San Francisco Coastal Geology Field Class – GEOL 21A
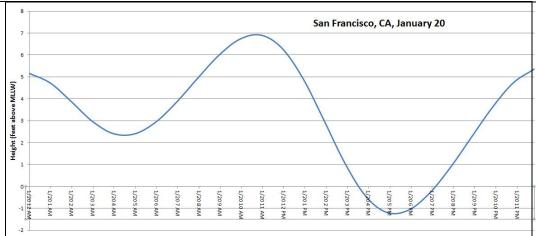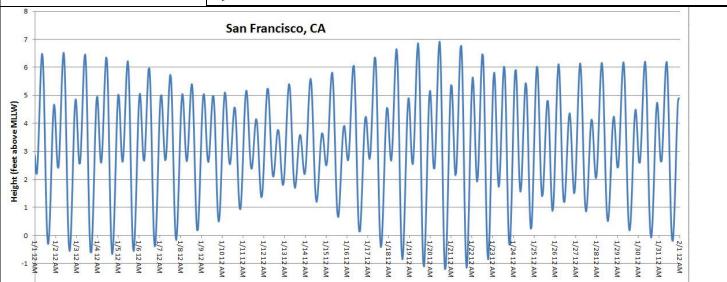## ORIENTATION IN-CLASS EXERCISES
TIDES

LABEL in this image:
- **Higher high water (HHW)**
- **Higher low water (HLW)**
- **Lower high water (LHW)**
- **Lower low water (LLW)**
- **Slackwater (SW)**
- **Ebb current (EC)**
- **Flood current (FC)**
- **Tidal range (TR)**
- **Tidal period (TP)**

San Francisco, CA, January 20

San Francisco, CA

San Francisco, CA
1. The **tidal pattern** is? CIRCLE: diurnal | semidiurnal | semidiurnal mixed
2. **Largest tidal range** for this chart is? (Label on chart)
3. Days of the month in which neap tides are occurring? (circle on chart)
4. **Tidal datum** (choice of zero reference point) for this chart? CIRCLE:
   MLW (mean low water) | MLLW (mean lower low water) | MSL (mean sea level) | MTL (mean tide level) MHW (mean high water) | MHHW (mean higher high water).

Tidal corrections for various field sites based on tides at Golden Gate Bridge:

Location	High tide correction (time)	Low tide correction (time)
Point Bonita (Rodeo Beach)	-17 mins | +0.3 ft	-10 mins
Ocean Beach	-49 mins | +0.1 ft	-35 mins
Princeton Harbor (closest to Gray Whale Cove Beach)	-66 mins | -0.3 ft	-50 mins

Using the correction table above and the the tides for both days of the field trip at the **Golden Gate Bridge** (provided in the class syllabus or online), determine what the tides will be at **various beach locations during the field trip.**

Rodeo Beach first field day	DATE:	HIGHS AND LOWS:
Ocean Beach first field **day**	DATE:	HIGHS AND LOWS:
Gray Whale Cove last field day	DATE:	HIGHS AND LOWS:

Marine Rocks & Sediments

Match the rock samples that you can find in San Francisco coastal settings to their names.
PUT SAMPLE NUMBER UNDER CORRECT ROCK NAME
Circle and make notes on rock characteristics sheet that helped you make the identification.
Goal: to identify these rocks during upcoming field trip.

Rock name	Sample # that matches AND DESCRIPTION
Sandstone	
Mudstone or	
Conglomerate or breccia	
Granite	
Chert	
Basalt	
Serpentinite	

BEACH SANDS

In the image to the right, la[bel]
these locations:
Rodeo Beach,
Ocean Beach,
Gray Whale Cove Beach.

Image: USGS

RODEO BEACH OBSERVATION DATA SHEET

Beach sand composition (estimate %) – listed in order from most to least resistant: Quartz | Chert | Magnetite | Feldspar | Shells | Granite | Black nonmagnetic | Plastic/Debris
Beach sand size (estimate %) Mud (<1/16 mm) | Fine Sand | Medium Sand | Coarse Sand | Gravel (>2 mm)

OCEAN BEACH OBSERVATION DATA SHEET

Beach sand composition (estimate %) – listed in order from most to least resistant: Quartz | Chert | Magnetite | Feldspar | Shells | Granite | Black nonmagnetic | Plastic/Debris
Beach sand size (estimate %) Mud (<1/16 mm) | Fine Sand | Medium Sand | Coarse Sand | Gravel (>2 mm)

GRAY WHALE COVE BEACH OBSERVATION DATA SHEET

Beach sand composition (estimate %) – listed in order from most to least resistant: Quartz | Chert | Magnetite | Feldspar | Shells | Granite | Black nonmagnetic | Plastic/Debris
Beach sand size (estimate %) Mud (<1/16 mm) | Fine Sand | Medium Sand | Coarse Sand | Gravel (>2 mm)

How does the **Rodeo Beach** sand compare to **Ocean Beach** sand? Describe similarities and differences below. Facts only, no explanations!

Characteristic	Summary of differences and similarities (do not just restate data – summarize it)
Grain size	
Grain composition	

Based on **grain size and composition** does Rodeo Beach sand feed Ocean Beach? Why or why not?

How does the **GRAY WHALE COVE Beach** sand compare to **Ocean Beach** sand? Describe similarities and differences below. Facts only, no explanations!

Characteristic	Summary of differences and similarities
Grain size	
Grain composition	

Based on **grain size, composition** does Ocean Beach sand feed **GRAY WHALE COVE** Beach? Why or why not?