## What Video Plankton Recorder Data can offer to Herald Canyon Synthesis

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# Locations of VPR Casts



• Fewer casts in 2012. Unfortunately, the VPR was failing and we only have data from 20 of the 38 deployments. This map shows those locations

# Taxa and Particles Identified

#### Year # of Taxa Most Abundant Taxa

2004	9	Algal Mats, Copepods, Diatom Chains, <i>Phaeocystis</i> , Marine Snow
2009	11	Copepods, Cyprids, Diatom Chains, Gelatinous, Marine Snow
2012	10	Copepods, Large <i>Calanus</i> , Diatom Chains, Marine Snow, Larvaceans, Echinoderm Larvae

A different instrument was used in 2004 than in 2009 and 2012. The 2004 instrument was very good at detection of marine snow and other particles but less so at detecting organisms such as copepods

# 2004 HS1



## 2004 HS1 – Net Tow Data vs. VPR Data



## Vertical Distribution of Taxa (VPR 27 on HS1 in 2004)



All show a peak at around 25-30 m, associated with a peak in temperature
The gradient in *Phaeocystis* concentration is extremely sharp.

## Temperature and Salinity



## Plankton Abundances in T and S Space



## Flux or Transport of Plankton and Particles







## Analyses

- Vertical sections of taxa and particles Depth of maximum abundance
- Association of those vertical distributions with vertical structure of the water column
- Association of plankton/particle abundances with hydrography
- Transport of plankton and particles through the Canyon

### We need to identify the questions (at this meeting)

## 2009: HC3 Environmental Variables



- For temperature, 2° C is noted with the heavy white line
- For density, the depth of maximum vertical gradient is shown with the heavy white line to represent the pycnocline
- For chlorophyll from fluorescence, the depth of maximum fluorescence is shown with the heavy white line
- •Very cold water at depth on western end; very warm water near surface on eastern end
- •Fluorescence highest just below pycnocline

# 2009: HC3 Distributions



- Copepods and diatoms most abundant in warmer water; cyprids less so
- Copepods and cyprids found below both pycnocline and fluorescence maximum.
- Diatoms associated with fluorescence maximum and just below pycnocline

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# 2009 HC3 Distributions



- Solid line shows fluorescence maximum; dashed line shows pycnocline
- Copepods and cyprids found below both pycnocline and fluorescence maximum.
- Diatoms associated with fluorescence maximum and just below pycnocline

# 2009 HC3 Distributions



- Copepods and diatoms most abundant in warmer water; cyprids less so
- Copepod depth distribution may have been influenced by time of day

# 2009 HC1 Environmental Variables



• For temperature,  $2^{\circ}$  C is noted with the heavy white line

• For density, the depth of maximum vertical gradient is shown with the heavy white line to represent the pycnocline

• For chlorophyll from fluorescence, the depth of maximum fluorescence is shown with the heavy white line

•The very cold water present on HC3 western end is not present here; very warm water present in upper 25 m across the section

•Fluorescence highest at pycnocline

# 2009 HC1 Distributions



- Lines again show pycnocline (solid) and fluorescence max (dashed)
- Copepods most abundant at pycncline/fluorescence max
- Diatoms most abundant above pycnocline and fluorescence max
- Cyprids not abundant at all; not shown

# 2009 HC1 Distributions



- Line again shows 2 ° C isotherm
- No obvious pattern observed
- All casts conducted at night so no expected diel differences in vertical distribution

#### AutoVPR





# Data Collection

- AutoVPR self contained
- The AutoVPR was mounted on the CTD Rosette
- Data collected on most CTD casts
- Because of pressure rating, no stations >350 m
- Imaged volume ~15 ml





#### Images not to scale

# Data

- Images are extracted from video and identified automatically
- Manual verification of identification is also done
- Data processing is ongoing; mostly completed
- Only down cast data used
- Many thanks to Mark Dennett, Dan Torres, Susan Mills, and Marshall Schwartz for the care and feeding of the VPR