

# Content Creation Training

Red – show dataset on sphere, Blue – show on computer, Green – hands-on example

Updated for SOS 5.3

## Part 1 – Definitions

1. **Content** – General term that we use for anything that can be displayed on the sphere and should be stored somewhere in /shared/sos/media - mp4, jpg, png, pip, overlay, label, colorbar...
2. **Dataset** – A packaged collection of coherent content, which may include multiple layers, labels, legends, colorbars, etc...
  - a. **Texture** – A single, static image on the sphere that rotates (Blue Marble)
  - b. **Time series** – animates through time and by default doesn't rotate. Can be an image sequence or a mpeg4
    - i. **Image sequence** – a directory of images that are played in sequence (Real-time: Snow and Ice Cover)
    - ii. **MPEG4** – the only video format accepted by SOS (Global Epidemic and Mobility modeler – H1N1 scenario)
3. **Presentation playlist** – A collection of datasets grouped together in a list for a presentation
4. **Playlist.sos** – A text file that specifies how a dataset should be displayed on the sphere. Each dataset must have its own playlist.sos file

## Part 2 – Useful Information for Creating Content

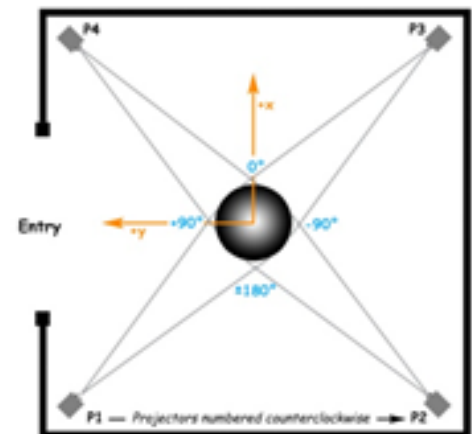
1. Data Organization
  - a. Typically, each dataset has its own folder
  - b. Every dataset from NOAA is stored in one of seven categories
    - i. Air
    - ii. Extras
    - iii. Land
    - iv. People
    - v. Snow and Ice
    - vi. Space
    - vii. Water
  - c. Custom content should be kept in the **site-custom** folder (writeable by all users)
    - i. All of the data from NOAA is synced regularly with the NOAA FTP server, so any local changes will be overwritten.
  - d. Any content that is added to the system should be stored in /shared/sos/media/site-custom
    - i. Do not store any content on the Desktop or in the sosrc playlist directories
  - e. A subcategory should be specified in the playlist.sos file, in order to be able to Browse in the iPad more easily.

## 2. File Format (SOS Coordinate System)

- a. Images need to be plotted using the Equatorial Cylindrical Equidistant (ECE) projection
  - i. An ECE projection is commonly referred to as a simple lat/lon grid, where the image is a standard cartographic map projection that is twice as wide as it is tall (rectangular)
- b. Images in the wrong projection format will project on the sphere, but they will not correctly represent the size of the continents
- c. For textures, **2048x1024** is minimum size, **4096x2048** is recommended
- d. For time series, **2048x1024** is the recommended size
- e. Most common image formats such as JPEG, PNG, GIF, TIF, etc work for textures
  - i. Prefer JPEG or PNG
  - ii. To use layers with transparency, use PNG
- f. For image sequences, the same image formats apply
- g. For videos, the only acceptable format is MP4.
  - i. Render the video with the MPEG4 video codec at a minimum of 25 mbps
  - ii. Be sure to use a constant bit rate
  - iii. H.264 codec can cause errors for SOS when used with a variable bit rate

## 3. Orientation of Data (SOS Coordinate System)

- a. The maps created for SOS should be centered on the Prime Meridian, so that 0°N,0°E is the center of the image
- b. The center of the map loads between projectors three and four with the edges of the map between projectors one and two



## 4. Dataset folder example

([/shared/sos/media/atmosphere/ltg\\_vaisala](/shared/sos/media/atmosphere/ltg_vaisala))

- a. Playlist.sos file
- b. Labels
- c. Colorbar
- d. PIPs
- e. Icons (can also be stored in </shared/sos/etc/AnnotationIcons/>)
- f. Layers (can also be created as a standalone overlay)
- g. Text PIPs

## 5. Naming Conventions

- a. Texture images should be named for their resolution, such as *4096.jpg*.
- b. Image sequences should be kept in a folder named for the frames' resolution
  - i. The frames should sort in ascending order from earliest to latest
    1. Use the date in the name of the file or embed a frame number in the file name, with a sufficient number of leading zeros

- c. Name MPEG4 files with the name of the dataset along with the resolution, such as *currents\_2048.mp4*.
- 6. Dataset Suggestions
  - a. Seams – data should fill the entire frame with no borders and it should match on the edges of the map or a seam will appear (*Global Average Temperature Anomaly 2010*)
  - b. Warping – The least amount of warping occurs near the equator (*NASA Sea Surface Temperatures*)
    - i. Pips that are placed using pipcoords don't warp
    - ii. Pips that are placed with piphorizontal and pipvertical do warp
  - c. Color suggestions – use well-chosen color scales that are meaningful, intuitive, and scientifically accurate (*Global Vegetation*)
- 7. Tools to Create Datasets
  - a. Because Science On a Sphere® uses common image and video formats, you can use many tools to create and edit datasets such as:
    - i. Photoshop
    - ii. FinalCut Pro
    - iii. ImageMagick
    - iv. GIMP
  - b. Tools like IDL, ArcGIS, and other image analysis applications are typically used to create imagery from scientific datasets
  - c. 3D modeling applications, such as 3D Studio, can be used to create advanced visualizations

## Part 3 – steps for adding a new dataset

The Visual Playlist Editor can be used to assemble your datasets!

- 1. Custom folder
  - a. All new datasets created by your site should be in their own folders in */shared/sos/media/site-custom*
  - b. Don't make modifications to folders provided by NOAA
    - i. If you want variations, copy them into your site-custom folder and modify them there
  - c. Icons should be stored with corresponding datasets
  - d. Folder **CANNOT** have the same name as folders already created by NOAA
- 2. All the pieces
  - a. The only two required pieces are image or images/mp4 and a playlist.sos file (*/shared sos/media/astronomy/io/original*)
  - b. Extras that are nice to have include:
    - i. Colorbar
    - ii. Labels

- iii. Layers
- iv. Icons
- v. PIPs
- vi. Text PIPs
- vii. Audio track
- c. Media folder - this contains thumbnails that are 800x800 and 128x128

### 3. Playlist Attributes

- a. Use the Visual Playlist Editor to create playlist.sos files or create them by hand
- b. There are over 50 playlist attributes that are all listed under *Support > Manuals > Playlist Format Reference*
- c. Playlist.sos examples – every dataset must have its own playlist.sos file
  - i. Simple - </shared/sos/media/astronomy/io/original/playlist.sos>
  - ii. Standard - [/shared/sos/media/atmosphere/carbon\\_tracker/playlist.sos](/shared/sos/media/atmosphere/carbon_tracker/playlist.sos)
  - iii. Complex - </shared/sos/media/astronomy/moon/landings/playlist.sos>
  - iv. Multiple Versions and Relative paths - [/shared/sos/media/land/blue\\_marble/blue\\_marble](/shared/sos/media/land/blue_marble/blue_marble)
- d. There are four keywords that are used for only site-custom datasets, and when set, will help with browsing in the iPad;
  - i. creator = name (can be used as a search filter)
  - ii. subcategory = any category word (majorcategory is automatically site-custom)
  - iii. keywords = comma separated list of words
  - iv. description = {{dataset description}} will show up when pressing the info button on the iPad

### 4. Updating the Library and SOS Remote App

- a. In order for new datasets to show up in the GUI Library click “Library” > “Update Library...”
- b. After that step, in the Settings tab in the SOS Remote App, a message should pop up telling you to sync the iPad in order for new datasets to show up. (indicated by a red !)
- i. Tap Settings and then under SOS Data Catalog, tap “Update Now”

### 5. Presentation Playlist - </home/sos/sosrc/normal-demo.sos>

- a. In order to group multiple datasets together, create a presentation playlist, such as hurricanes.sos, that points to each individual playlist.sos file with the full path included
- b. These playlists are to be stored in /home/sos/sosrc or /home/sosdemo/sosrc
- c. Playlists can be typed by hand, created using the Visual Playlist Editor, or generated on the website

### 6. Visual Playlist Editor and Playlist Builder

- a. The Visual Playlist Editor (VPLE) is a piece of software on the SOS computer that allows you to create a playlists, modify datasets, and add new datasets
  - i. There are two modes to the VPLE - Presentation and Dataset
  - ii. The New, Open, and Save buttons work for the mode that you are currently in
  - iii. You can only work on one project at a time. You can't have an unsaved playlist and an unsaved dataset open at the same time.
  - iv. When you edit a dataset in a playlist, you can either save the changes in your playlist, or export the changes to create a new dataset.
  - v. A copy of the catalog is available for finding datasets to add to the catalog along with all the Live Programs
    1. You can also navigate directly to datasets by using the "Add Dataset From File" button below the Dataset Search Results
    2. You can also open existing playlists and pull datasets from them in the Reference Playlist Window
  - vi. In Dataset mode there are four colored buttons that you use to create new datasets by adding Layers, PIPs, Labels, and Audio
    1. Use the five tabs in the left column to customize the dataset to your preference. The software will automatically select which tab it thinks you want based on what you click. The tabs are:
      - a. About
      - b. Global
      - c. Animation
      - d. Description
      - e. Element
    2. You can position labels and PIPs by dragging them around in the preview window and you can watch a flat version of the animation by pressing play.
- b. The SOS website playlist builder allows you to make a simple playlist from any computer that can then be saved to a thumbdrive or emailed to yourself so that you can bring it to the SOS computer
  - i. You can change the name of the playlist from custom\_playlist.sos to whatever you prefer and then save the playlist to a thumbdrive or email it to yourself in order to copy it to the SOS computer
  - ii. The playlist should be stored in /home/sos/sosrc/ or /home/sosdemo/sosrc
  - iii. There is no way to modify datasets with the online playlist\_builder
- c. The Playlist Builder in the SOS Remote App gives you the same functionality as the playlist builder on the website, but it saves the playlists to the SOS computer for you
  - i. It also has an interface for adding presenter notes

## 7. Making modifications – playlist.sos vs presentation playlist

- a. Changes to playlist.sos files will be reflected in all presentation playlists that point to those playlist.sos files
    - i. Think of the playlist.sos file as the master copy for the dataset
  - b. Changes made within the presentation playlist will only be reflected in that playlist.
    - i. When you use the playlist editor, changes you make will affect only your individual playlist that you are editing
  - c. All of the playlist keywords can be used as modifiers in a presentation playlist that will override whatever is in the playlist.sos file.
    - i. **Modify a presentation playlist with the playlist editor**
  - d. All modifications made with the Visual Playlist Editor happen in the playlist.sos file.
- 8. Submitting a dataset to be included in the SOS Catalog
  - a. We work with you to include your new datasets in online SOS Data Catalog with an accurate description and proper credits
  - b. The description should be non-technical and easy to understand
  - c. The “Notable Features” is a bulleted summary of the highlights from the description that presenters can use when showing the dataset to viewers
  - d. The credits include
    - i. Dataset Source
    - ii. Dataset Developer
    - iii. Visualization Developer
    - iv. Contact
- 9. Sharing Datasets (**Frozen**)
  - a. Sites are encouraged to provide the datasets that they create to the NOAA library so that all of the other SOS sites can use them as well

## Part 4 – Examples of the Playlist Attributes

The VPLE Guide Appendix B has a list of the playlist attributes and where to find them in the VPLE:

<https://sos.noaa.gov/support/manuals/visual-playlist-editor-manual/#appendix-b-attribute-descriptions>

- 1. The Details button in the SOS\_Stream\_GUI lists all the attributes of the currently loaded dataset
- 2. There are several keywords that don't impact the display on the sphere
  - a. **name** – choose a memorable name that you can easily find when searching
  - b. **rename** – used in a presentation playlist to note that a dataset has been modified
  - c. **catalog\_url** – used for the Website button on the iPad app
  - d. **include** – used for creating presentation playlists

- e. **category** – identifies how to sort the dataset in the library
  - f. **script** – points to a computer script that is started when the dataset is loaded
3. **Japanese Earthquake and Tsunami** [/oceans/japan\\_tsunami\\_waves/combo/playlist.sos](#)  
**data** = quake\_tsunami\_combo\_2048.mp4  
**firstdwell** = 2000  
**lastdwell** = 3000  
**label** = labels.txt  
**pip** = colorbar.png  
**piptimer** = 53.8  
**pipvertical** = -35  
**pipheight** = 15  
**duration** = 63.65 *\*set this to be slightly less than the length of the audio file*
  4. **September Sea Ice Levels from 1987 – 2013**  
[/oceans/WeeklySeaIce/sept\\_seaice/playlist.sos](#)  
**animate** = 0  
**fps** = 3  
**tiltx** = 90
  5. **2005 Hurricanes – Rita with Audio**  
[/atmosphere/2005\\_hurricanes/grayer/playlist\\_audio\\_rita.sos](#)  
**startframe** = 10127  
**endframe** = 10868  
**audio** = audio/rita.mp3  
**timer** = 34  
**layereast** = 360  
**layerwest** = 0
  6. **GLAPS day/night temp comp**  
[/extras/live\\_programs/wind\\_water/day\\_night\\_comp/playlist.sos](#)  
**pipcoords** = 71,-157  
**pipstyle** = globe  
**labelColor** = white  
**layer** = Ocean Mask  
**layerdata** = ocean\_mask.png
  7. **Hurricane Isaac Radar over Satellite 8/20 - 9/3/12** [/atmosphere/Isaac/playlist.sos](#)  
**layeralpha** = .5
  8. **Lightning Detection by Vaisala** [/atmosphere/lgt\\_vaisala/playlist.sos](#)  
**icon** = lightning.png

9. Moon with Apollo and Surveyor Landing Site Pictures

[/astronomy/moon/landings/playlist.sos](#)

**pipalpha** = 0.95  
**pipfadein** = 2.5  
**pipfadeout** = 2.5  
**pipdelay** = 10  
**layervisible** = no

10. Deepwater Horizons Oil Spill August 2 [/oceans/oil\\_spill/playlist.sos](#)

**piphorizontal** = 10  
**pipfps** = 30

11. 2012 Hurricane Season [/atmosphere/2012\\_hurricane/playlist.sos](#)

**skip** = 1  
**stopframe** = 195  
**zrotationenable** = 1  
**zfps** = 20

**Part 5 – hands on examples (Files needed for hands-on examples are in SOS Training drive folder “*content training pics*”)**

All of these examples should be created in [/shared/sos/media/site-custom](#) folder

1. Adding a museum logo to new category for museum (need logo.png)
2. Slideshow of pips (need plates, gif, seafloor\_spreading.jpg, Convergent\_Boundaries.jpg, san-andreas-fault-map.jpg)
3. Autorun dataset with pip mp4 and audio (need tsunami\_footage.mp4)
4. Archiving realtime data (whatever is most relevant for site - grab all folders)
5. Layering two datasets (fimchem & nightlights and pip as layer)