

1980 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others

Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors



1981 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1982 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1983 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1984 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1985 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1986 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1987 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1988 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1989 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1990 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1991 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1992 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1993 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1994 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1995 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1996 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1997 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1998 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



1999 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



2000 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



2001 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



2002 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



2003 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



2004 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



2005 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



2006 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



2007 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



2008 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



2009 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



2010 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



2011 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others



2012 San Francisco Estuary Delta Smelt Catch and Seasonal Salinity Gradient

Delta Smelt Total Population Salinity Gradient PSU

Annual average catch per unit effort (CPUE)

- × 0
- 0.01-0.1
- 0.1-1
- 1.01-10
- 10.01-30

Practical Salinity Units (PSU)
Feb - June seasonal salinity gradient

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 8
- 8.01 - 10
- 10.01 - 12
- 12.01 - 14
- 14.01 - 16
- 16.01 - 18
- 18.01 - 20
- 20.01 - 22
- 22.01 - 24
- 24.01 - 26
- 26.01 - 28
- 28.01 - 30

0 3.75 7.5 15 Miles

About this map

The February to June seasonal salinity gradient is plotted in the SF Estuary beneath the annual average CPUE of delta smelt (total population) for each monitoring station in the SF Bay Study mid-water trawl, consistent with the salinity-abundance relationship published in Kimmerer (2002), Marine Ecology and Progress Series 243: 39-55.

WTR1502244.1

E. Foresman 7/13/2015

Data sources

Fish CPUE - San Francisco Bay Study CA Department of Fish and Wildlife and the Interagency Ecological Program
 Salinity Gradient - Coarse-grid version of UnTRIM San Francisco Bay-Delta Model, Delta Modeling Associates
 Basemap - ESRI, DeLorme, BEBCO, NAANGDC, & others

