Russian River Estuary Management Project 2017 Review and 2018 Update

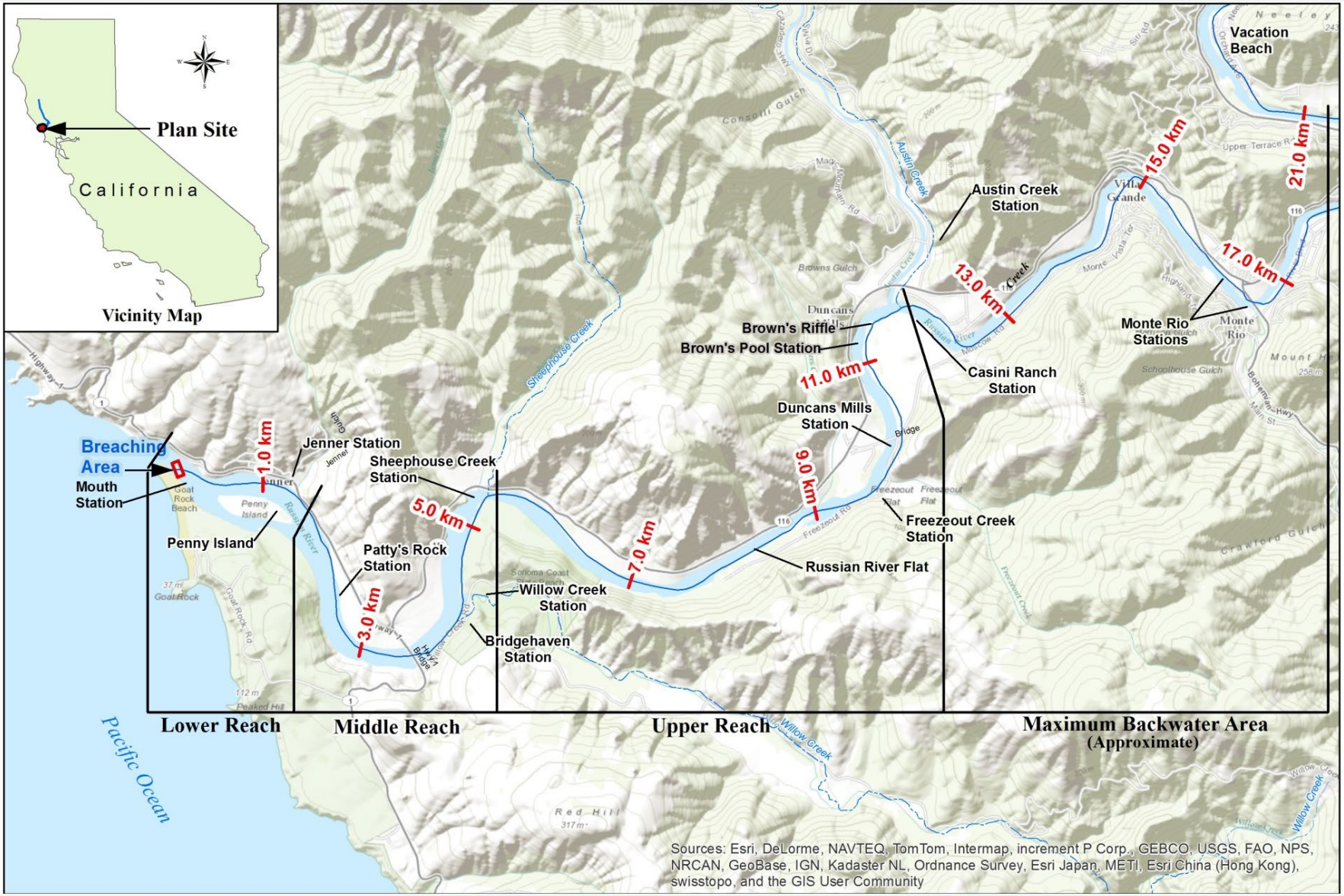
Jessica Martini-Lamb

Environmental Resources Manager

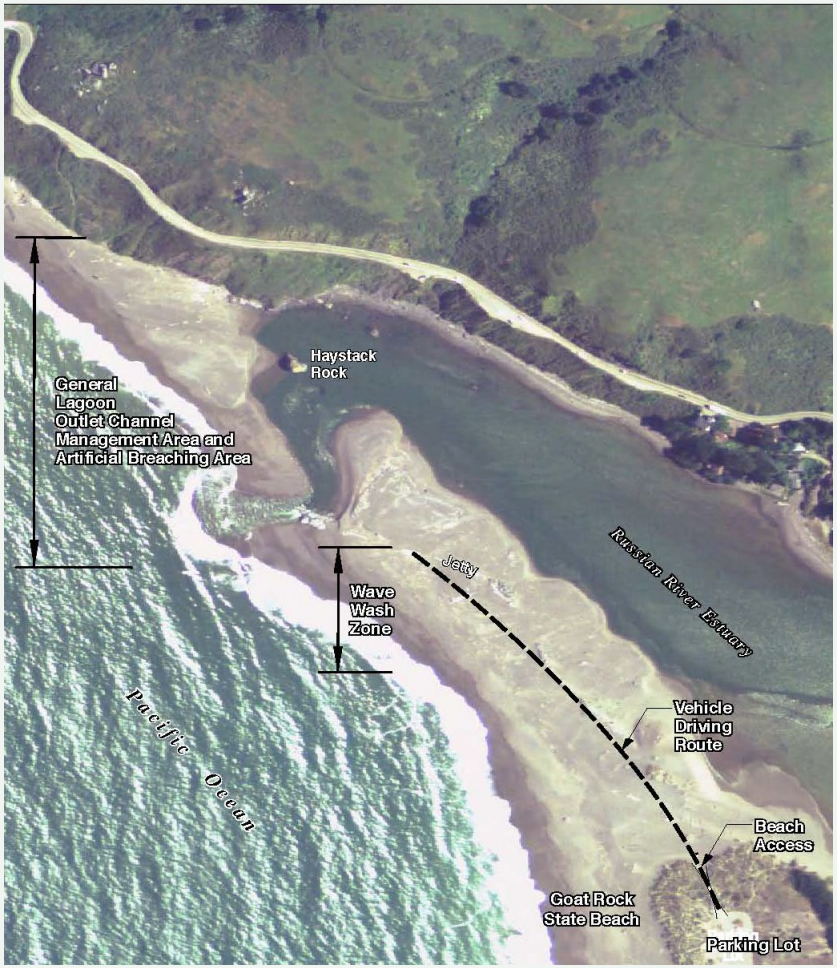
jessicam@scwa.ca.gov

SONOMA COUNTY WATER AGENCY

Project Summary



Beach Management Activities



Artificial breach

Outlet channel

Estuary Management Project Status

- 4 closures during 2017 lagoon mgt. season
  - 2 outlet channel attempts

July 17

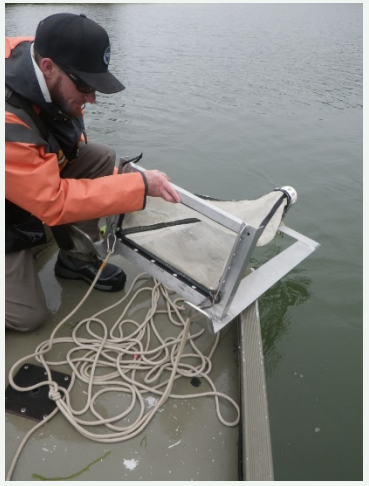
October 3

Estuary Monitoring

- Fisheries: downstream migrant trapping, seining, PIT-tag antennas
- Invertebrates and prey availability
- Pinnipeds
- Water quality
- Beach topography

2018 Estuary Activities

- Adaptive Management Plan
- Continue to monitor biological and water quality conditions



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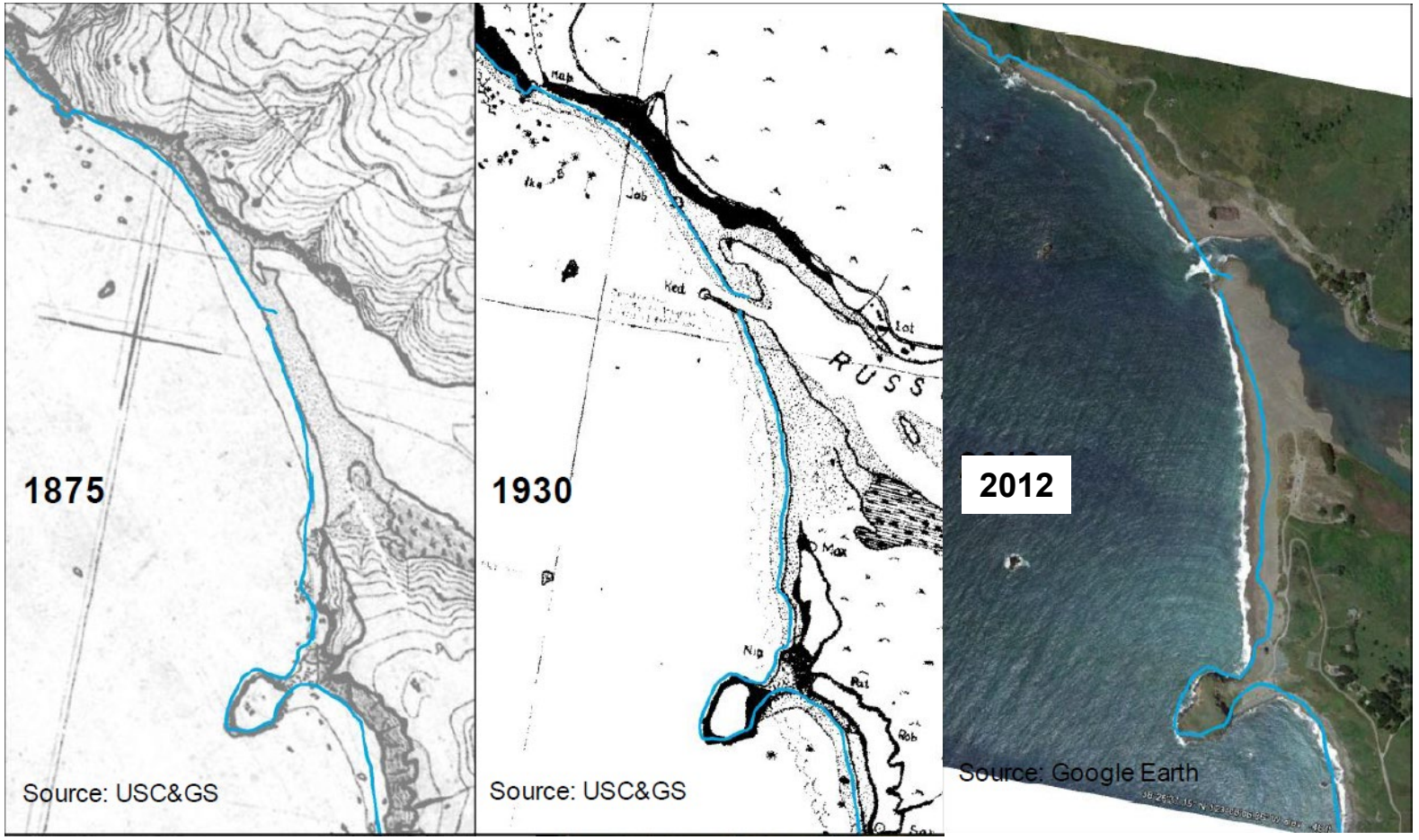
SONOMA COUNTY WATER AGENCY

Beach Morphology at Goat Rock

Dane Behrens
DBehrens@esassoc.com

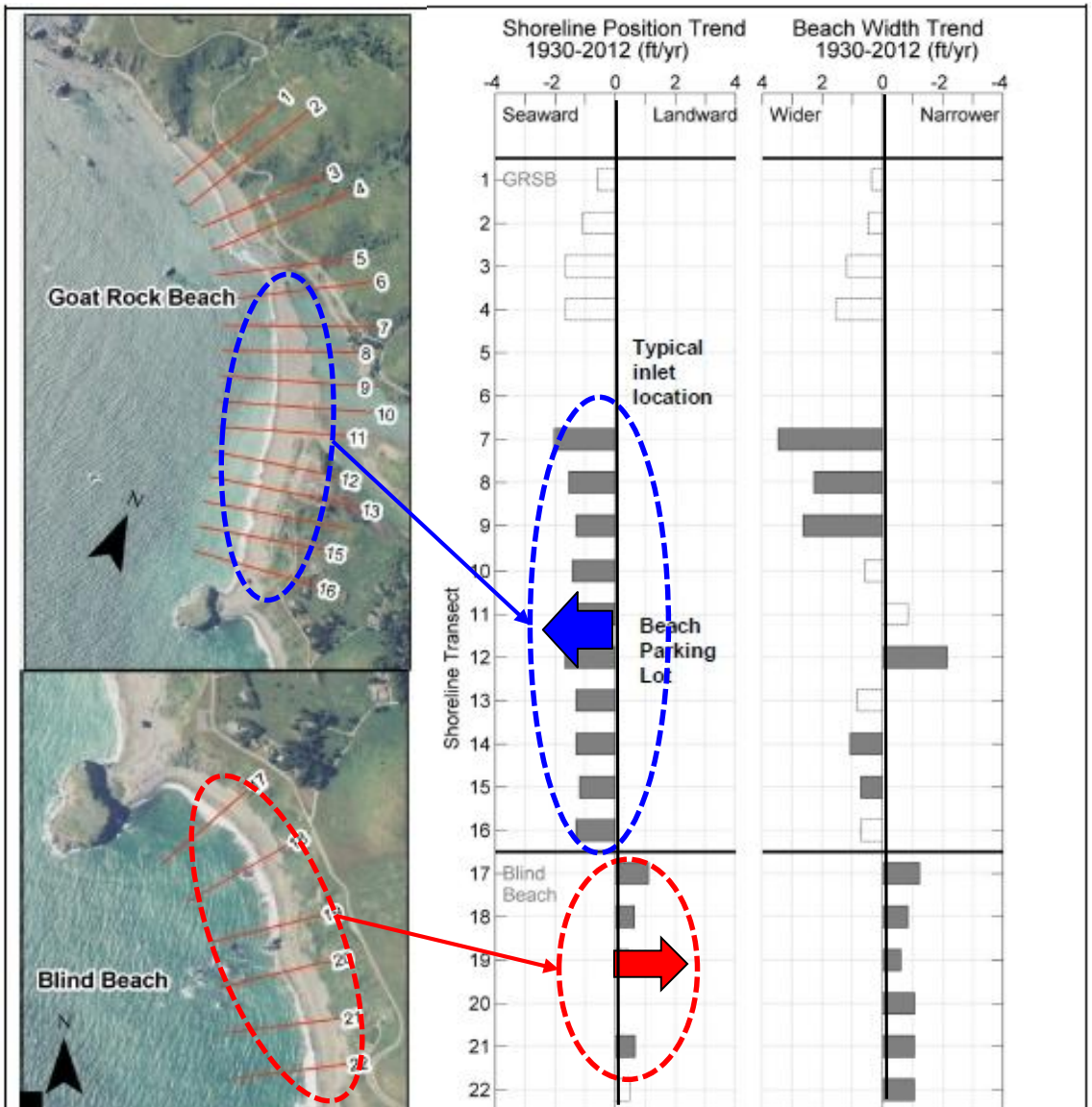
Beach Morphology: Influence of Construction Adjacent to Goat Rock



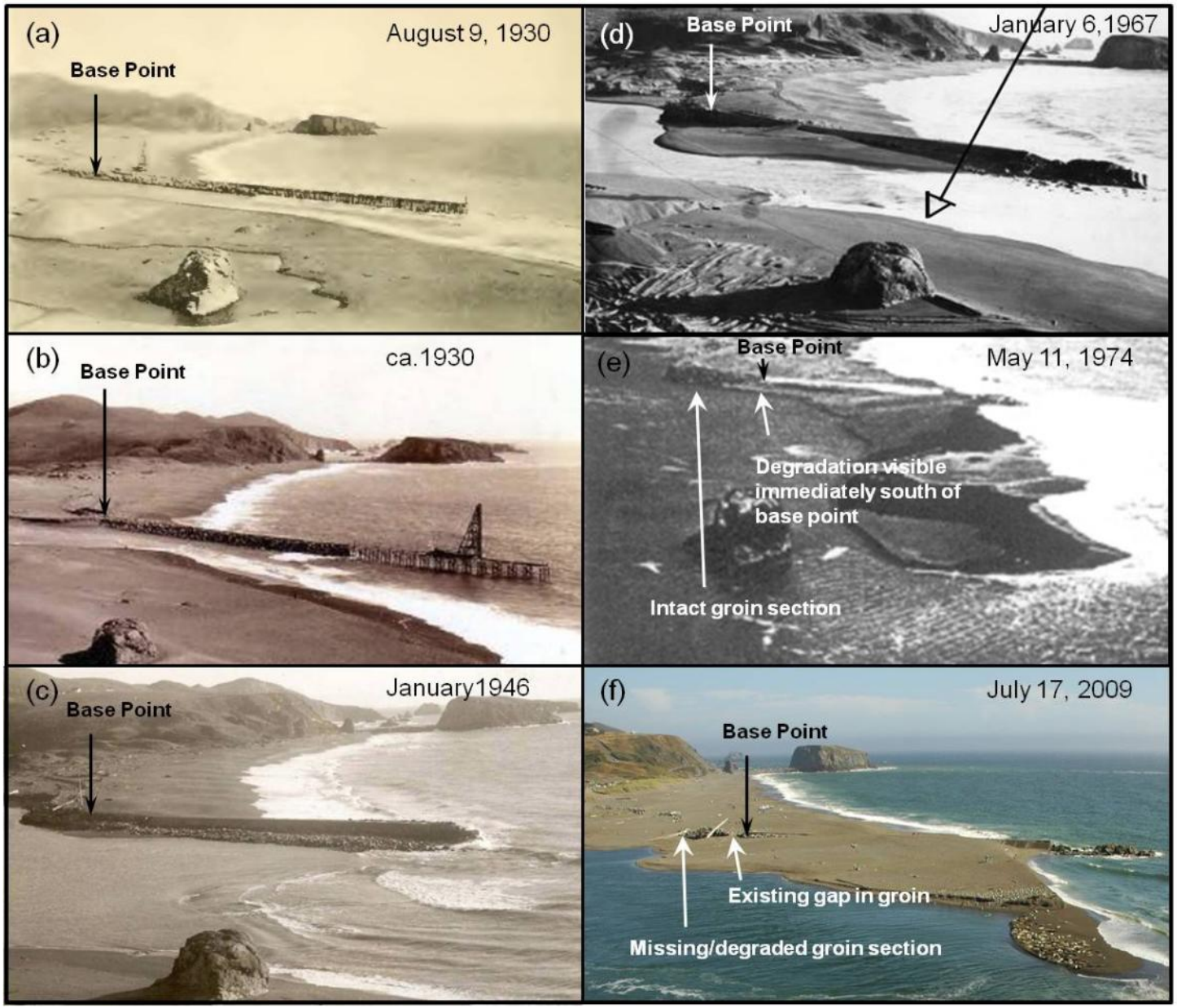
- Goat Rock previously connected to the shore at low tide
- Shoreline ***growing*** 1.5 feet per year since 1930.

Beach Morphology:

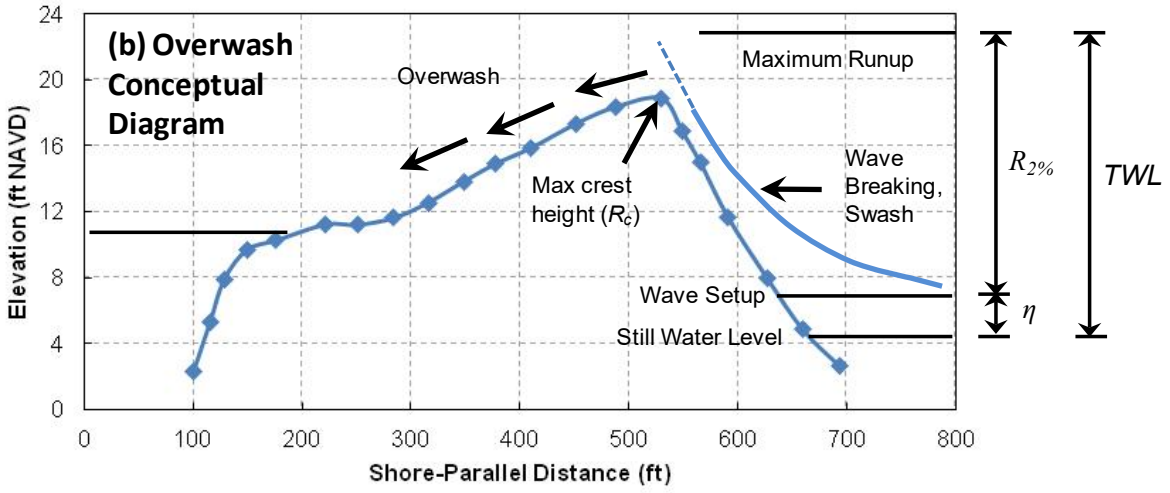
Influence of Goat Rock Parking Lot



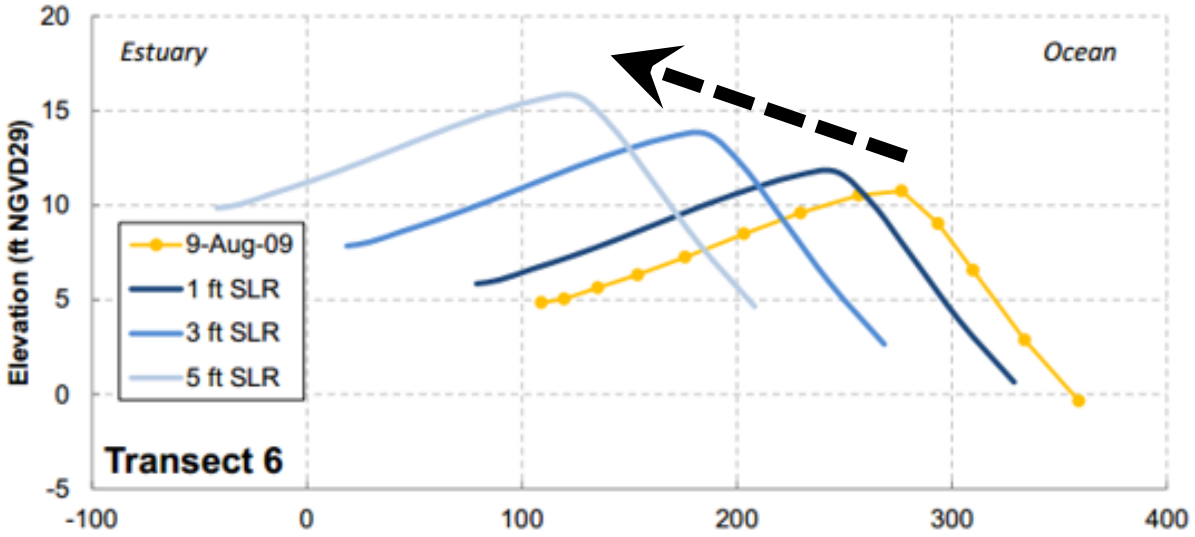
Evolution of the Back Beach



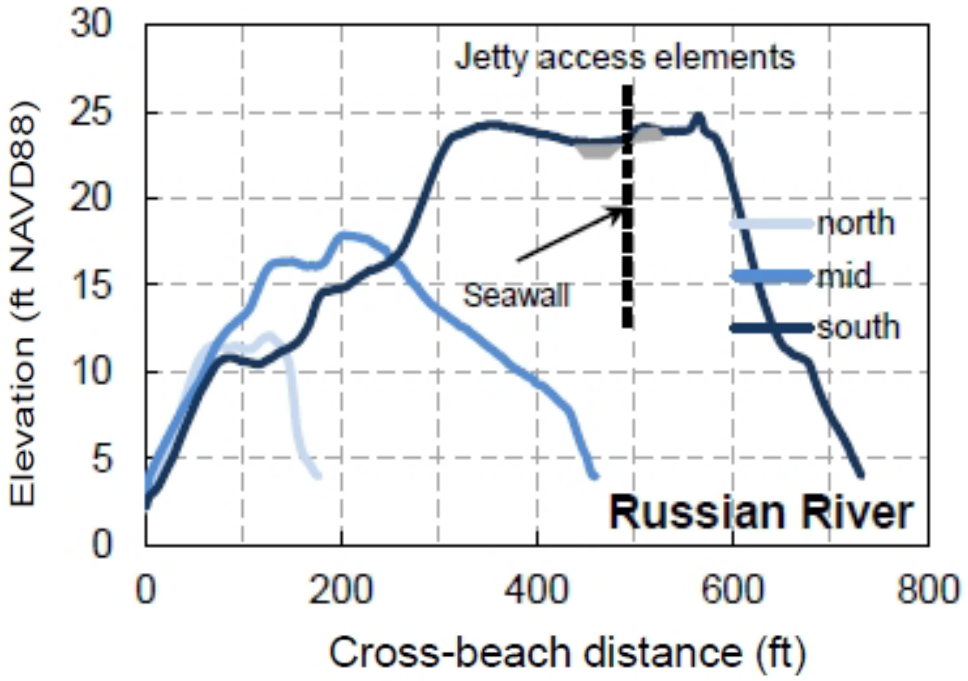
Beach Morphology: Influence of Jetty on Overwash



Beach Morphology: Response to Sea Level Rise



Jetty Components



Beach Morphology at Goat Rock

Dane Behrens
DBehrens@esassoc.com

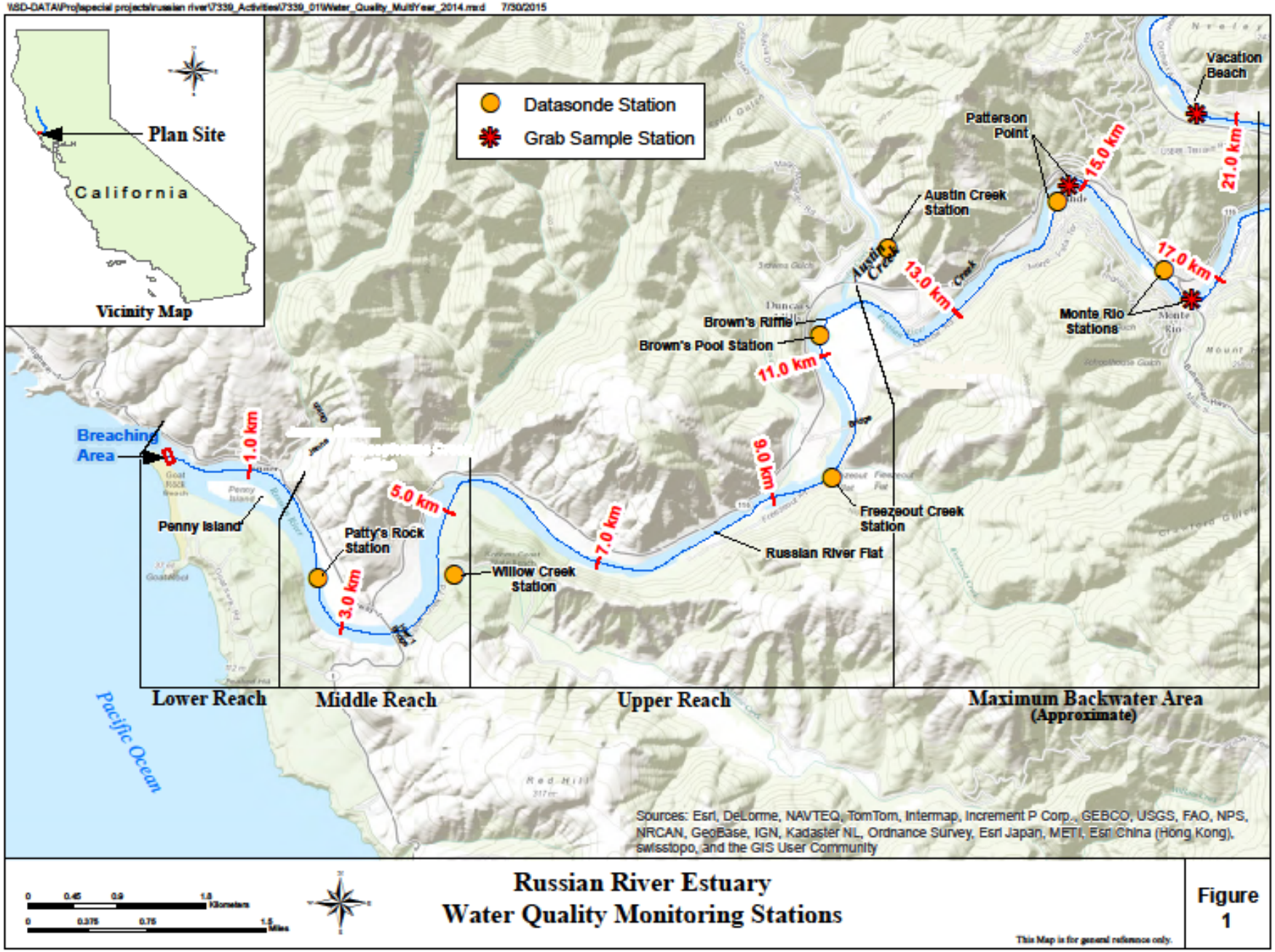
2017 Lower Russian River and Estuary Water Quality Monitoring

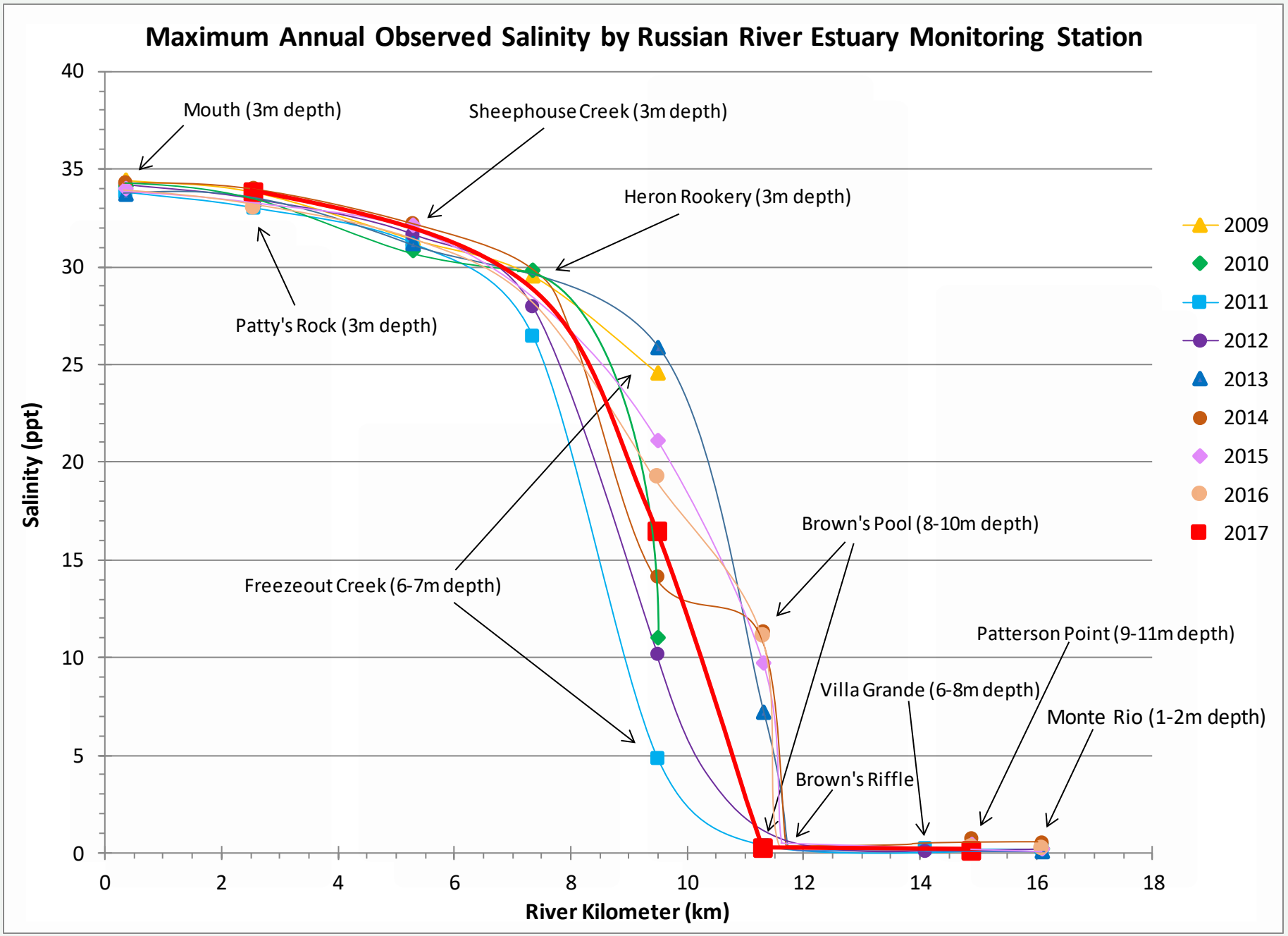
Jeff Church

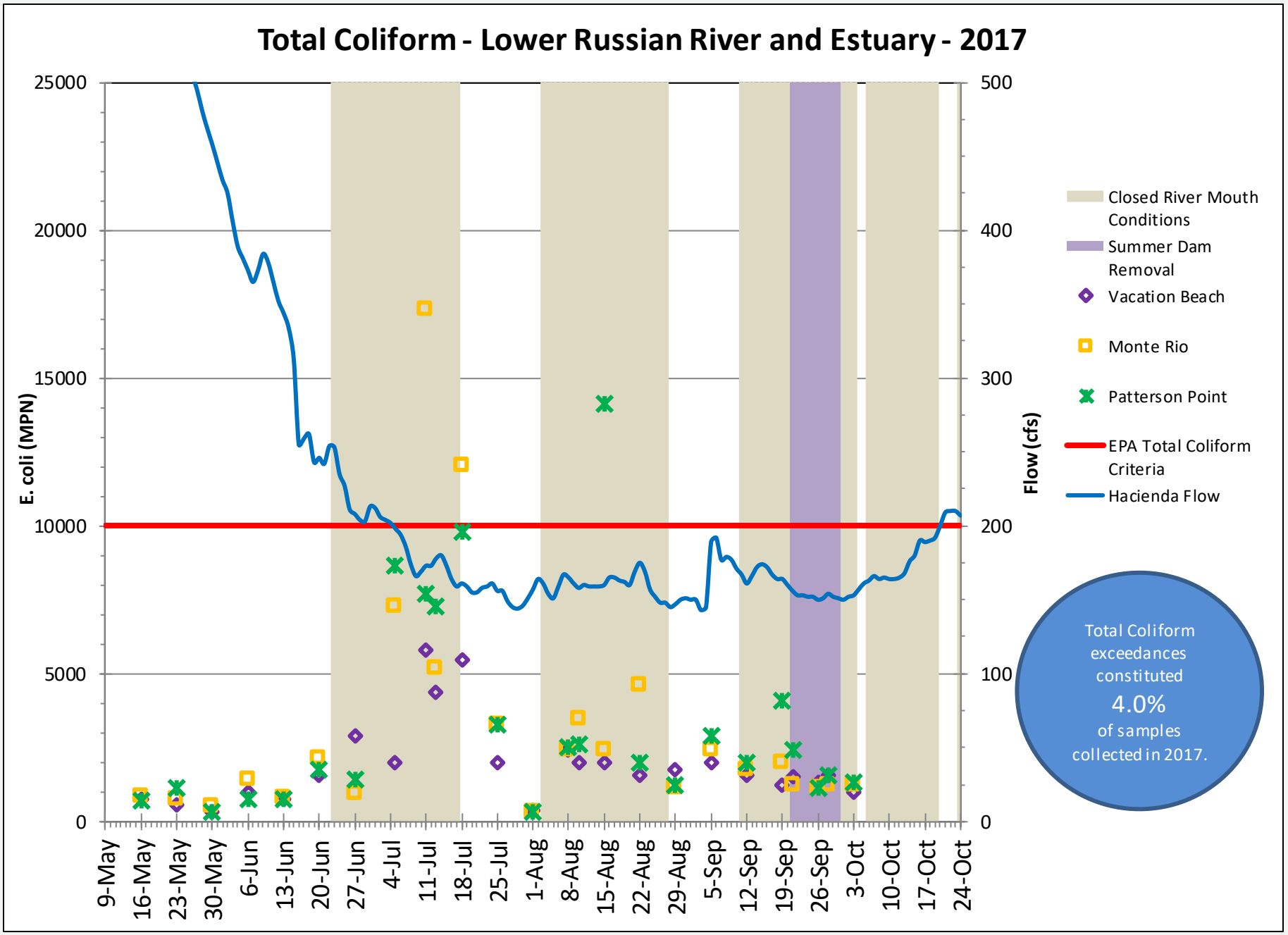
Senior Environmental Specialist

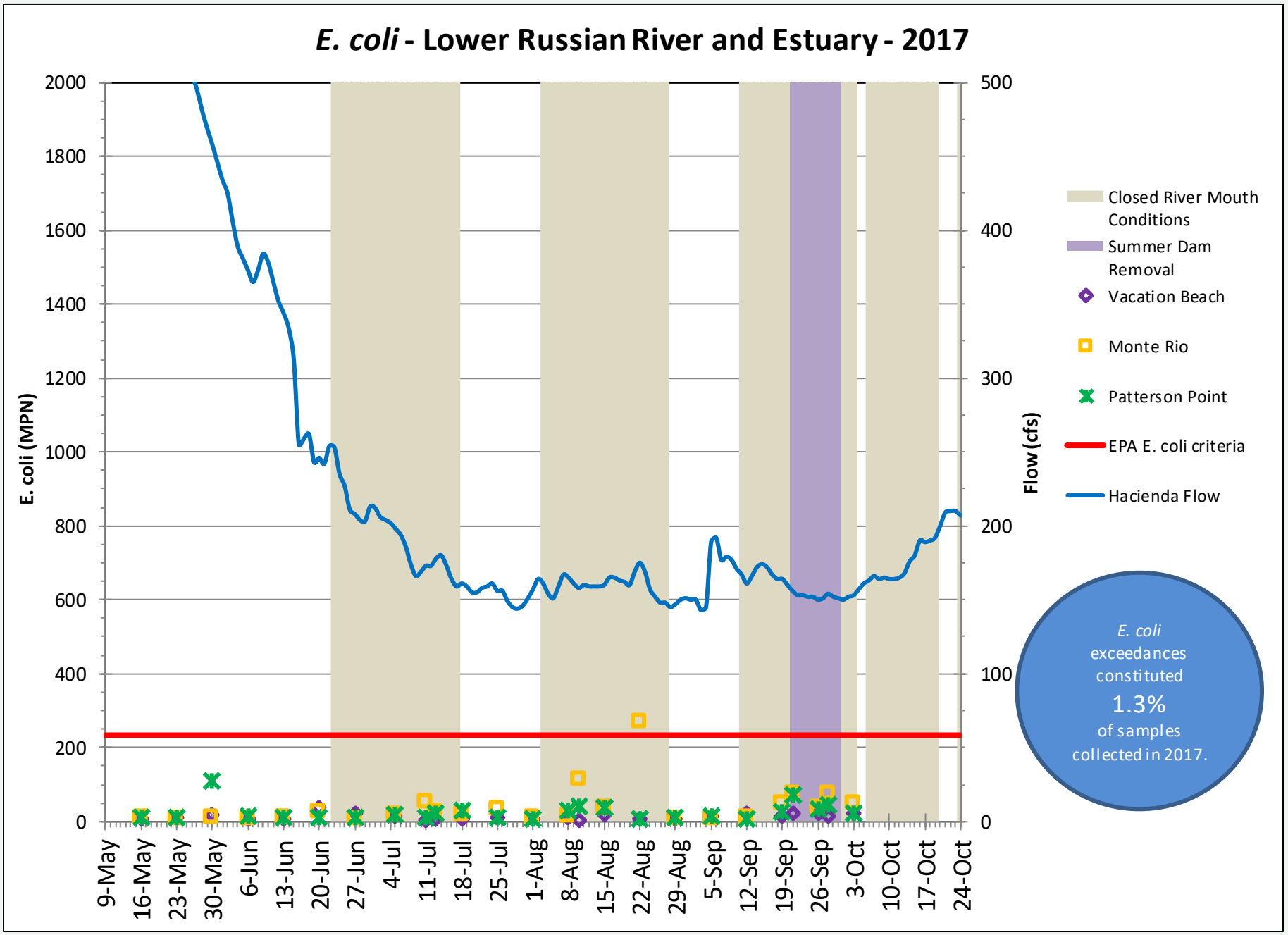
jchurch@scwa.ca.gov

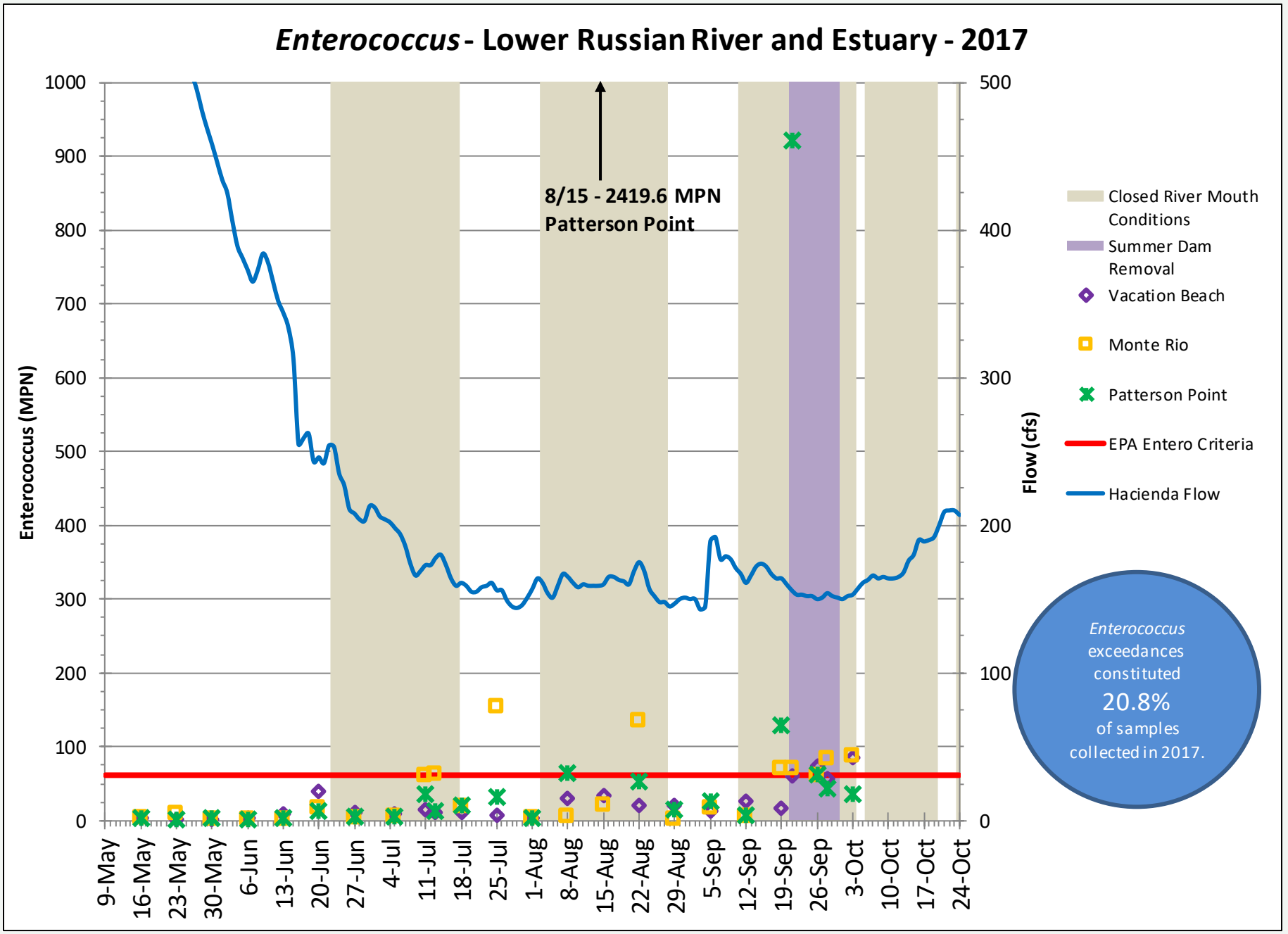
SONOMA COUNTY WATER AGENCY

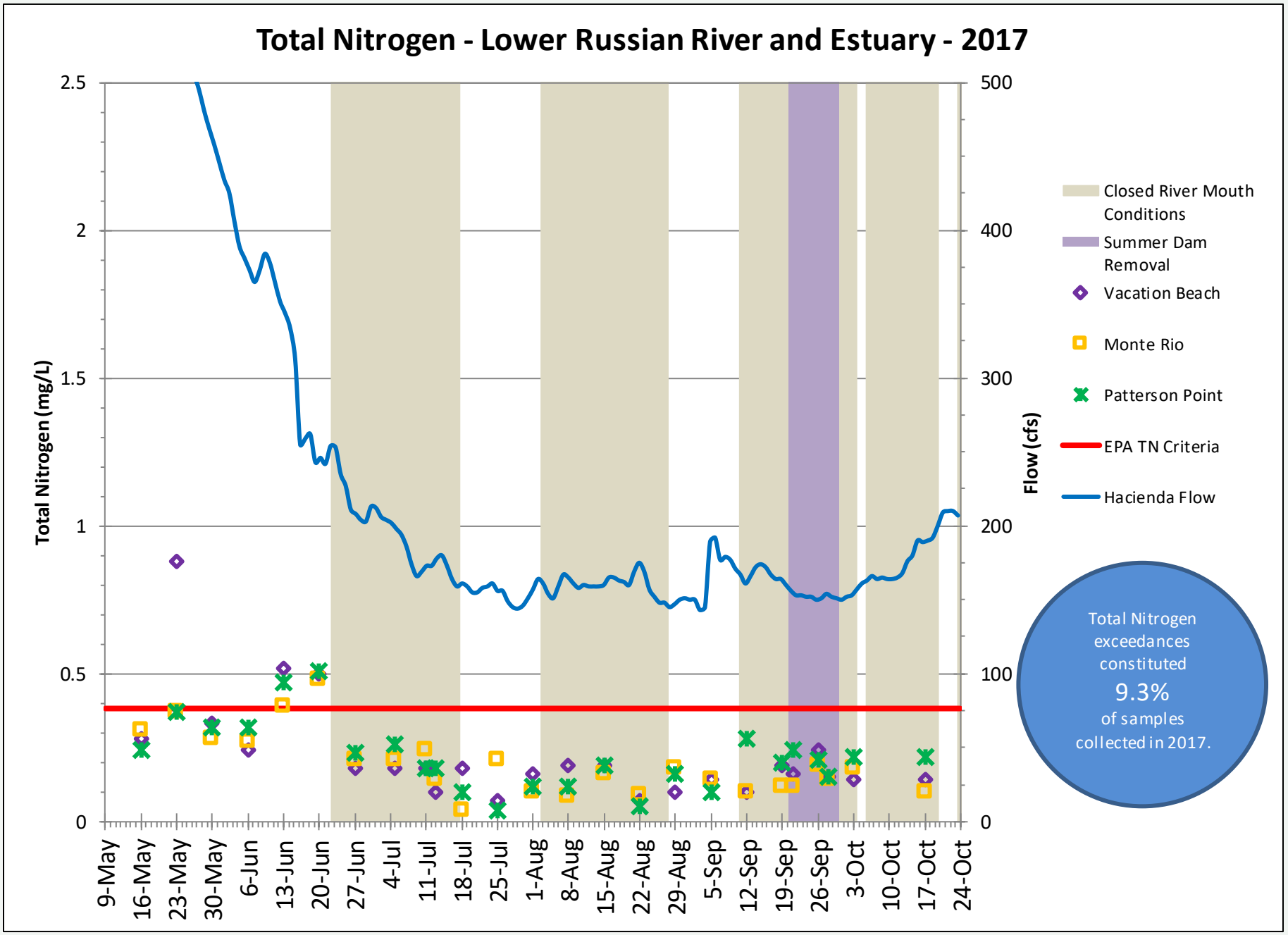

W:\SD-DATA\Proj\special projects\russian river\7339_Activities\7339_01\Water_Quality_MultiYear_2014.mxd 7/30/2015
Plan Site
California
Vicinity Map
Datasonde Station
Grab Sample Station
Vacation Beach
Patterson Point
15.0 km
21.0 km
Austin Creek Station
Austin Creek
13.0 km
17.0 km
Monte Rio Stations
Brown's Riffle
Brown's Pool Station
11.0 km
Breaching Area
1.0 km
9.0 km
5.0 km
7.0 km
Penny Island
Patty's Rock Station
3.0 km
Willow Creek Station
Freezeout Creek Station
Russian River Flat
Pacific Ocean
Lower Reach
Middle Reach
Upper Reach
Maximum Backwater Area
(Approximate)
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community
0 0.45 0.9 1.8 Kilometers
0 0.375 0.75 1.5 Miles
Russian River Estuary
Water Quality Monitoring Stations
This Map is for general reference only.
Figure 1

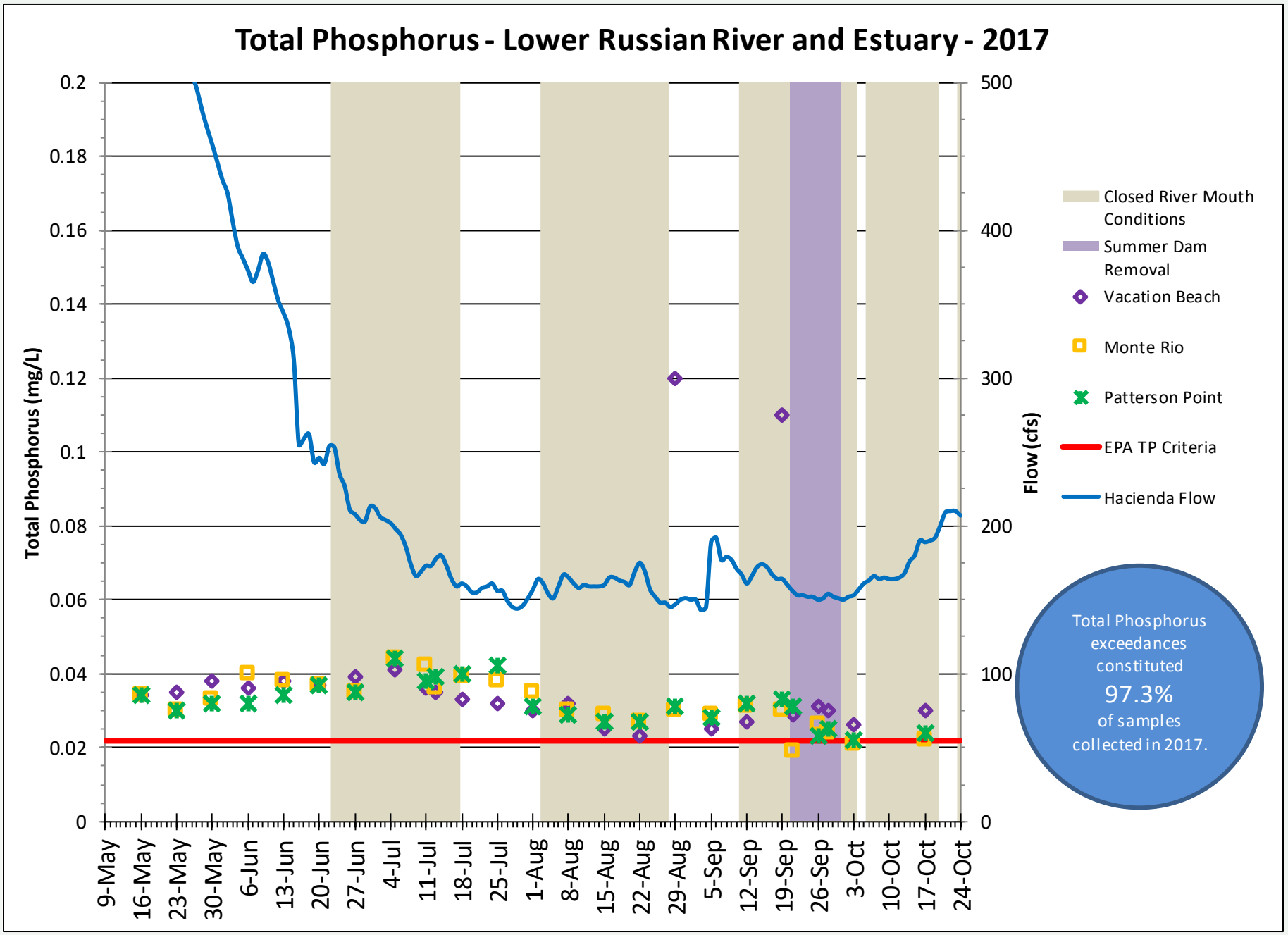

Maximum Annual Observed Salinity by Russian River Estuary Monitoring Station
Salinity (ppt)
River Kilometer (km)
0
5
10
15
20
25
30
35
40
0
2
4
6
8
10
12
14
16
18
Mouth (3m depth)
Sheephouse Creek (3m depth)
Heron Rookery (3m depth)
Patty's Rock (3m depth)
Freezeout Creek (6-7m depth)
Brown's Pool (8-10m depth)
Patterson Point (9-11m depth)
Villa Grande (6-8m depth)
Monte Rio (1-2m depth)
Brown's Riffle
2009
2010
2011
2012
2013
2014
2015
2016
2017

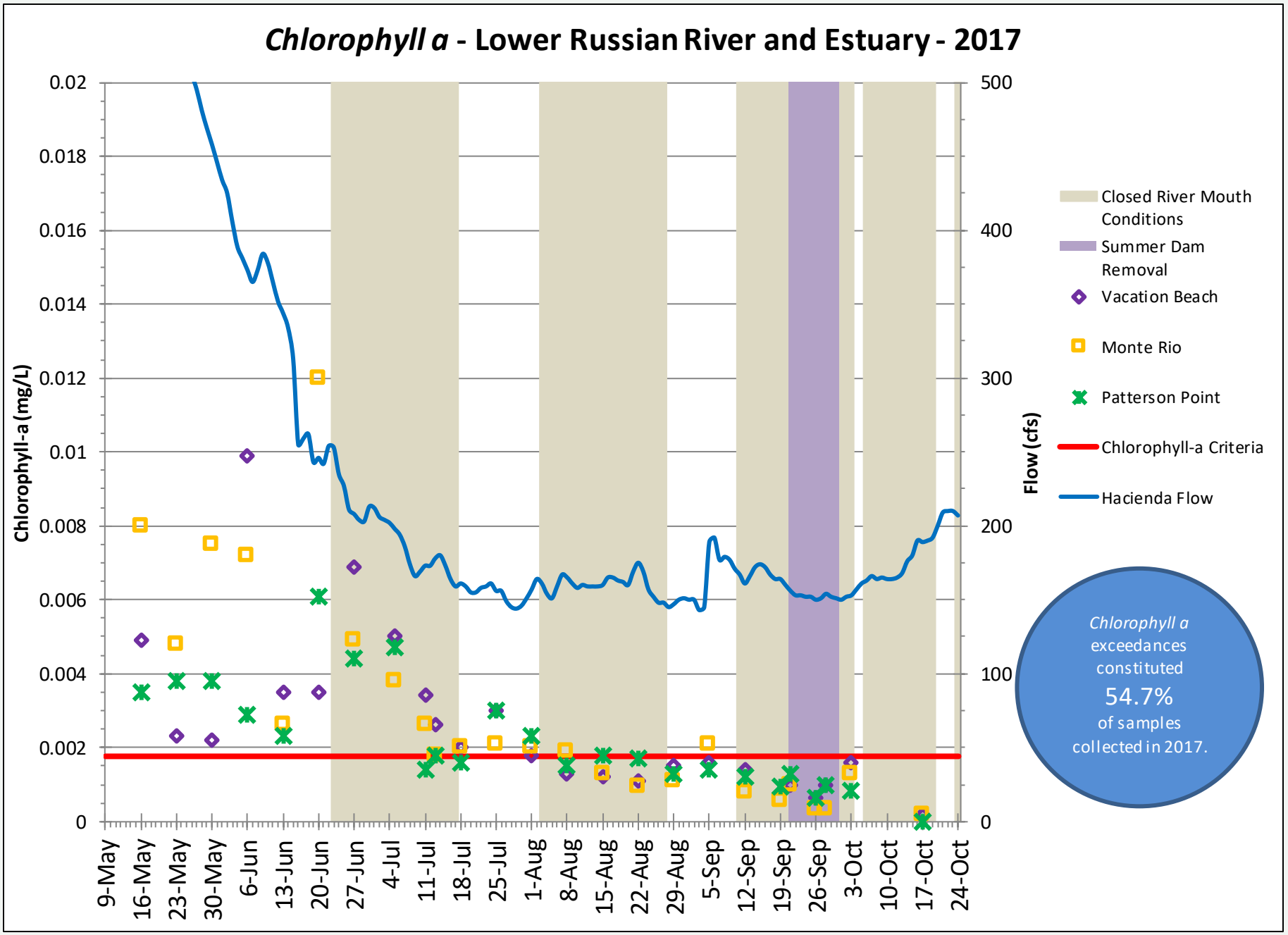

Total Coliform - Lower Russian River and Estuary - 2017
E. coli (MPN)
Flow (cfs)
25000
20000
15000
10000
5000
0
500
400
300
200
100
0
9-May
16-May
23-May
30-May
6-Jun
13-Jun
20-Jun
27-Jun
4-Jul
11-Jul
18-Jul
25-Jul
1-Aug
8-Aug
15-Aug
22-Aug
29-Aug
5-Sep
12-Sep
19-Sep
26-Sep
3-Oct
10-Oct
17-Oct
24-Oct
Closed River Mouth Conditions
Summer Dam Removal
Vacation Beach
Monte Rio
Patterson Point
EPA Total Coliform Criteria
Hacienda Flow
Total Coliform exceedances constituted 4.0% of samples collected in 2017.

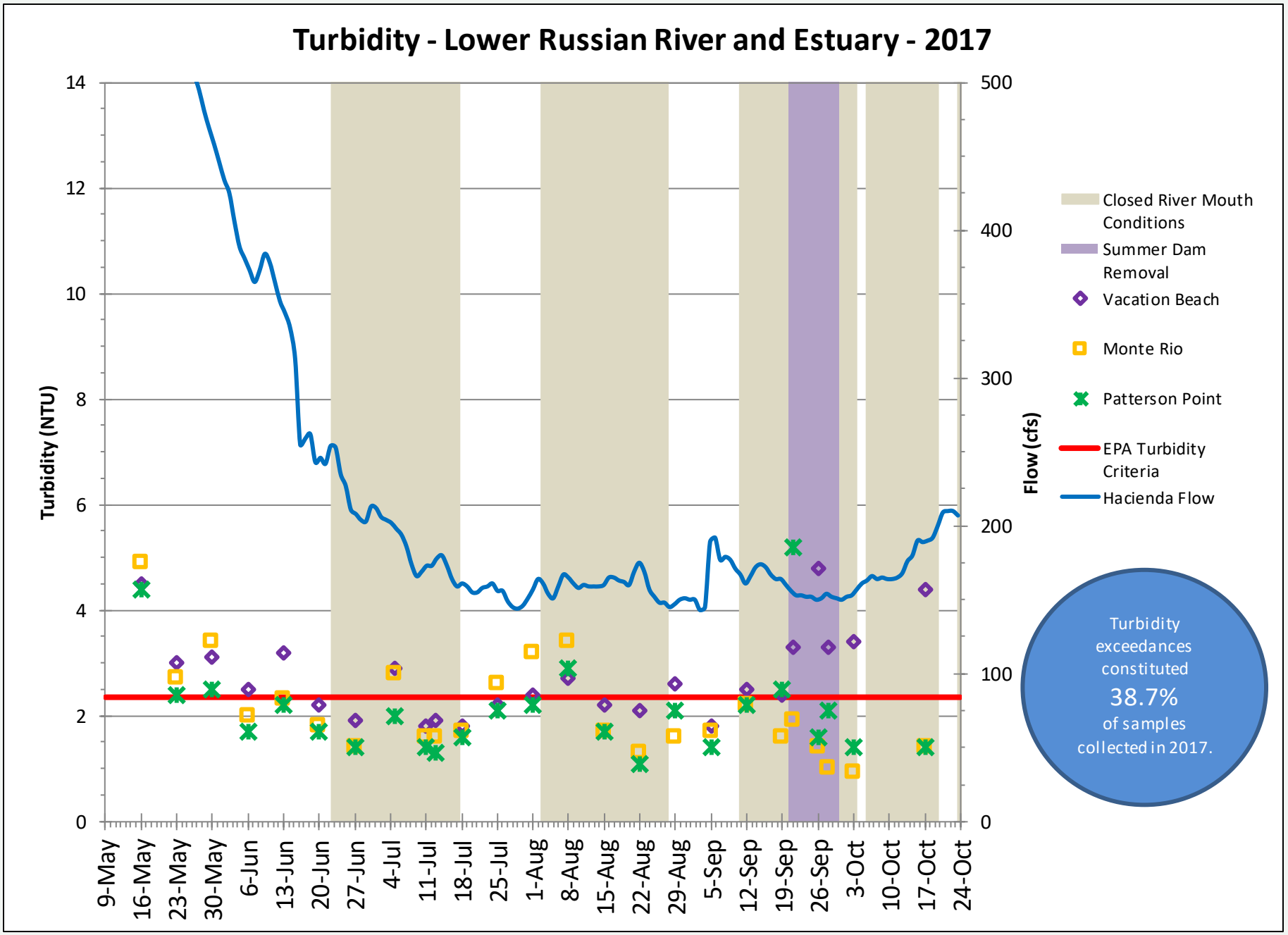

E. coli - Lower Russian River and Estuary - 2017
E. coli (MPN)
Flow (cfs)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
500
400
300
200
100
0
9-May
16-May
23-May
30-May
6-Jun
13-Jun
20-Jun
27-Jun
4-Jul
11-Jul
18-Jul
25-Jul
1-Aug
8-Aug
15-Aug
22-Aug
29-Aug
5-Sep
12-Sep
19-Sep
26-Sep
3-Oct
10-Oct
17-Oct
24-Oct
Closed River Mouth Conditions
Summer Dam Removal
Vacation Beach
Monte Rio
Patterson Point
EPA E. coli criteria
Hacienda Flow
E. coli exceedances constituted 1.3% of samples collected in 2017.


Enterococcus - Lower Russian River and Estuary - 2017
Enterococcus (MPN)
Flow (cfs)
1000
900
800
700
600
500
400
300
200
100
0
500
400
300
200
100
0
8/15 - 2419.6 MPN
Patterson Point
9-May
16-May
23-May
30-May
6-Jun
13-Jun
20-Jun
27-Jun
4-Jul
11-Jul
18-Jul
25-Jul
1-Aug
8-Aug
15-Aug
22-Aug
29-Aug
5-Sep
12-Sep
19-Sep
26-Sep
3-Oct
10-Oct
17-Oct
24-Oct
Closed River Mouth Conditions
Summer Dam Removal
Vacation Beach
Monte Rio
Patterson Point
EPA Entero Criteria
Hacienda Flow
Enterococcus exceedances constituted 20.8% of samples collected in 2017.


Total Nitrogen - Lower Russian River and Estuary - 2017
Total Nitrogen (mg/L)
Flow (cfs)
2.5
2
1.5
1
0.5
0
500
400
300
200
100
0
9-May
16-May
23-May
30-May
6-Jun
13-Jun
20-Jun
27-Jun
4-Jul
11-Jul
18-Jul
25-Jul
1-Aug
8-Aug
15-Aug
22-Aug
29-Aug
5-Sep
12-Sep
19-Sep
26-Sep
3-Oct
10-Oct
17-Oct
24-Oct
Closed River Mouth Conditions
Summer Dam Removal
Vacation Beach
Monte Rio
Patterson Point
EPA TN Criteria
Hacienda Flow
Total Nitrogen exceedances constituted 9.3% of samples collected in 2017.


Total Phosphorus - Lower Russian River and Estuary - 2017
Total Phosphorus (mg/L)
Flow (cfs)
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
500
400
300
200
100
0
9-May
16-May
23-May
30-May
6-Jun
13-Jun
20-Jun
27-Jun
4-Jul
11-Jul
18-Jul
25-Jul
1-Aug
8-Aug
15-Aug
22-Aug
29-Aug
5-Sep
12-Sep
19-Sep
26-Sep
3-Oct
10-Oct
17-Oct
24-Oct
Closed River Mouth Conditions
Summer Dam Removal
Vacation Beach
Monte Rio
Patterson Point
EPA TP Criteria
Hacienda Flow
Total Phosphorus exceedances constituted 97.3% of samples collected in 2017.


Chlorophyll a - Lower Russian River and Estuary - 2017
Chlorophyll-a (mg/L)
Flow (cfs)
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
500
400
300
200
100
0
9-May
16-May
23-May
30-May
6-Jun
13-Jun
20-Jun
27-Jun
4-Jul
11-Jul
18-Jul
25-Jul
1-Aug
8-Aug
15-Aug
22-Aug
29-Aug
5-Sep
12-Sep
19-Sep
26-Sep
3-Oct
10-Oct
17-Oct
24-Oct
Closed River Mouth Conditions
Summer Dam Removal
Vacation Beach
Monte Rio
Patterson Point
Chlorophyll-a Criteria
Hacienda Flow
Chlorophyll a exceedances constituted 54.7% of samples collected in 2017.


Turbidity - Lower Russian River and Estuary - 2017
Turbidity (NTU)
Flow (cfs)
0
2
4
6
8
10
12
14
0
100
200
300
400
500
9-May
16-May
23-May
30-May
6-Jun
13-Jun
20-Jun
27-Jun
4-Jul
11-Jul
18-Jul
25-Jul
1-Aug
8-Aug
15-Aug
22-Aug
29-Aug
5-Sep
12-Sep
19-Sep
26-Sep
3-Oct
10-Oct
17-Oct
24-Oct
Closed River Mouth Conditions
Summer Dam Removal
Vacation Beach
Monte Rio
Patterson Point
EPA Turbidity Criteria
Hacienda Flow
Turbidity exceedances constituted 38.7% of samples collected in 2017.

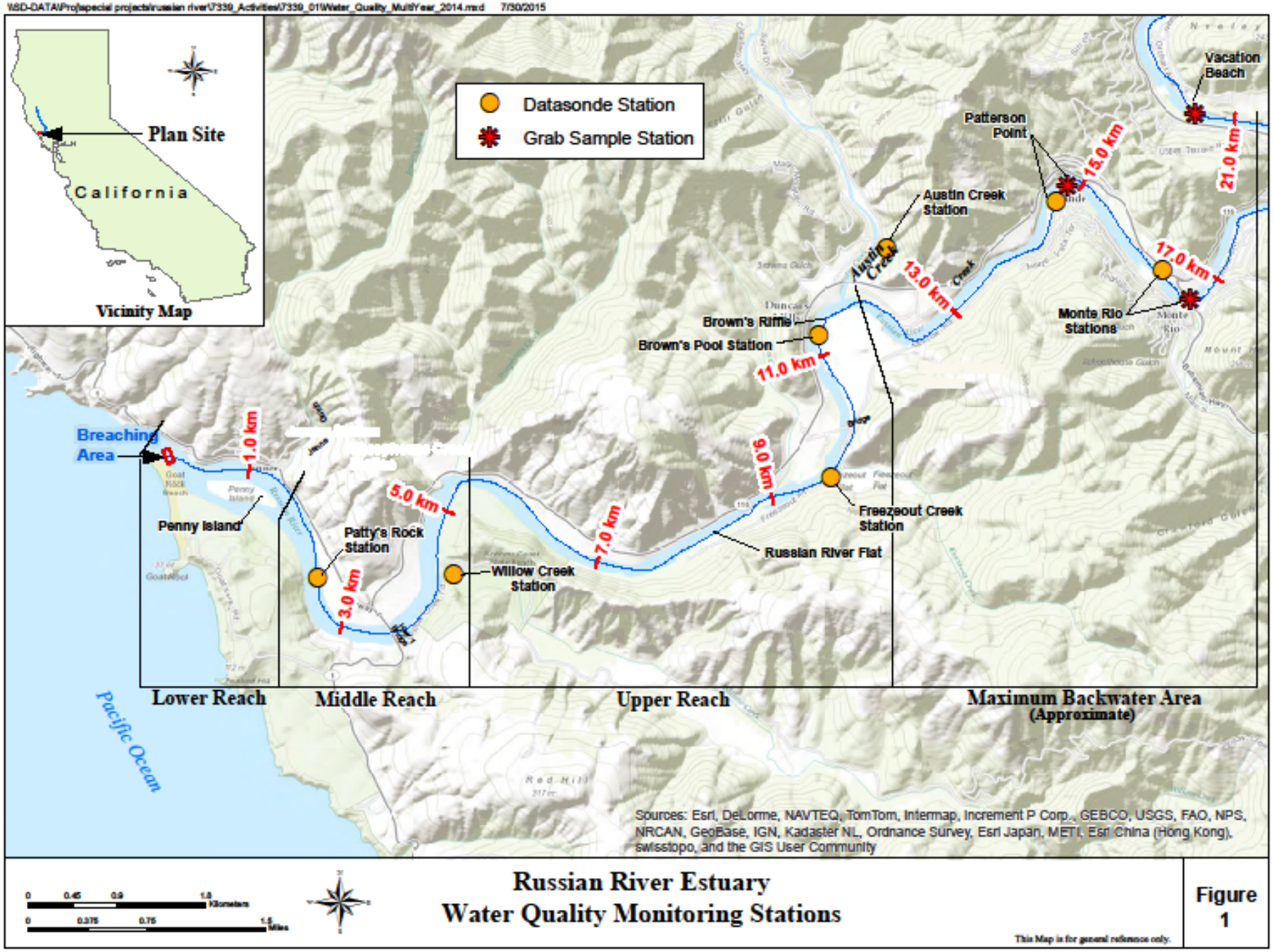

W:\GIS-DATA\Projects\special projects\russian river\7339_Activities\7339_01\Water_Quality_MultiYear_2014.mxd 7/30/2015
Plan Site
California
Vicinity Map
Datasonde Station
Grab Sample Station
Vacation Beach
Patterson Point
15.0 km
21.0 km
Austin Creek Station
Austin Creek
13.0 km
17.0 km
Monte Rio Stations
Brown's Riffle
Brown's Pool Station
11.0 km
Breaching Area
1.0 km
9.0 km
5.0 km
7.0 km
Freezeout Creek Station
Penny Island
Patty's Rock Station
Willow Creek Station
3.0 km
Russian River Flat
Pacific Ocean
Lower Reach
Middle Reach
Upper Reach
Maximum Backwater Area
(Approximate)
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community
0 0.45 0.9 1.8 Kilometers
0 0.375 0.75 1.5 Miles
Russian River Estuary
Water Quality Monitoring Stations
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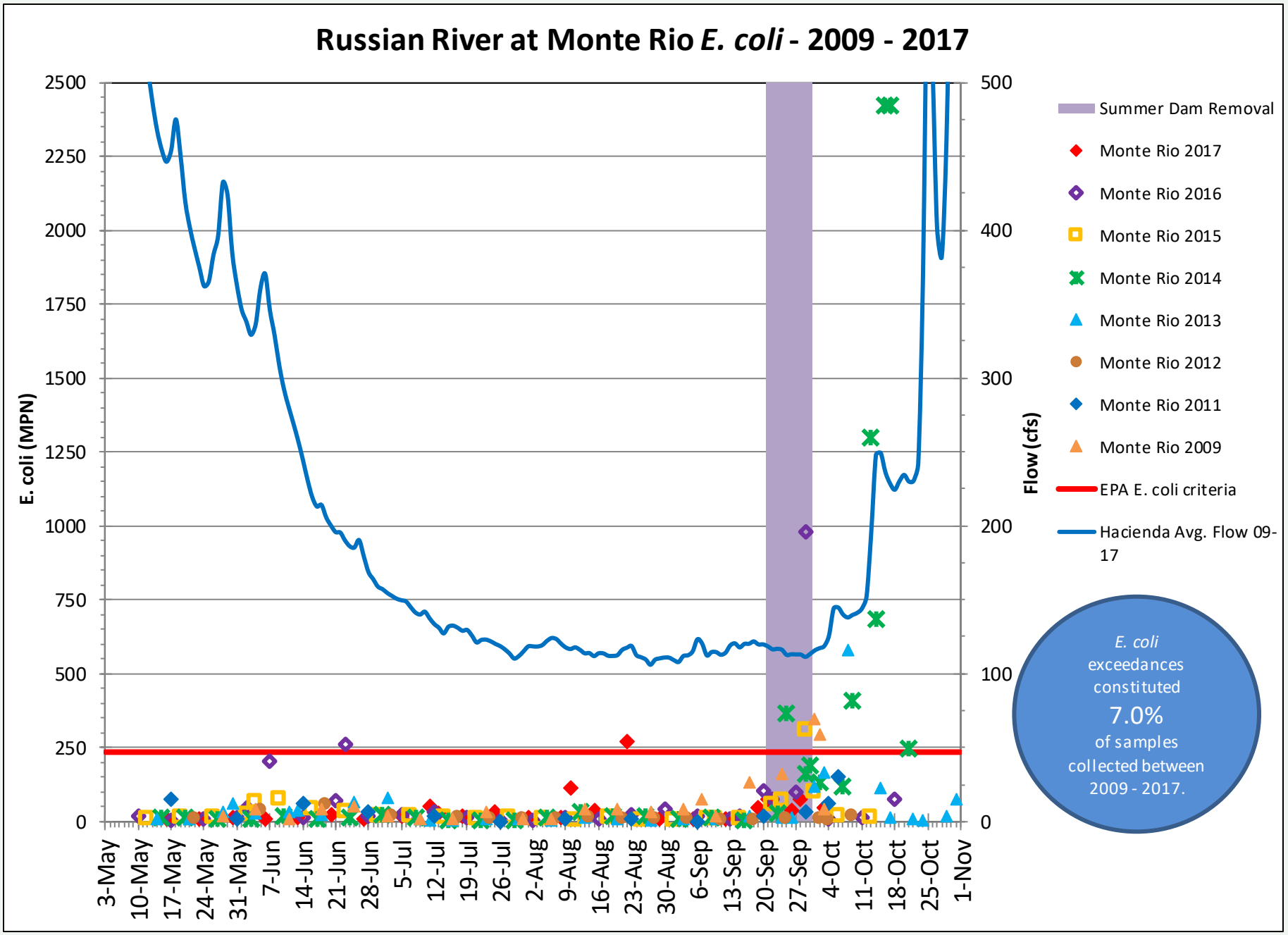
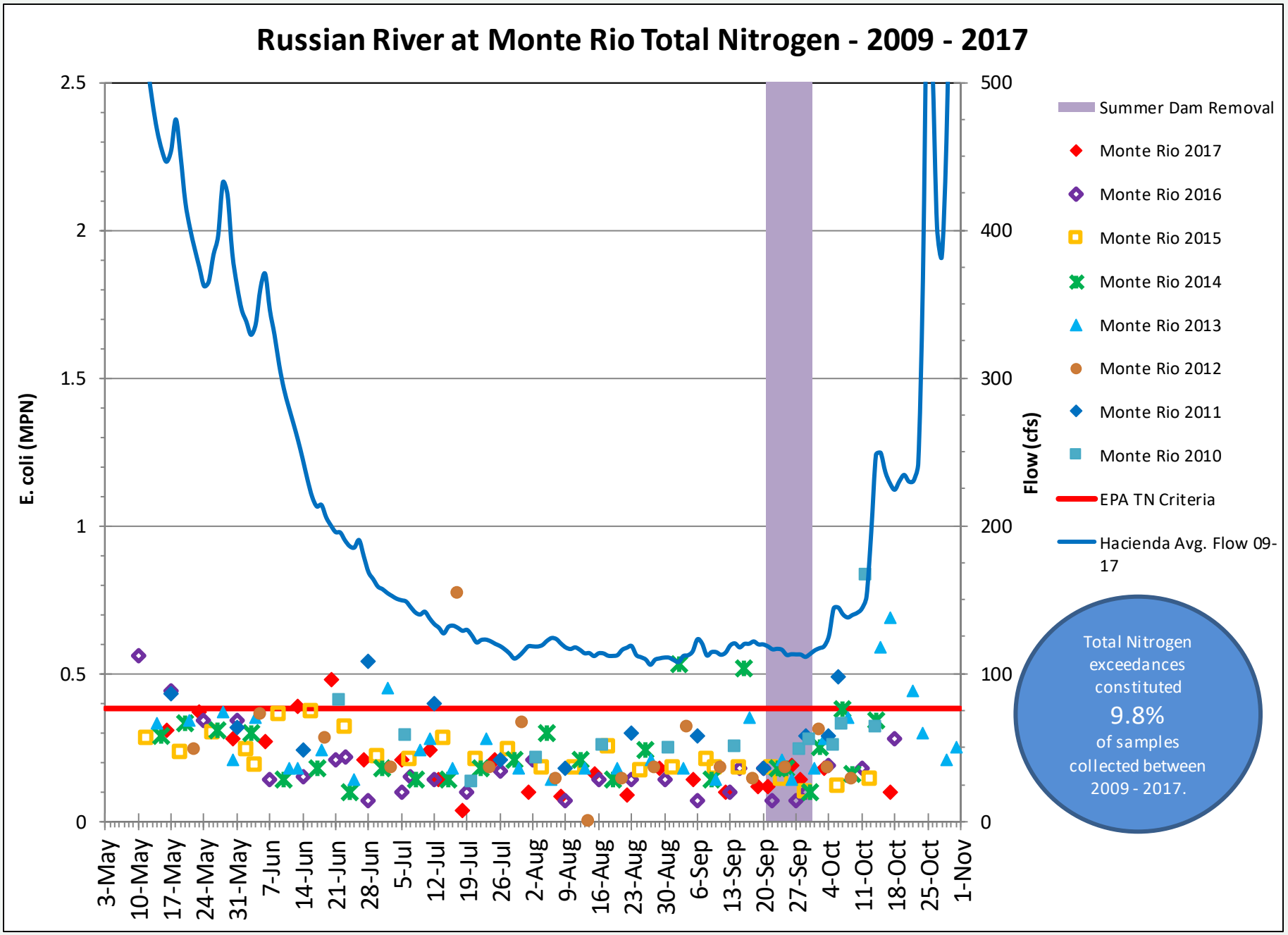
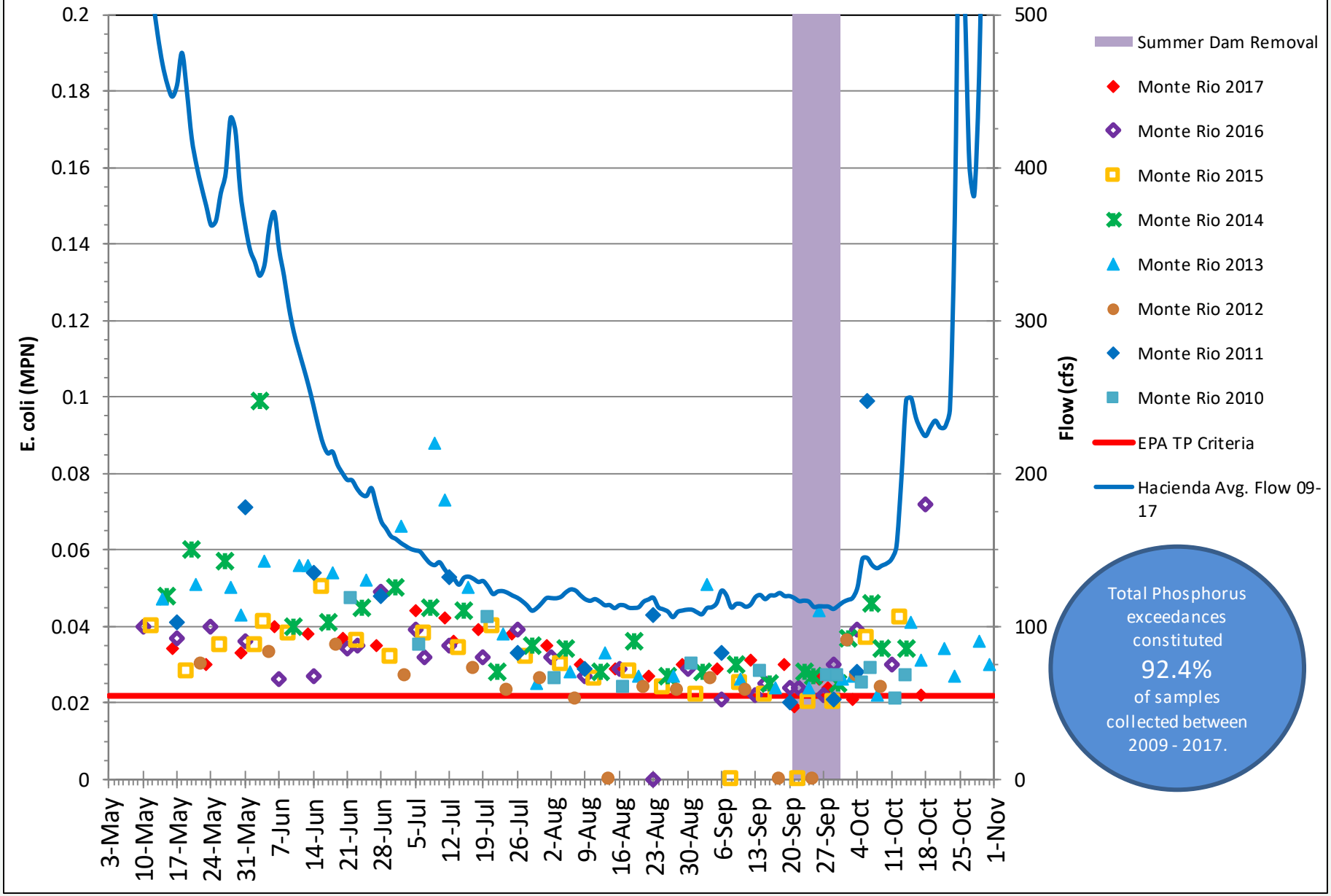
Figure 1

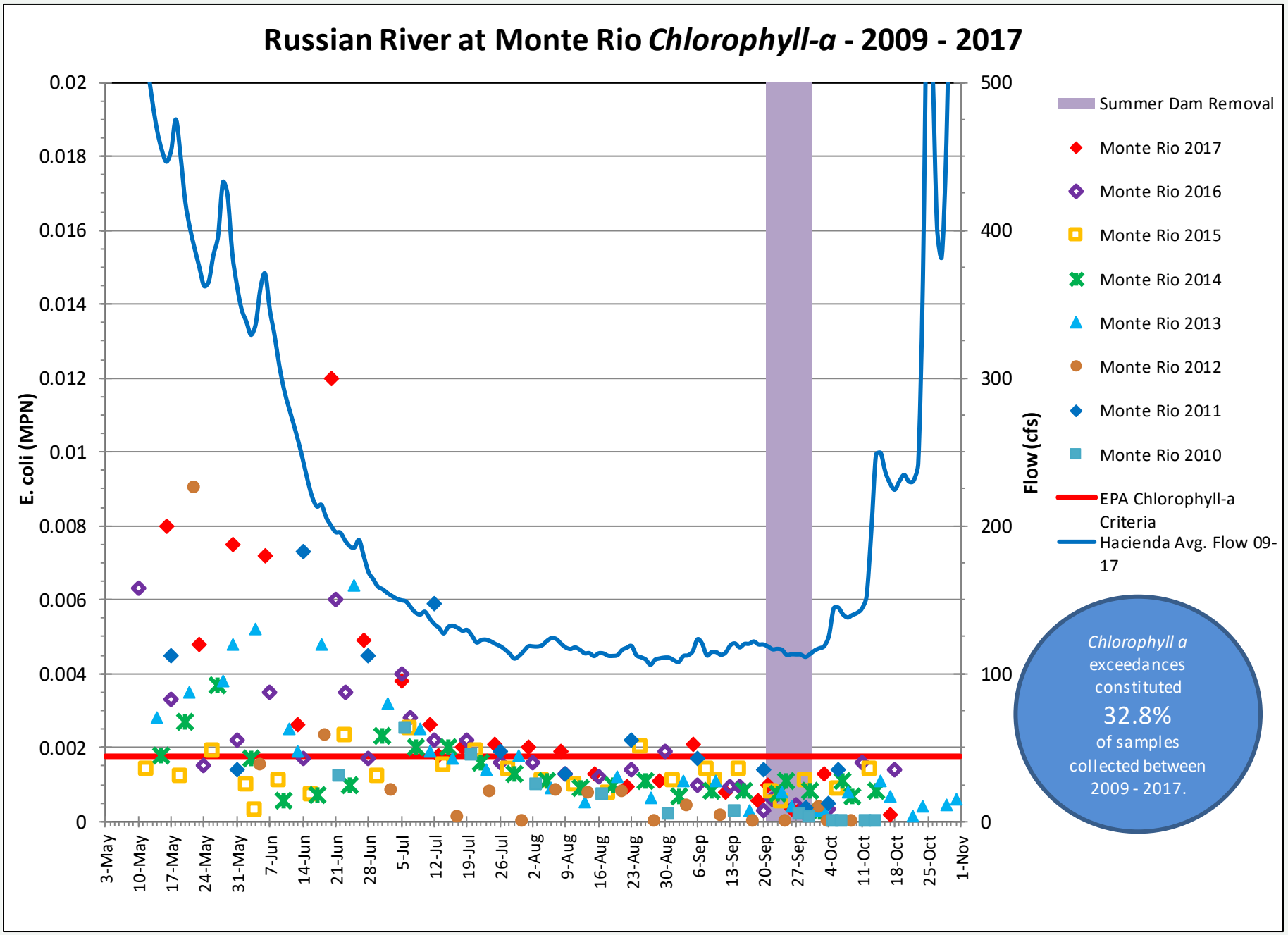

Russian River at Monte Rio E. coli - 2009 - 2017
E. coli (MPN)
Flow (cfs)
2500
2250
2000
1750
1500
1250
1000
750
500
250
0
500
400
300
200
100
0
3-May
10-May
17-May
24-May
31-May
7-Jun
14-Jun
21-Jun
28-Jun
5-Jul
12-Jul
19-Jul
26-Jul
2-Aug
9-Aug
16-Aug
23-Aug
30-Aug
6-Sep
13-Sep
20-Sep
27-Sep
4-Oct
11-Oct
18-Oct
25-Oct
1-Nov
Summer Dam Removal
Monte Rio 2017
Monte Rio 2016
Monte Rio 2015
Monte Rio 2014
Monte Rio 2013
Monte Rio 2012
Monte Rio 2011
Monte Rio 2009
EPA E. coli criteria
Hacienda Avg. Flow 09-17
E. coli exceedances constituted 7.0% of samples collected between 2009 - 2017.

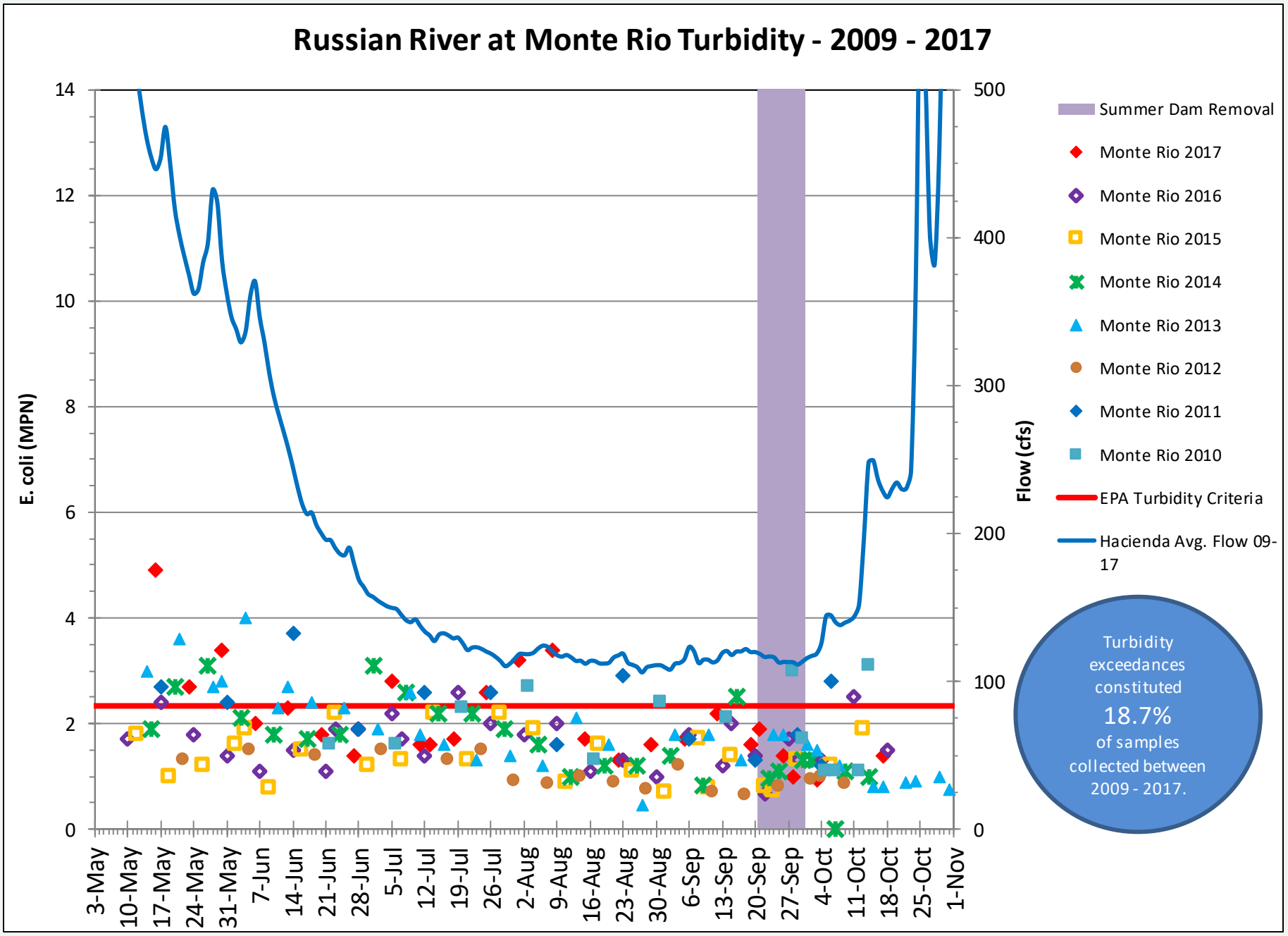

Russian River at Monte Rio Total Nitrogen - 2009 - 2017
E. coli (MPN)
Flow (cfs)
2.5
2
1.5
1
0.5
0
500
400
300
200
100
0
3-May
10-May
17-May
24-May
31-May
7-Jun
14-Jun
21-Jun
28-Jun
5-Jul
12-Jul
19-Jul
26-Jul
2-Aug
9-Aug
16-Aug
23-Aug
30-Aug
6-Sep
13-Sep
20-Sep
27-Sep
4-Oct
11-Oct
18-Oct
25-Oct
1-Nov
Summer Dam Removal
Monte Rio 2017
Monte Rio 2016
Monte Rio 2015
Monte Rio 2014
Monte Rio 2013
Monte Rio 2012
Monte Rio 2011
Monte Rio 2010
EPA TN Criteria
Hacienda Avg. Flow 09-17
Total Nitrogen exceedances constituted 9.8% of samples collected between 2009 - 2017.

Russian River at Monte Rio Total Phosphorus - 2009 - 2017



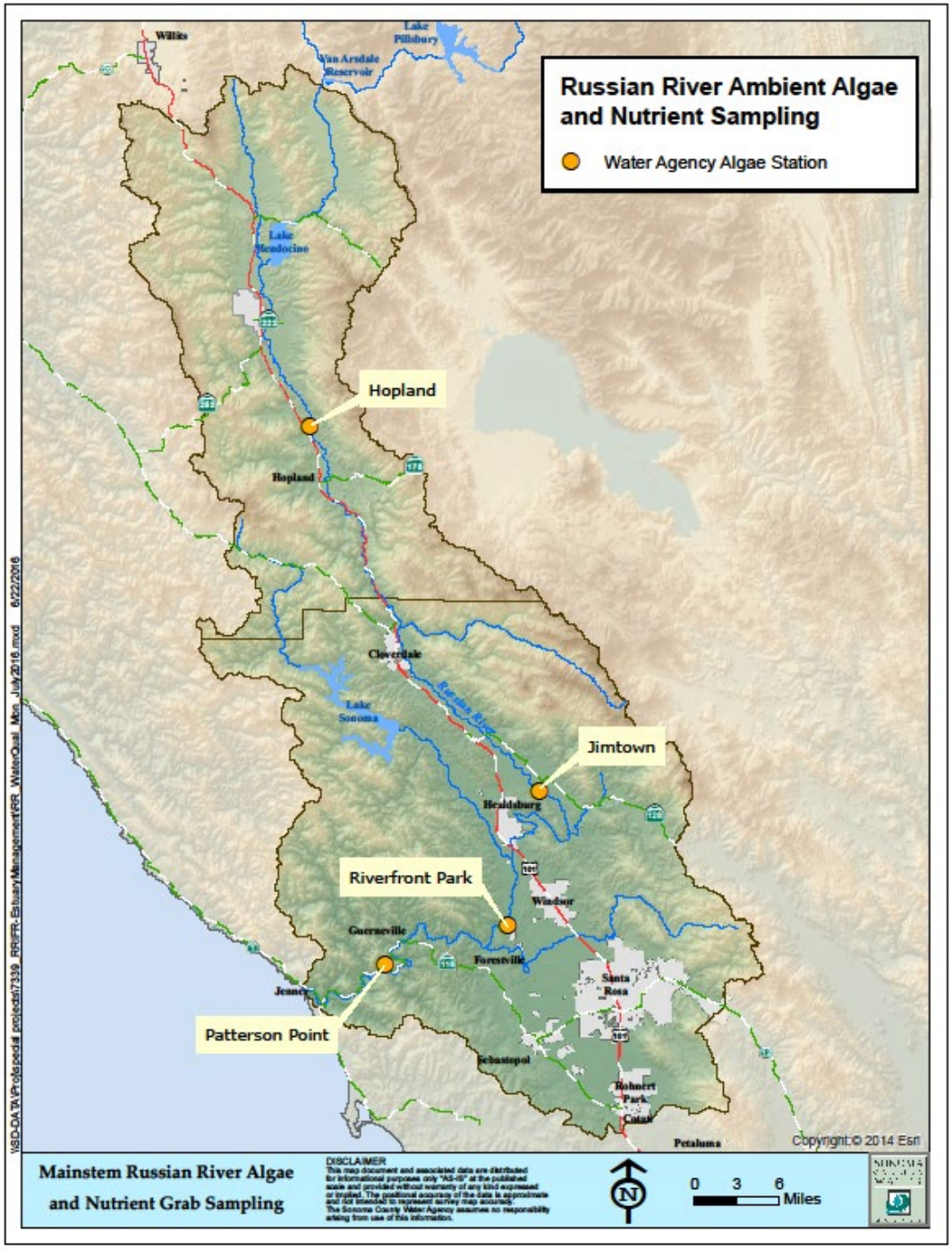
Total Phosphorus exceedances constituted **92.4%** of samples collected between 2009 - 2017.


Russian River at Monte Rio *Chlorophyll-a* - 2009 - 2017
E. coli (MPN)
Flow (cfs)
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
500
400
300
200
100
0
3-May
10-May
17-May
24-May
31-May
7-Jun
14-Jun
21-Jun
28-Jun
5-Jul
12-Jul
19-Jul
26-Jul
2-Aug
9-Aug
16-Aug
23-Aug
30-Aug
6-Sep
13-Sep
20-Sep
27-Sep
4-Oct
11-Oct
18-Oct
25-Oct
1-Nov
Summer Dam Removal
Monte Rio 2017
Monte Rio 2016
Monte Rio 2015
Monte Rio 2014
Monte Rio 2013
Monte Rio 2012
Monte Rio 2011
Monte Rio 2010
EPA Chlorophyll-a Criteria
Hacienda Avg. Flow 09-17
Chlorophyll a exceedances constituted 32.8% of samples collected between 2009 - 2017.


Russian River at Monte Rio Turbidity - 2009 - 2017
E. coli (MPN)
Flow (cfs)
0
2
4
6
8
10
12
14
0
100
200
300
400
500
3-May
10-May
17-May
24-May
31-May
7-Jun
14-Jun
21-Jun
28-Jun
5-Jul
12-Jul
19-Jul
26-Jul
2-Aug
9-Aug
16-Aug
23-Aug
30-Aug
6-Sep
13-Sep
20-Sep
27-Sep
4-Oct
11-Oct
18-Oct
25-Oct
1-Nov
Summer Dam Removal
Monte Rio 2017
Monte Rio 2016
Monte Rio 2015
Monte Rio 2014
Monte Rio 2013
Monte Rio 2012
Monte Rio 2011
Monte Rio 2010
EPA Turbidity Criteria
Hacienda Avg. Flow 09-17
Turbidity exceedances constituted 18.7% of samples collected between 2009 - 2017.

2018 Estuary and MBA Monitoring

- Deploy datasondes in Estuary and MBA
- Collect weekly grab samples for:
  - Nutrients
  - Bacteria
  - Chlorophyll a (algae)
- Green and Blue-Green (Cyanobacteria) Algae monitoring


Russian River Ambient Algae and Nutrient Sampling
Water Agency Algae Station
Hopland
Jimtown
Riverfront Park
Patterson Point
Willits
Lake Pillsbury
Van Arsdale Reservoir
Lake Mendocino
Hopland
Cloverdale
Lake Sonoma
Russian River
Healdsburg
Windsor
Guerneville
Forestville
Jenner
Santa Rosa
Sebastopol
Rohnert Park
Cotati
Petaluma
Copyright © 2014 Esri
Mainstem Russian River Algae and Nutrient Grab Sampling
DISCLAIMER
This map document and associated data are distributed for informational purposes only "AS-IS" at the published scale and provided without warranty of any kind expressed or implied. The positional accuracy of the data is approximate and not intended to represent survey map accuracy. The Sonoma County Water Agency assumes no responsibility arising from use of this information.
N
0 3 6
Miles
SONOMA COUNTY WATER AGENCY
\\SD-DATA\Projects\projects\7339_RRFR-EstuaryManagement\RR_WaterQual_Mon_July2016.mxd 6/22/2016

Blue-Green Algae (Cyanobacteria) Monitoring

- SCWA – green and blue-green (cyanobacteria) algae monitoring in mainstem Russian River
- Regional Board – blue-green (cyanobacteria) algae and cyanotoxin monitoring in mainstem Russian River.
- Sonoma County Department of Health Services (DHS) – cyanotoxin monitoring at 10 Russian River public beaches. http://www.sonoma-county.org/health/services/bluegreen.asp

2017 Lower Russian River and Estuary Water Quality Monitoring

Jeff Church

Senior Environmental Specialist

jchurch@scwa.ca.gov

SONOMA COUNTY WATER AGENCY

Monitoring Pinnipeds at Jenner

Andrea Pecharich

Environmental Specialist

andrea.pecharich@scwa.ca.gov

SONOMA COUNTY WATER AGENCY

Seals and sea lions

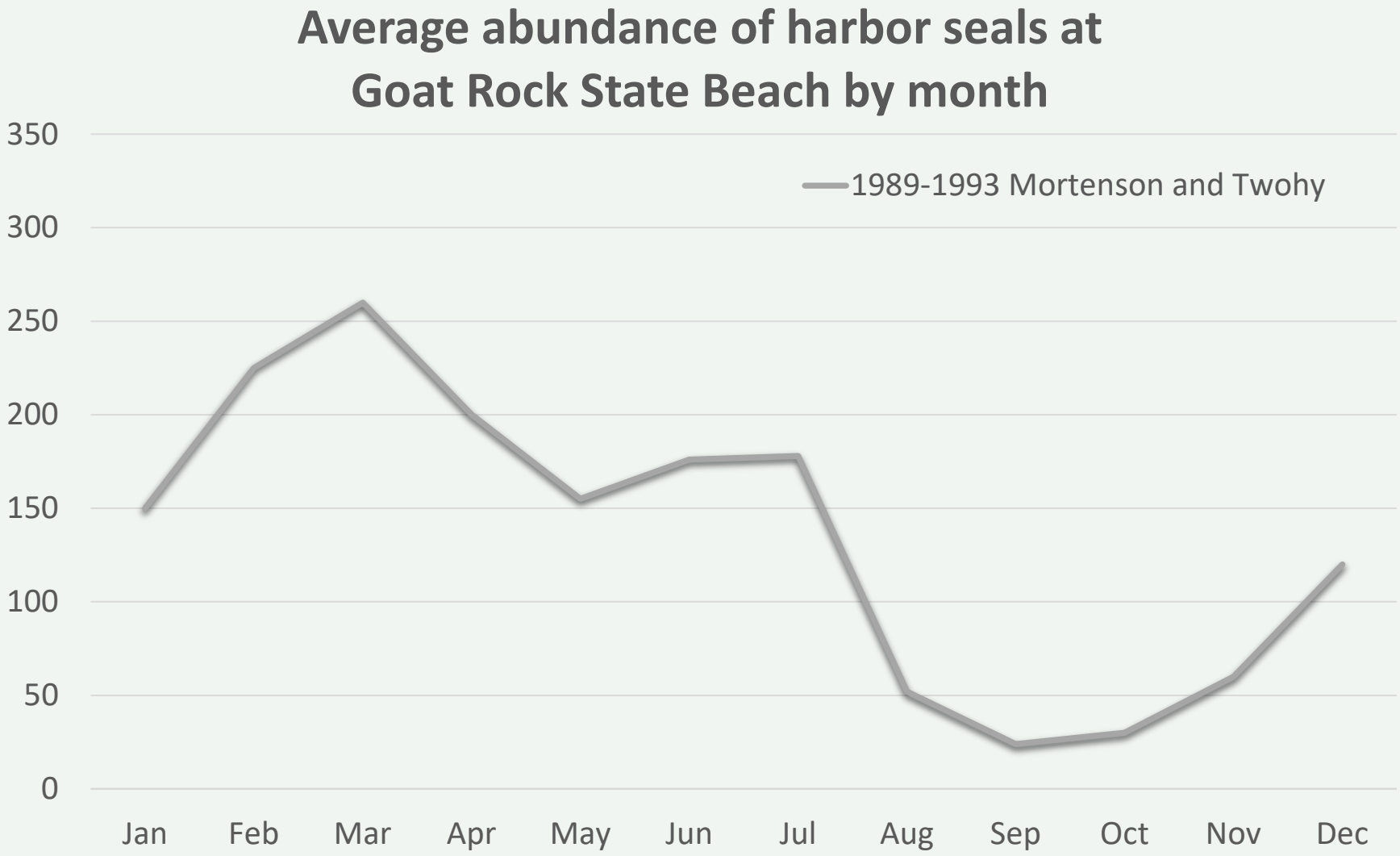
harbor seals

fur seals

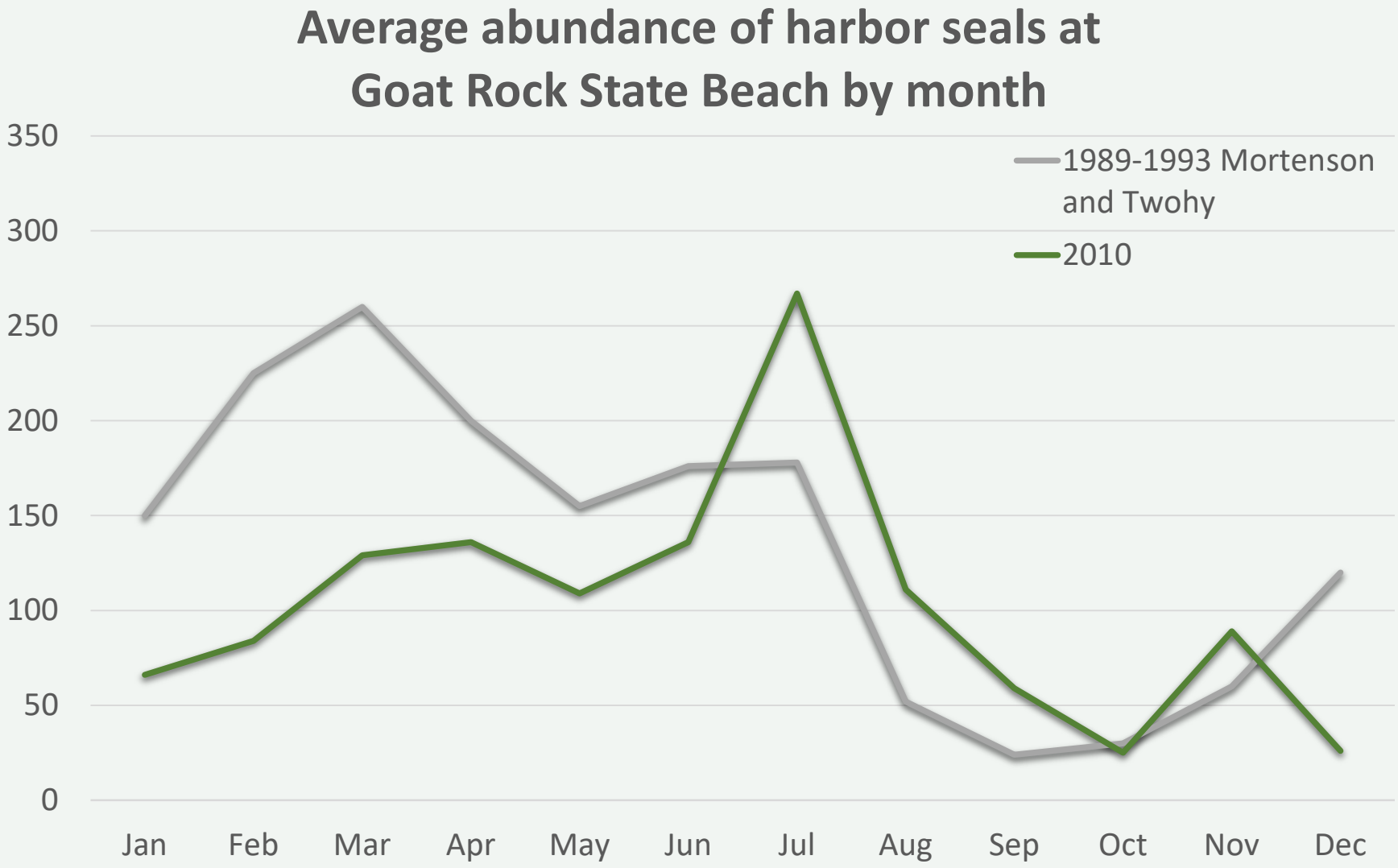
California sea lions

Northern elephant seals

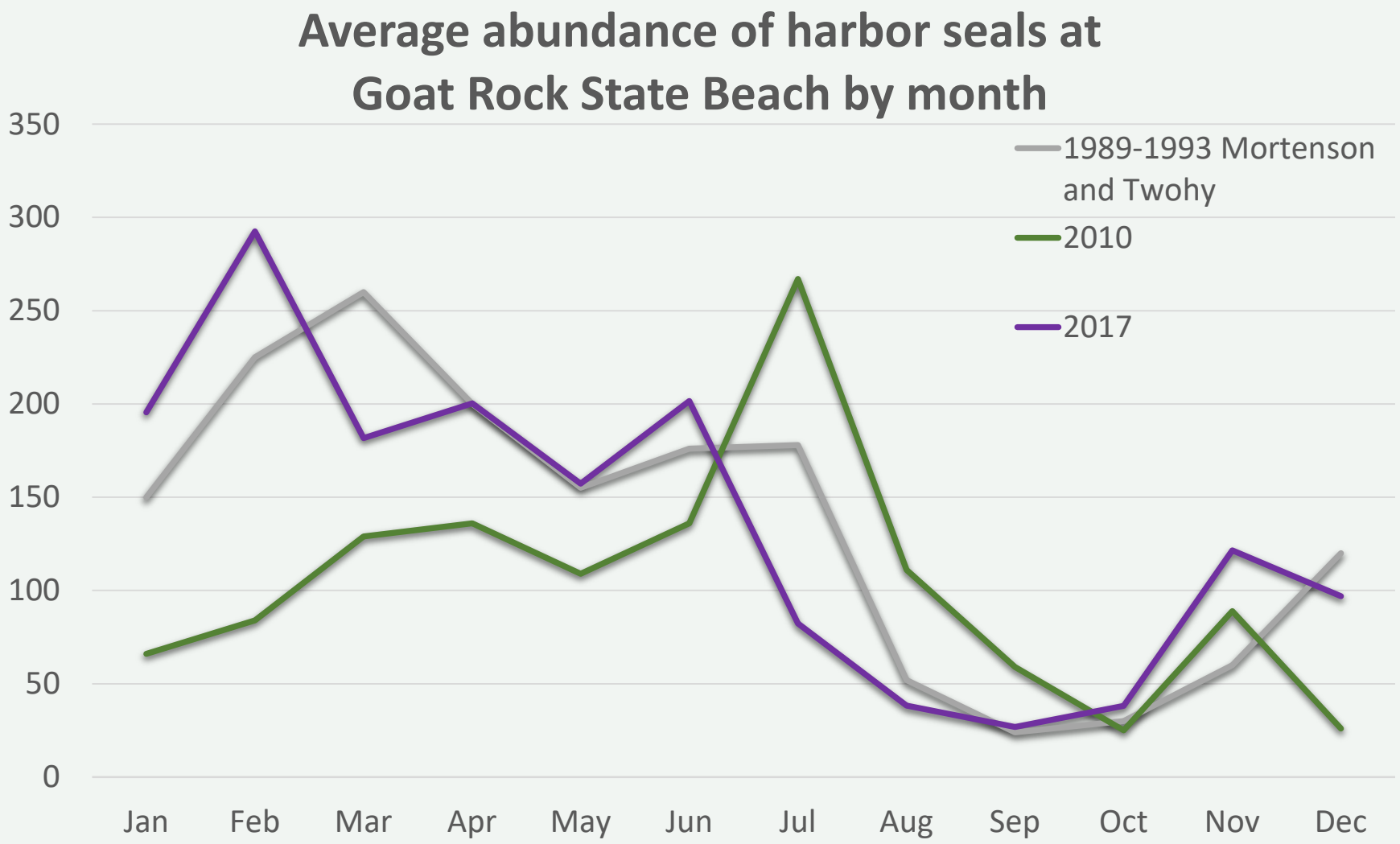
Historic patterns



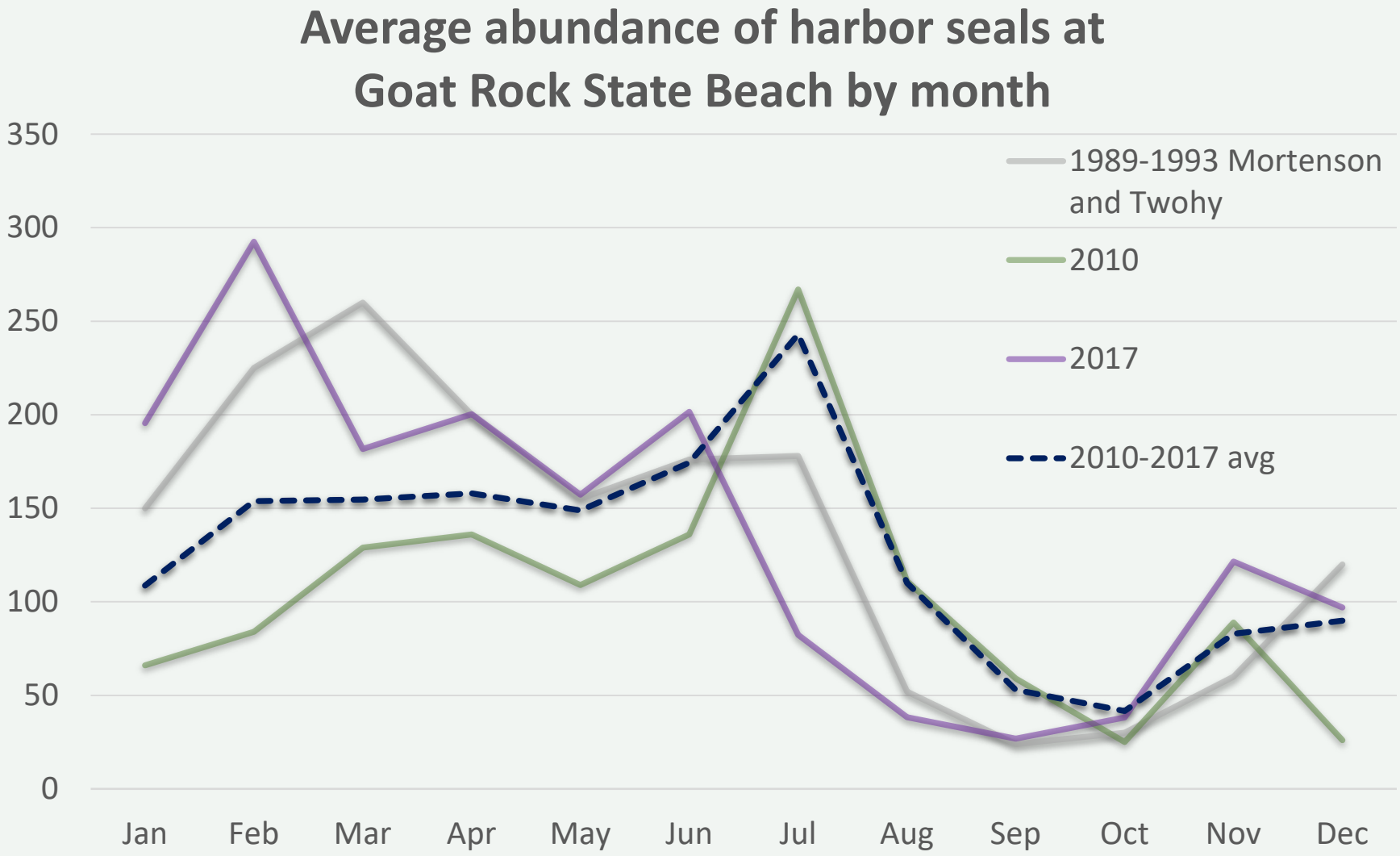
Historic patterns



Historic patterns



Historic patterns



Seasonal patterns

Pupping/mating

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

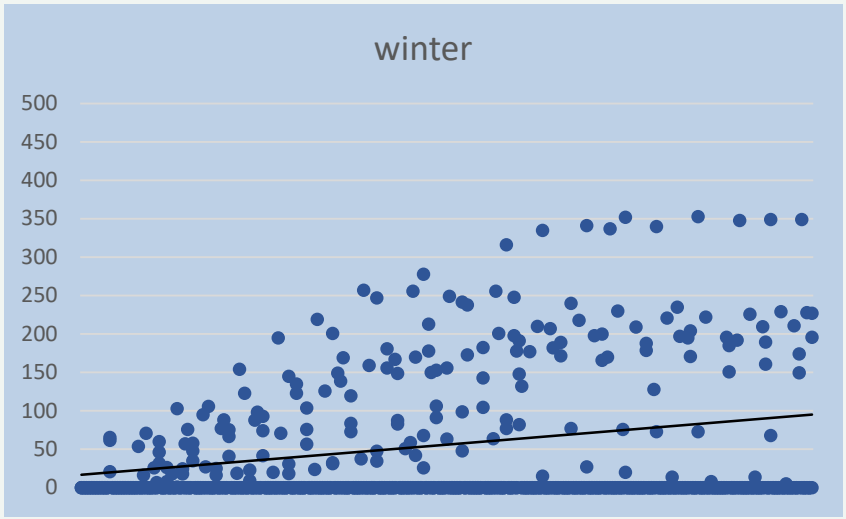
Seasonal patterns

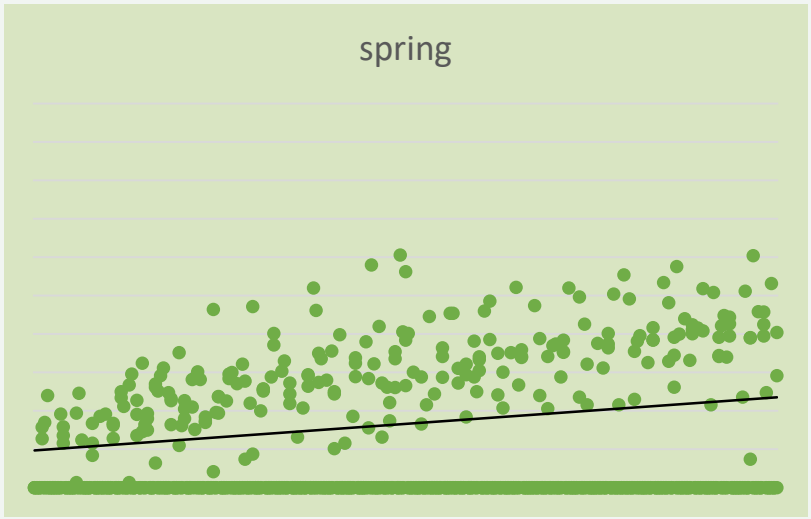
Seasonal patterns

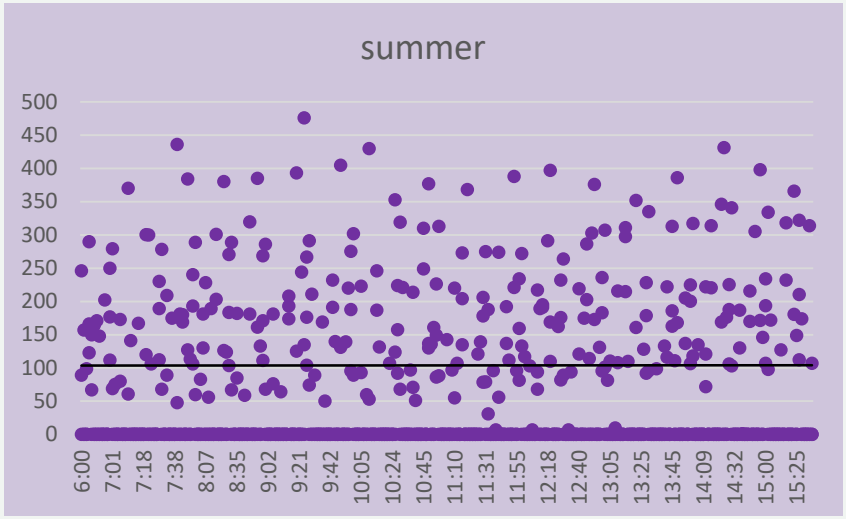
Hungry seals

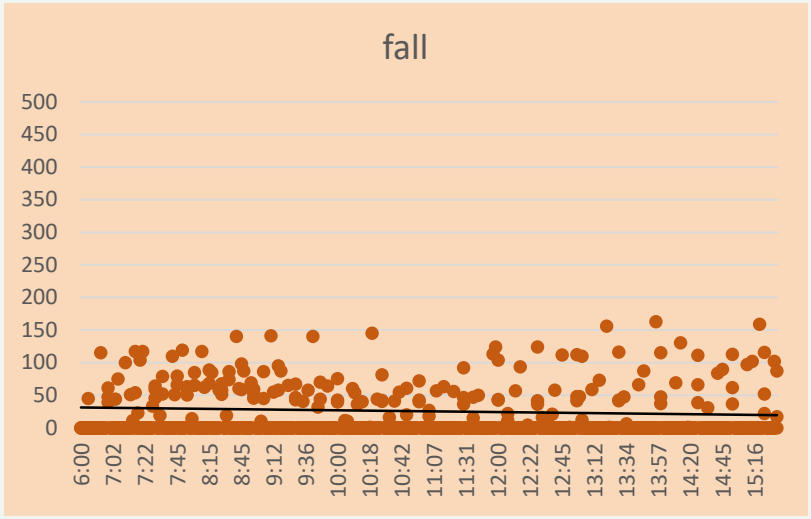
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Daily patterns

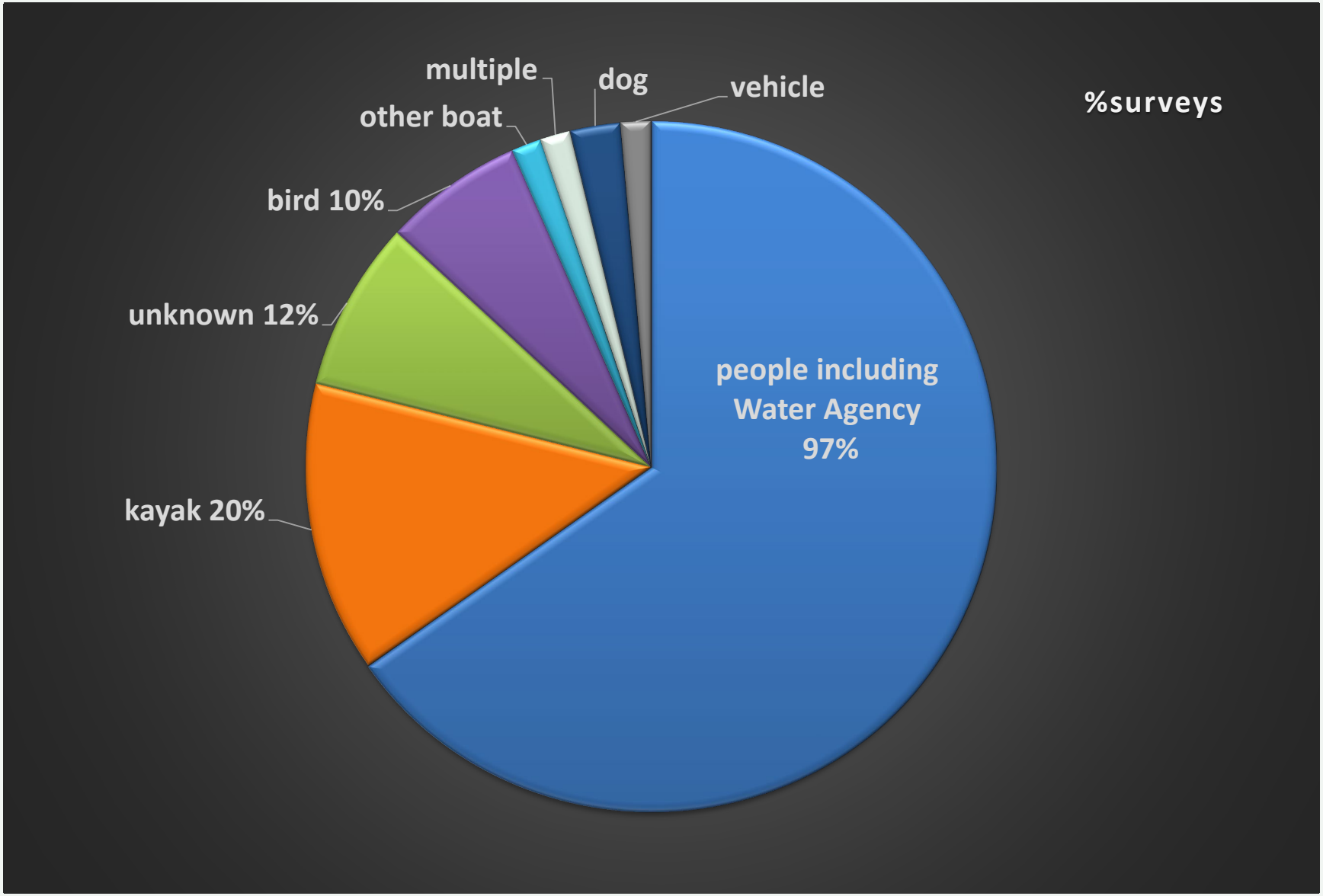




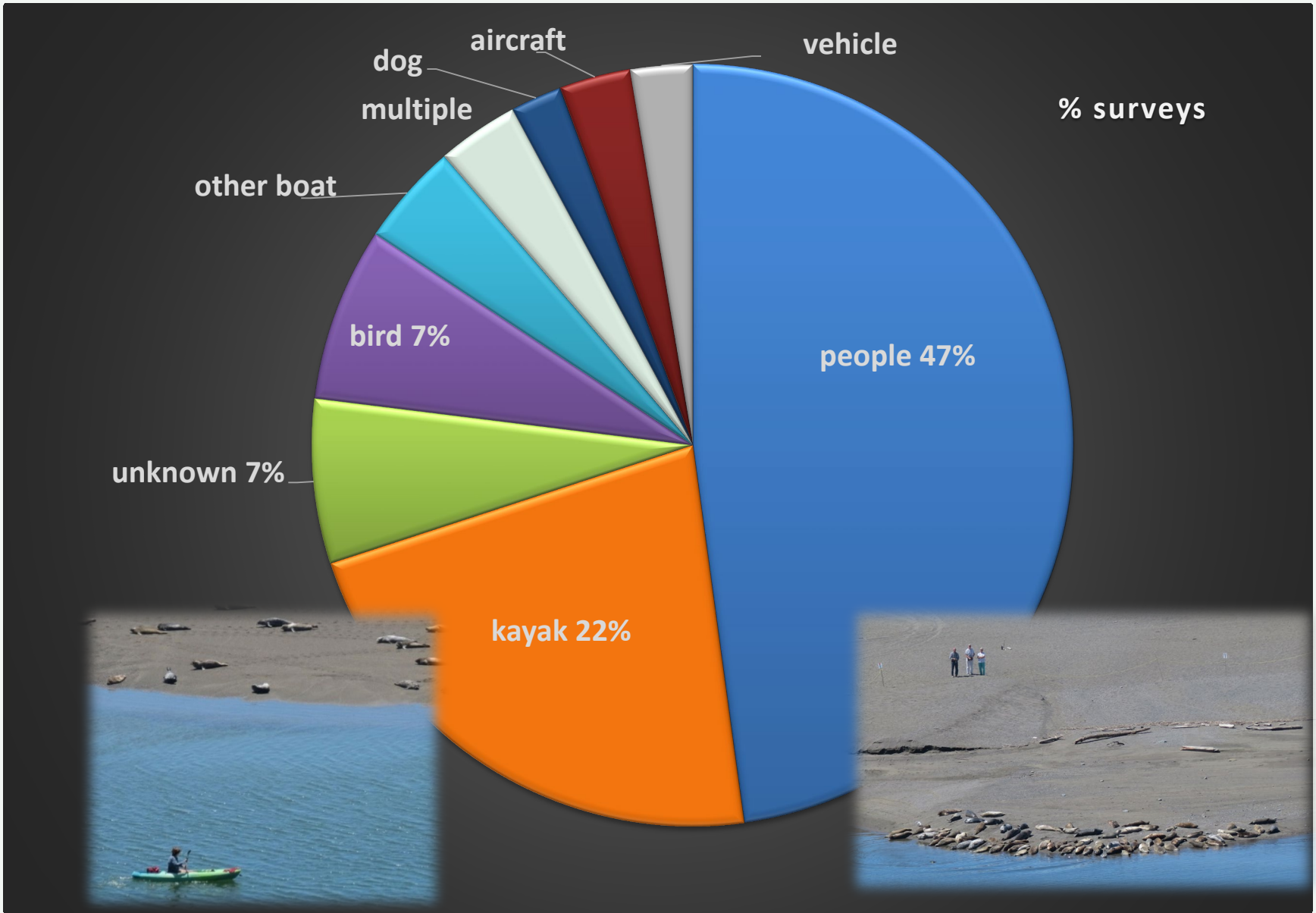




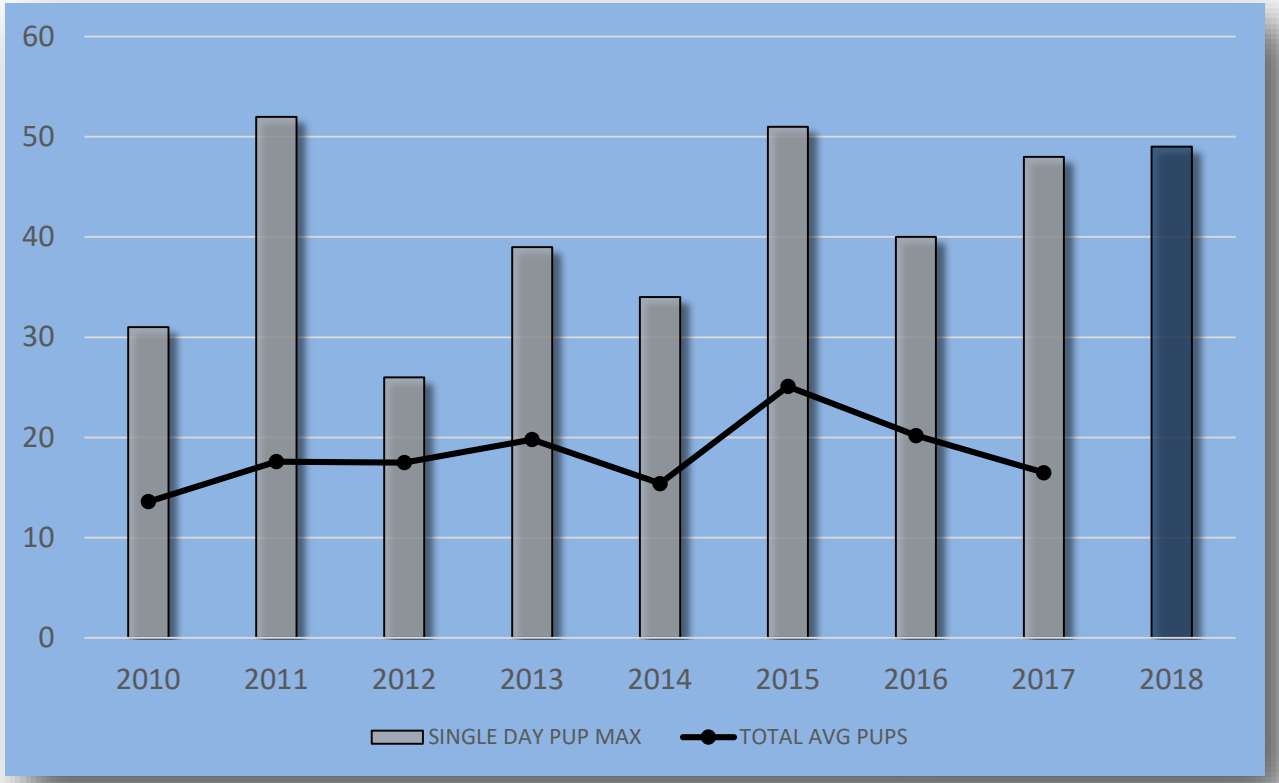
Disturbance: 2009-2017 management activities



Disturbance: 2009-2017 baseline surveys



Healthy pups = healthy haul out



Newborn pups

- Special protections for newborn pups
- Pup will stay with mother for about 30 days
- Pups are born able to swim

- First pup of 2018 born March 30th

One month later…

Monitoring Pinnipeds at Jenner

Andrea Pecharich
Environmental Specialist
andrea.pecharich@scwa.ca.gov

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