A Tale of Two Channels: Sheldrake Slough and First Mallard Branch, Suisun Marsh

Cathy Ruhl, US Geological Survey
Where in the world??

Extension of Chris Enright’s work
Sheldrake Slough

First Mallard Branch

Managed Marsh

Tidal Forcing

Low Berms near MHHW

Tidal Marsh

Channel Capacity

Overland Flows

Temperature

Dendritic

Channelized Flows

Levees

Strong spring/neap Signal

Chris Enright, DWR
First Mallard Branch:

- July 2017 – Sept 2018
- Discharge
- Gage Height
- Tidally Filtered Discharge
Sheldrake Slough

- July 2017 – January 2018
- Discharge
- Gage Height
- Tidally Filtered Discharge
• Typical Range:
  • 250 – 350 cfs

• Overtopping Events
  • 750 – 1200 cfs
  • 2 to 3 times!!
• Over-Topping Events

• Gage Height
  • > ~ 28.9 ft
  • Arbitrary datum

• Tidal Marsh Plain Inundation

• Rapid Reversal

• Short Duration

• Night-time Events
• Seasonal Variability
  • Summer vs Winter
  • High Outflow vs Low Outflow
Overtopping Events

- Occurring at night
- Abrupt changes
- Short duration

Chris Enright, DWR
• Water Quality Parameters
  • Temperature
  • Specific Conductance
  • Turbidity
  • Dissolved Oxygen
  • pH
  • Chlorophyll a
  • CDOM
  • Nitrate Analyzer (SUNA)

• Nighttime Inundation
  • Cooling ~ 2 degrees C

• Adjacent Channels
  • Sharp gradients
Temperature

- No data at Sheldrake
- Cooling pattern not expected
- Adjacent channels

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