)
Navigate
AIS
Routes
Settings
Quick
Files

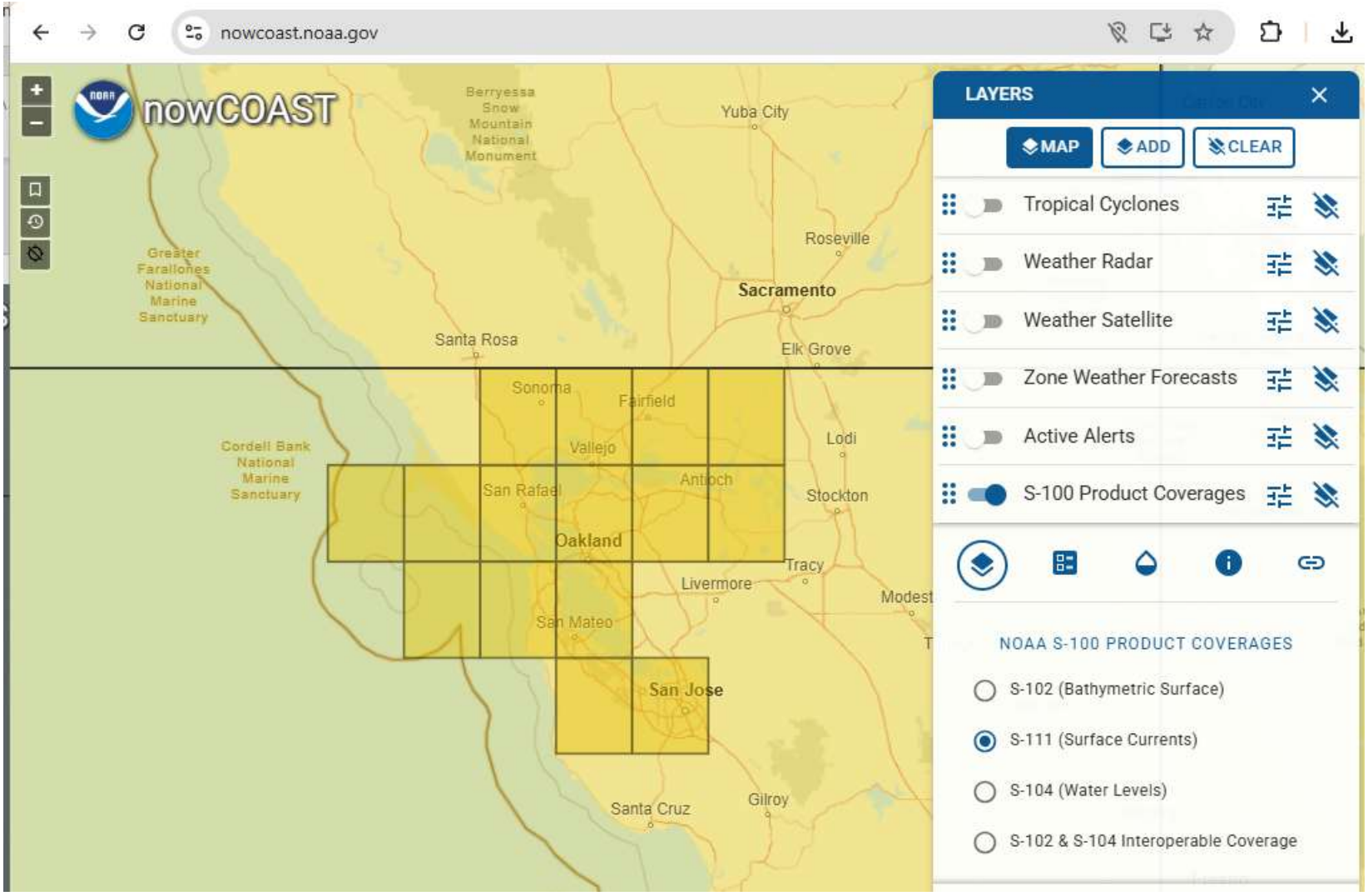

10:15 AM Wed Sep 9
96%
bENCs Enabled
Course Vector 12M
Depth in Feet
Scale 1:92k
Navigate
AIS
Routes
Settings
Quick
Files


10:17 AM Wed Sep 9
96%
37°59'10.01"N
122°18'27.64"W
bENCs Enabled
Course Vector 12M
Depth in Feet
Navigate
AIS
Routes
Settings
Quick
Files


8:42 AM Tue Sep 15
86%
38°33'47.18"N
121°33'04.85"W
S-102: Depth: 36.06ft (MLLW)
S-102: Min Depth: 34.48ft (MLLW)
S-102: Survey: 01/05/26
clr 139.8ft
bENCs Enabled
Course Vector 12M
Depth in Feet
Navigate
AIS
Routes
Settings
Quick
Files


8:40 AM Tue Sep 15
86%
37°57'08.75"N
121°19'08.54"W
S-102: Depth: 37.50ft (MLLW)
S-102: Min Depth: 34.94ft (MLLW)
S-102: Survey: 01/02/26
bENCs Enabled
Course Vector 12M
Depth in Feet
Navigate
AIS
Routes
Settings
Quick
Files


nowCOAST
Ottawa
Toronto
UNITED
STATES
Phoenix
MEXICO
BAHAMAS
CUBA
Mexico
City
Kingston
HAITI


nowcoast.noaa.gov
nowCOAST
Berryessa Snow Mountain National Monument
Yuba City
Roseville
Greater Farallones National Marine Sanctuary
Sacramento
Santa Rosa
Elk Grove
Sonoma
Fairfield
Vallejo
Lodi
Cordell Bank National Marine Sanctuary
San Rafael
Antioch
Stockton
Oakland
Tracy
Livermore
Modesto
San Mateo
San Jose
Santa Cruz
Gilroy
LAYERS
MAP
ADD
CLEAR
Tropical Cyclones
Weather Radar
Weather Satellite
Zone Weather Forecasts
Active Alerts
S-100 Product Coverages
NOAA S-100 PRODUCT COVERAGES
S-102 (Bathymetric Surface)
S-111 (Surface Currents)
S-104 (Water Levels)
S-102 & S-104 Interoperable Coverage


10:39 AM Wed Sep 9
93%
V-AIS
clr 203.7ft
V-AIS
clr 219.8ft
S-111 (Grid)
Time: 10:00 09/09
Current: 156°T @ 1.4kn↓
Slack @ 12:29
Reverse @ 15:00
bENCs Enabled
Course Vector 12M
Depth in Feet
Scale 1:16k (Overscale 1.2)
Navigate
AIS
Routes
Settings
Quick
Files


10:40 AM Wed Sep 9
93%
V-AIS
clr 203.7ft
V-AIS
clr 219.8ft
37°47'35.64"N
122°21'15.51"W
S-102: Depth: 46.85ft (MLLW)
S-102: Min Depth: 40.22ft (MLLW)
S-102: Survey: 01/05/22-03/04/22
S-111: Current: 158°T @ 1.5kn↓
Scale 1:16k (Overscale x1.2)
bENCs Enabled
Course Vector 12M
Depth in Feet
Navigate
AIS
Routes
Settings
Quick
Files

S-100 and the IMO

- In 2022, the International Maritime Organization (IMO), amended its Electronic Chart Display and Information System (ECDIS) standard to leverage S-100 based ENCs beginning in 2026.
- S-100 ECDIS will be voluntary starting **1 January 2026**
- From **1 January 2029** new systems must comply with the new IMO Resolution on ECDIS Performance Standards (MSC.530(106))


Jeffrey Ferguson
jeffrey.ferguson@noaa.gov
301.351.7798