

Video Workshop Proposal

- *Establishing Community Standards for Underwater Video Acquisition, Tagging, Archiving and Access*
 - PIs: Ferrini (LDEO), Coleman (URI), Soule (WHOI)
- Concept presented at 2014 Fall DeSSC Meeting
- Community Support
 - WHOI/NDSF, UW, UNOLS, Harvard, Ocean Exploration Trust, NOAA OER, MBARI, Schmidt Ocean Institute
- Proposal Funded Summer 2015
- Workshop to be held March 2016 at URI

Video Workshop – Steering Committee

- PIs (Ferrini, Coleman, Soule)
- Brian Schlining
 - Monterey Bay Aquarium Research Institute (MBARI)
 - Software Engineer, creator of MBARI VARS system for video annotation data management
- Webb Pinner
 - The Global Foundation for Ocean Exploration (GFOE)
 - Oceanographic Data Management System Architect

Video Workshop Participants

- ~25-35 in-person participants
 - Operators
 - Science Users
 - TV/Video Professionals
 - Data Managers/Metadata Specialists
- Remote participation
 - *Lots* of interest already!!

Video Workshop - GOALS

- Understand current state of video logging & data management across community
 - pre-workshop surveys + presentations
- Summarize technical and science-based needs, challenges, existing & desired solutions
- Community Consensus
 - Formats, logging standards, metadata standards, storage/archiving
 - How to best move forward
- Report to be made available on UNOLS website

Video Workshop Planning

- Target Timeframe: March 21-23, 2016
- Develop list of potential participants
 - Input from DeSSC
 - Invitations out by mid-October
 - Develop Survey(s) in advance of DESCEND2/AGU
- Input from DESCEND2 (Dec. 2015)
- Input from SOI Video Data Management Focus Group (Aug. 2015)

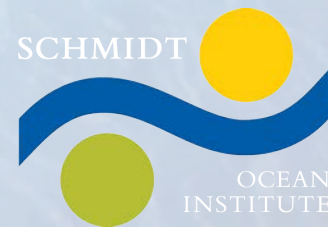
Video Data Management Focus Group

Schmidt Ocean Institute 2015 Planning Workshop

- 2 hour discussion
- August 2015
- 11 International Participants

Vicki Ferrini (LDEO) – *convener*, Ariell Friedman (ACFR), Rayna Jenkins (ONC), Aaron Marburg* (UW-APL), Phil McGillivary (US Coast Guard), Allison Miller (SOI), Logan Mock-Bunting (SOI), Webb Pinner (Capable Solutions Inc.), Brian Schlining* (MBARI), Andy Stewart* (UW-APL), Carlie Wiener (SOI),

**remote participant*



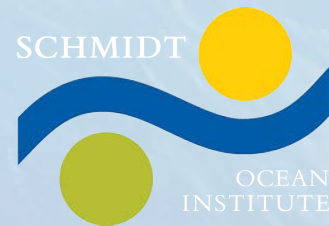
SOI Focus Group: Topics Discussed

- Current Practices
 - Formats, Redundancy, Data Volumes, File Sizes, Frame-Grabs
 - Metadata: Time code, Closed Captioning, Overlays
- Use-cases (incl. machine learning)
- Interfaces
 - VARS, Squidle, SeaTube, OceanVideoLab
- Synergies

SOI Focus Group: Outcomes

- Several experts already working on different aspects of this problem = lots of space for collaborating
 - Code Sharing
 - API standards
 - Data Awareness
- Low-hanging fruit: existing systems can develop common APIs for sharing information
 - 1st: Where has video been acquired?
 - Later: Where have like observations been made?
- Important perspectives to inform 2016 workshop
 - Pre-workshop surveys
- There's lots more to talk about!

OceanVideoLab



oceanvideolab.org

SOI-MGDS Video Annotation

Pilot Project

- Create a searchable online database of underwater video observations
 - Science
 - exploration, ground truth, machine learning, big data
 - Outreach
 - public engagement, quick access to highlight content for outreach efforts
- Enable broad discoverability
 - YouTube (~1 billion users/month)
 - API for accessing tagged information and integrating with other ocean image tagging efforts
 - Link to related data resources that complement imagery where possible (e.g. MGDS)

Technology for Pilot Project

- YouTube
 - Broad Usage vs. Vimeo
 - YouTube ~1 Billion Users/Month
 - Vimeo ~ 100 Million Users/Month
 - Provides API for interacting with content
 - Excellent Performance
 - Bandwidth limitations handled by YouTube
 - SOI live streams to YouTube
- PostgreSQL Relational Database
- PostGIS
- Leaflet Map Interface (GMRT basemap)

OVL – Design

- Registration page for inputting URL to YouTube video
- Accommodate *any* underwater video
 - temporally continuous
 - Online
 - openly accessible
- YouTube Player
- Simple annotation interface
- Integration with map interface and current vehicle position

OVL - Contribute

Explore the
Deep Sea

Search the Video Catalog



OVL - Contribute

Contribute Your Video

Video URL

Start Time (UTC)

[Start Exploring](#)

OVL – Player

OceanVideoLab

Q Search

Annotations

Dive Log


User Annotations

Data Plots

Temperature

Salinity

2015-04-26 20:20:09



YouTube

Scott Reef ROV Dive 9.5 - Falkor

37:39 / 1:19:38

Leaflet | GMRT

Position: 14.044899° S 121.93577° W
Altitude: 2.1 m Depth: 20.8 m Heading: 121°

Annotate

Time	Elapsed Time	Position	Annotation
2015-04-26 19:45:21	02:51	--	Beginning of dive
2015-04-26 19:51:31	09:01	--	Bottom sighted
2015-04-26 19:54:03	11:33	--	A fish
2015-04-26 19:57:52	15:22	--	Anemone spotted
2015-04-26 20:20:09	37:39	--	Fish hiding in a burrow
2015-04-26 20:43:02	1:00:32	--	Another anemone
2015-04-26 20:46:28	1:03:59	--	Interesting coral feature

Linked behavior between annotation, map, video panels

OVL – Annotation

The screenshot displays the OceanVideoLab interface. On the left is a navigation sidebar with options: Search, Annotations, Dive Log, User Annotations, Data Plots, Temperature, and Salinity. The main area is split into two panels. The left panel shows a video player with a timestamp of 2015-04-26 20:52:50 and a progress bar. The right panel shows a map with a blue outline of a reef structure and a location marker. A dialog box is overlaid in the center, containing the following information:

Date and Time of Video
2015-04-26 20:52:50

Elapsed Time
1:10:20

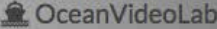
Annotation
School of fish

Buttons: **Submit Annotation** (orange), **Cancel** (black)


Below the dialog box, a table lists video annotations:


Time			
2015-04-26 19:45:21			
2015-04-26 19:51:31			
2015-04-26 19:54:03			
2015-04-26 19:57:52	15:22	--	Anemone spotted
2015-04-26 20:28:09	37:39	--	Fish hiding in a burrow
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OVL - Search









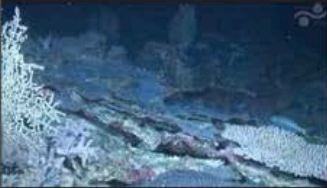



 OceanVideoLab

Platform
ROPOS (87)
Other (124)

Year

1980 - 2015

Depth

0m - 1343m

Related Keywords
Riftia →
Vent →
Hydrothermal →

 Scott Reef Test Dive 2 10 matching annotations	 Scott Reef Test Dive 3 16 matching annotations	 Scott Reef - coral spawning ROV Dive 1.5 15 matching annotations	 Scott Reef Test Dive 16 matching annotations
 Scott Reef - coral spawning ROV Dive 1 13 matching annotations	 Scott Reef ROV Dive 9.5 - Falkor ROV Dive 9.5 10 matching annotations	 Scott Reef - coral spawning ROV Dive 1.7 15 matching annotations	 Scott Reef - coral spawning ROV Dive 2 20 matching annotations
 Scott Reef - coral spawning ROV Dive 3 16 matching annotations	 Scott Reef ROV Dive 4 13 matching annotations	 Scott Reef ROV Dive 5 11 matching annotations	 Scott Reef ROV Dive 6 8 matching annotations

OVL – Strategy & Next Steps

- Short-Term Sept 2015
 - Deploy POC/MVP
 - Develop UI/UX for Contribute, View, Tag, Search
 - Authentication for tagging
 - Presentation at 2016 Ocean Sciences Meeting
- Long-Term
 - Enhance access to related data (plots, map overlays?)
 - Deploy API to enable queries from external systems
 - Expand to Vimeo and/or other players
 - FrameGrabs & detailed tagging within frame
 - Pursue Collaborations
 - Code-share with complementary efforts (e.g. Squidle)
 - Machine Learning & Big Data

Questions?

