SOUTHERN CALIFORNIA ASSOCIATION OF MARINE INVERTEBRATE TAXONOMISTS

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Ysideria hastata - Photo by Ricardo Martinez-Lara

This Issue

10 MAY 2010, SCAMIT DNA BARCODING IDENTIFICATION WORKSHOP, LACSD.

The DNA Barcoding workshop was well attended with many POTW, SCCWRP, and NHMLAC staff participating. Attendees were: Don Cadien, Larry Lovell, Lily Sam, Dan Ituarte, Kathy Langan, Katie Beauchamp, Megan Lilly, Nick Haring, Ricardo Martinez-Lara, Ron Velarde, Wendy Enright, Tony Phillips, Kristin Meagher, Kathy Omura, Leslie Harris, Christina Thomas, Kelvin Barwick, Ken Sakamoto, Mike McCarthy, Peter Miller, and Valerie Raco-Rands.
President, Larry Lovell, opened the meeting with SCAMIT business, upcoming meetings, and announcements. He then introduced Dr. Peter Miller from SCCWRP.

UPCOMING MEETINGS

13 June 2011 - at the NHMLAC, 9:30-3:30. Oligochaetes with Dr. Joshua Mackie CSUSJ.

July 2011 - no meeting is scheduled as this is a busy field month for local POTW staff.

15 Aug 2011 - at SCCWRP in the large conference room, 9:30-3:30. Morphbank image submittal workshop. Deb Paul, Morphbank FSU, will visit us to lead another workshop on Morphbank image submittal.

12 September 2011 - at Lilly Pad Environmental, Escondido, CA (directions to Megan's address to follow), 9:30-3:30. Megan Lilly and Tony Phillips will lead a workshop on Enteropneusta. Those who plan to attend are asked to use their July field sampling events to pull specimens for special handling and preservation during collection. That way materials in excellent condition will be available for the meeting. We hope to improve the level of identification for this group.

Peter presented a Powerpoint presentation with an overview of the SCCWRP DNA barcoding project. He outlined the long-term objective of building a library of barcodes for offshore benthic species to support whole sample barcode analysis as a bioassessment tool. He presented the rational for using CO1 as a preferred genetic marker, being a mitochondrial gene and having about 650 base pairs. Examples of the Guelph data input spreadsheets for field collection, species identification, well-plate tracking, and image information that will be used during the workshop, were projected and discussed. Peter introduced Valerie Raco-Rands who has been assigned to work with him on the project. He expressed his appreciation for the field efforts of the POTW's for collecting the samples and making them available for processing.

Larry then oriented everyone to the layout of the room and workflow proposed for the day. Participants were assigned or volunteered to work at the duplicate taxonomy, photography, well-plate tissue pulling, and computer spreadsheet input stations. Following tissue pulling, the labeled voucher specimens were given to the NHMLAC staff on hand for curation.

Sorted samples in 95% EtOH from SCCWRP (Bight '08), LACSD, CLAEMD, OCSD, and CSD were available for processing. Taxonomists covering all major taxa began pulling specimens that were easy to identify, labeling them and passing them to the photography station. One or more photographs were shot of each specimen, then the specimen was moved to the DNA tissue pulling station where a piece of tissue was removed and placed in the appropriate well-plate hole. The information for a specimen was then passed to the computer station where the information relating to that specimen was entered into the spreadsheet. The vial with the specimen was passed to the NHMLAC station where it was properly archived and curated by museum staff. A total of ninety-six specimens were processed at the workshop. Barcode results will be forthcoming and available at BOLD.

This workshop was an opportunity for SCAMIT members to see first hand the complete steps in DNA barcoding specimen handling, from identification to museum curation. It also allowed us to make some initial progress toward building the DNA barcode library of Southern California benthic invertebrates.

14 JUNE 2010, SCAMIT IMAGING WORKSHOP, CSD – D. Ituarte

The purpose of this workshop is to demonstrate methods of capturing, organizing, and editing your images with the least effort, and with non-destructive methods. Several programs are recommended including Adobe Photoshop, Adobe Bridge, Adobe Camera Raw, Nikon Capture NX2, Adobe Lightroom, and Apple Aperture.

Introduction

William Henry Talbot was the inventor of photography using silver, and the negative to positive method of printing. Being a botanist and a scientist among other things, some of his first images were of plants. It was his goal to find a method of creating images that could be transferred to ink and used for documentary purposes. He perfected the optical and chemical aspects of photography, and learned to use the new medium to make complex images for the botanist, historian, traveler, and artist. As a botanist, Talbot clearly wanted to use his invention as a method for literary and taxonomic documentation. He stated: "Had early botanists been able to print fifty copies of each engraving, and had they sent them to distant colleagues, it would have greatly aided modern botanists in determining the plants intended by those authors, whose descriptions are frequently so incorrect that they are like so many enigmas, and have proved a hindrance and not an advantage to science." He only partially succeeded in his quest to use photography for documentation. However, these goals would be met by other photographers such as Karl Blossfeldt who used photography specifically for documentation of species of plants. His images were carefully lighted and photographed, printed with high quality, and documented with taxonomic information. The quality of his images should be used as an example of what we can and should attempt to achieve for taxonomic documentation of species. Today, we have superior equipment and software to achieve such quality. For more information on Talbot see: "William Henry Fox Talbot: [Dandelion Seeds] (2004.111)". In Heilbrunn Timeline of Art History. New York: The Metropolitan Museum of Art, 2000-present. http://www.metmuseum.org/toah/works-of-art/2004.111

Understanding Light

Color Temperature and the White Balance Mode in Digital Cameras

Color temperature is a standard method of describing colors for use in a range of situations and with different equipment. It is normally expressed in units called Kelvins (K). Color temperature means the temperature of an ideal black body radiator at which the color of the light source and the black body are identical (Jensen 2000). A black body is a theoretical radiator and absorber of energy at all electromagnetic wavelengths. When a black body is heated it emits color as it gets hotter. The first colors are red and yellow and eventually blue (Hirsch 1989). Digital cameras generally correct for color temperature when set to automatic balance. Daylight outdoor temperatures are blue and have temperatures of 5000 – 6500 degrees Kelvin. Tungsten light temperatures can vary from 2500 to 3500 degrees Kelvin. Setting the camera to 5000 K (daylight) while shooting indoors will result in a yellow cast. If the automatic features of the camera do not completely correct for white balance while photographing invertebrates with tungsten lighting, the result will be a yellow image. Fortunately, imaging programs such as Adobe Photoshop,

Adobe Lightroom, and Capture NX2 can correct for color temperature. Color casts caused by color temperature can also be corrected using either lens filters or a different light source. Flash units produce daylight color temperatures (5000 degrees Kelvin) and reduce the need for significant color correction when setting the camera to automatic white balance.

Color Theory

Three principal types of cones in the eye are sensitive to red, blue and green light (De Grandis 1986). These primary colors produce new colors when mixed additively. The sum of two colors with similar spectral wavelengths of light gives a color midway between the two. In order to identify the wavelength of a given color and its degree of saturation, reference is made to a flat, horseshoe-shaped diagram, proposed and worked out by the **Commission internationale de l'éclairage** (CIE) in 1931. The "horseshoe" represents the pure (spectral) colors, and inside it all the non-spectral colors that are physically possible for the human eye to see. In the center is the position of the white light - the light supplied by the source. This is the "chromaticity diagram" or the CIE triangle. Color temperatures can be correlated with those of the CIE triangle. This triangle is sometimes referred to as the color gamut of the human eye. See Fig. 2 (also see *www.**adobe**.com/digitalimag/pdfs/phscs2ip_col**space**.pdf*).

Color Working Space

The colors produced by video, television, photography, cinema and printing are found within the CIE triangle. Adobe RGB (1998) and sRGB are two of the most common working spaces used in digital photography (Eismann and Duggan 2007). sRGB is an RGB color space proposed by HP and Microsoft because it approximates the color gamut of most common computer display devices and serves as the color gamut of the typical monitor. It has become the standard color space for displaying images on the internet. sRGB's color gamut encompasses just 35% of the visible colors specified by CIE and is therefore one of the narrowest gamuts of any working space. It is broad enough for most color applications, but it is less than ideal for producing high quality images.

Adobe RGB (1998) was designed by Adobe Systems, Inc. to encompass most of the colors achievable on CMYK printers and is the most recommended color gamut of default color spaces (Eismann and Duggan 2007). The Adobe RGB 1998 working space encompasses roughly 50% of the visible colors of the CIE.

A much larger working space is ProPhoto RGB developed by Eastman Kodak as a way to describe all of the highly saturated colors that could be produced by E6 transparency films (Eismann and Duggan 2007). This color gamut is a good choice when working with RAW digital files because it is much larger than Adobe RGB and contains nearly all of the colors in the visible spectrum as well as some colors beyond it. While Adobe RGB (1998) will clip some of the more saturated colors captured in a raw file, ProPhoto RGB will tend to keep these colors since they are encompassed within the boundaries of its gamut. However, ProPhoto requires 16-bit files to ensure correct colors, and therefore should not be used with 8-bit files such as jpegs. Adobe RGB (1998) is a better choice for smaller files.

Additive and Subtractive Colors

An additive color model involves light emitted directly from a source or illuminant of some sort. The additive reproduction process uses red, green and blue light to produce the other colors (Hirsch 1989; Eismann and Duggan 2007). These are the primary (RGB) colors and are the colors used on monitors and cameras. Combining these additive primary colors in equal amounts produces the secondary CMY colors cyan, magenta and yellow. Combining all three primary

colors in equal intensities produces white as shown in the center of the RGB color diagram. Varying the luminosity of each color eventually reveals the full gamut of those three colors. The CYM colors are subtractive colors and in varying amounts subtract luminosity from the opposing primary colors. For example, yellow subtracts luminosity from blue, magenta subtracts luminosity from green, and cyan subtracts luminosity from red. Equal amounts of the CMY colors subtract all white light resulting in black as shown in the center of the CMY color diagram. The CMY colors are generally used for printing and are referred to as CMYK colors. The K stands for the small amount of black ink needed to produce a true black rather than a dark brown color. It is important to understand these color processes when working with imagery programs such as Photoshop. Color casts are created when one or more of these colors vary from those of the original subject matter or color temperature. See Fig. 3.

James Clerk Maxwell and the Tartan ribbon

These principals of additive color were first applied to photography by James Clerk Maxwell. He is credited as being the father of additive color (Hirsch 1989). He and Thomas Sutton photographed a tartan ribbon three times, first with red, then green, and then blue color filters over the lens. The three images were developed and then projected onto a screen with three different projectors, each equipped with the corresponding red, green, or blue color filter used to make the image. When brought into register, the three images formed a full color image, thus demonstrating the principles of additive color. This process is similar to that used in color slide film and digital imagery. Those of you who are familiar with channels in Photoshop may recognize this process of merging black and white images with brightness values for red, blue and green to produce a color image.

Color Theory and the Digital Camera

Capturing Light in Digital Cameras

Digital cameras apply the same color theory used by Maxwell and Sutton to produce a color image of the tartan ribbon. Two extremely mainstream digital imaging technologies are the Charged Coupled Device (CCD) and the Complementary Metal-oxide-semiconductor (CMOS). They are the imaging sensors that appear in nearly every type of digital camera on the market today. Although these two systems have a very different architecture they essentially capture photons and produce digital values. Kudenov (2003) describes the CCD as consisting of an array of small cells or pixels. Inside these cells are tiny photosensitive devices. These small devices are designed such that they will behave like “buckets” that will collect a charge and hold it until it is drained out of the system (i.e. it is directly analogous to a capacitor). These cells are created out of a semiconducting material that will give off free electrons when a photon of light strikes its surface. The more photons that hit the cell (i.e. the brighter the light for a given amount of time), the more electrons there are in the bucket; however, these cells are only sensitive to the light’s intensity, not its color. Therefore the sensor is only detecting brightness values for filtered light – not a color. Brightness values are between 0 and 255 or one byte. These are the same brightness values used in levels and curves of Photoshop and other imaging software. To see a typical layout of a CCD device see the web page for Mike Kudenov:
http://ffden-2.phys.uaf.edu/212_fall2003.web.dir/Mike_Kudenov%20/ccd.htm

The CCD devices are arrayed on a plate similar to the film plane of a film camera. The cells consist of alternating colors of red and green, and blue and green such that there is a pattern of red, green, blue, green cells within a given rectangle of cells. Thus, there are 25% more green cells. This excess of green is advantageous, as our own eyes are much more sensitive to the color green than they are to blue and red. Also, blue tends to have more camera noise, red generally

has more contrast and green is between blue and red for both properties. The light intensity for each group of four sensors (red, green, blue, green) is registered inside the software of the camera. These intensities are then merged together to form a single pixel. The plate or film plane containing all the CCD sensors produces a color mosaic of the image being photographed.

Mosaicing and Demosaicing of Files

To produce a colored image the filtered pixel data must be run through an interpolation algorithm, which calculates the correct color for each pixel by analyzing the color of its filtered neighbors. If a pixel is white with a value of 100 percent, the probability of surrounding pixels being white is high. However, there can be a sudden change of color in an image if there are objects with sharply defined color. To help average out the colors from pixel to pixel and therefore improve the chances of an accurate calculation, digital cameras contain a special filter that blurs the image slightly, thus gently smearing the color. However, this blurring is not so great that it cannot be corrected in software (Long 2009; Young 2008). This process of interpolation is called demosaicing and is derived from the process of breaking down the chip's mosaic of RGB-filtered pixels into a full-color image. Because the camera's ability to accurately demosaic has a tremendous bearing on the overall color quality and accuracy of the camera's images, demosaicing algorithms are closely guarded secrets (Long 2009).

A final image from the digital camera consists of three separate color channels, one each for red, green and blue information. Just as in Maxwell's and Sutton's experiment, when these three channels are combined, you get a full color image. The colors are then mapped to a color working space to ensure consistency of colors. Usually this is sRGB or Adobe RGB (1998). The larger the working space, the more colors your camera can capture. Advanced DSLR cameras generally allow you to choose a working space in the menu. Or, it can be changed later in programs such as Adobe Camera Raw (Photoshop CS3 or higher), Adobe Lightroom, and Capture NX2. Also, color temperature or white balancing is processed after the image has been demosaiced. It can also be changed later in these same programs. The image is then written to a file along with an Exchangeable Image File (EXIF) that contains all relevant information including all the exposure settings of the camera as well as date and time.

File Types

The most common file types used in cameras are jpeg (Joint Photographic Experts Group), tiff (tagged image format file) and Raw files (digital negatives). Earlier digital cameras offered the choice of using jpeg or tiff files. However, there is no advantage to using tiff files within the camera since both file types are only 8 bit in the camera. Jpeg files can now have a bit depth of 24 colors while tiff files can have 32 bit color and in some cases up to 64 bit color: http://www.library.cornell.edu/preservation/tutorial/presentation/table7-1.html

Furthermore, jpegs are not meant to be used as permanent files. They are called lossy files because they are uncompressed when opening and compressed when closing and lose some quality with each event of opening the file from a hard drive. They will degrade significantly with repeated use. Jpegs saved on a CD or DVD will not lose quality as long as the disk is not re-writable. All other files types are generally lossless files.

Jpeg files can be processed rapidly within a camera and use much less memory. Tiff files slow down the processor, use a lot of memory, and produce only an 8 bit file (Young 2008). Raw files can be set to 12 or 14 bit color within the camera such as the Nikon D300. These files use

more memory than a jpeg file, but much less than a tiff file. The raw image is later processed in a separate computer program such as Adobe Camera Raw, Lightroom or Capture NX2. Once processed, the file can be converted to a 32 bit file in Photoshop or a similar program. The original raw file is not altered in the process.

Below is a summary of advantages and disadvantages of using jpeg, tiff and raw files.

JPEG Files (Joint Photographic Experts Group)

Advantages

- Jpegs are small upon compression and use little storage space.
- Most programs can process jpegs.
- Jpegs are the best format for web pages, emails, and cameras where size and speed are important.

Disadvantages

- Jpegs are generally only 8 bit files.
- They lose quality in fine detail as a result of compression upon saving and this data cannot be recovered.
- Jpegs offer less range of colors and tones.

TIFF (Tagged Image File Format)

Advantages

- Tiff files use lossless compression.
- File format is good for saving files for output, and when you need to integrate files in designs that use other software programs.
- Tiff files generally offer up to 32 bits of information.

Disadvantages

- Not as flexible as raw files.
- Tiffs are often slow in cameras and require much more memory than jpeg or raw files.
- Most cameras only offer 8-bit tiff files offering no advantage over raw files.
- Tiff files are demosaiced into three-channel color images requiring them to store three 8-bit numbers per pixel.
- Most high quality jpeg modes on most cameras are very good. You won't be able to discern the difference between the jpeg and tiff images. So, the sacrifice of extra storage space is of little value.

Raw Files (Digital Negatives)

Shooting raw files - the camera collects the data, amplifies it and writes it to a memory card along with the EXIF file. You can then take the raw file and process it in software to create a usable image. So, instead of letting the camera make computations, you move the file to a computer where you have more control of the computations and a few more settings. The demosaicing algorithms in these programs are more powerful than those of the camera and can yield a better image.

Other Advantages with Raw files and Raw Converter Programs:

- You can also choose the color working space.
- You can change the color temperature more accurately.
- The programs offer more settings for gamma, contrast and color adjustments.
- There are more controls for noise reduction and sharpening.

- Raw files can be written as 8 bit, 12 bit or 14 bit files. Jpeg files can only be written as 8 bit. Therefore there is less likely to be loss of information with raw files.
- You can save the file as raw, 8 bit jpeg or 16-32 bit tiff.
- Raw files are not altered in the programs and act like a negative.
- Raw files are much smaller than tiffs.

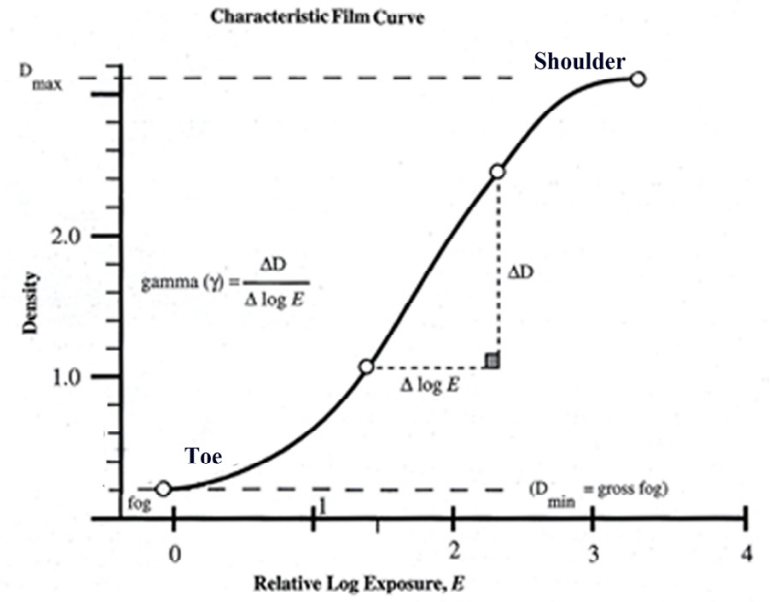
Disadvantages of Raw Files

- Raw Files are big. They can take 3 times the storage space of a jpeg.
- Special programs are needed to read and process raw files.
- Each camera manufacturer creates a profile for each model. The programs must have that profile in order to read the file.

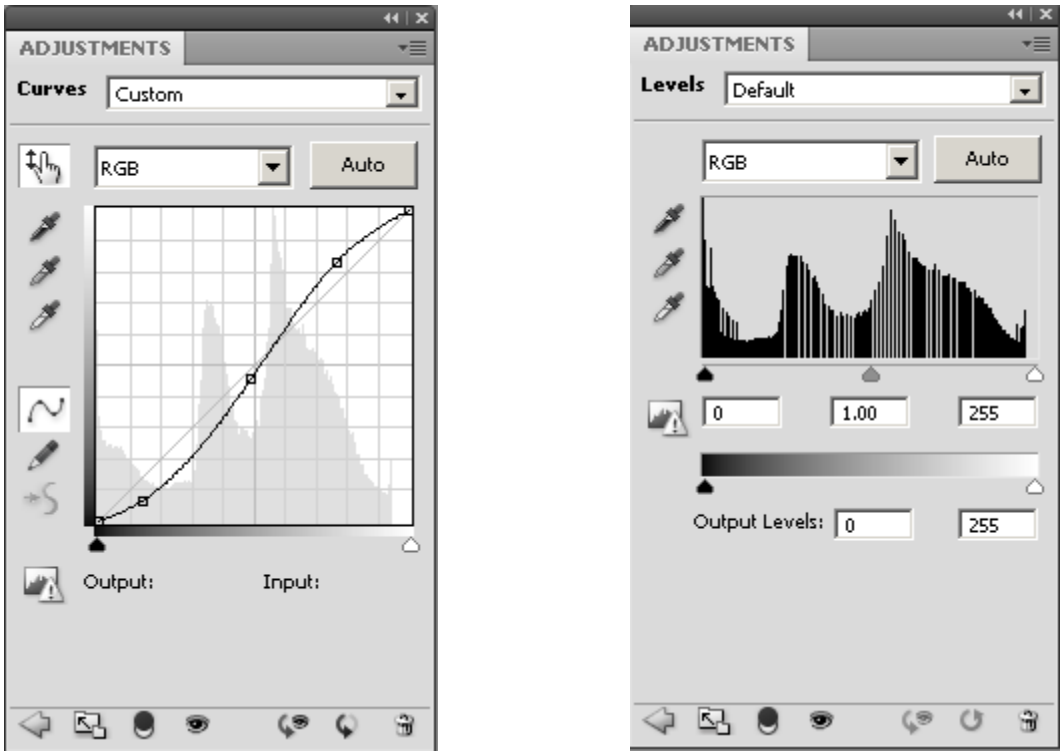
Film Curve and Gamma

The curve and levels adjustment tools in Photoshop are related to the film curve shown below. The fog area indicates a level where not enough photons hit the film to activate a response from the silver crystals (analog). The toe includes the Dmin area where enough photons have hit the film to start to activate a response from the silver halide. However, there is little or no detail in the toe. The deep shadows in the image of Arches National Park are represented by this area. See Fig. 1.

The shoulder contains the Dmax where the silver has been saturated with photons and will no longer respond resulting in pure white areas with little or no detail. The brightest areas in the Arches image are the clouds and represent the shoulder portion of the curve. Gamma is the middle of the curve and is defined by the equation for difference in Density (delta D) divided by the difference in log of Exposure (delta log E). This is also called middle gray or mid-tones. Film and digital cameras are better at separating tones in this region. The gamma controls of levels and curves are used to control the mid-tones.



In digital cameras the silver halide crystals are replaced by CCD or CMOS sensors. Each sensor creates a voltage (analog value) that is relative to the amount of photons striking the sensor. This voltage is translated to a brightness (digital) value ranging from zero (pure black) to 255 (pure white). In Photoshop these values are represented in the Curve and Levels Tools in a manner that mimics the film curve (see below). The histogram found in both tools represents the frequency of occurrence of pixels with brightness values between zero and 255.



The curve tool (left) most closely represents the film curve. The levels tool represents frequency of occurrence of pixels for each brightness value and is similar to the exposure control of a digital camera.

Monitor Calibration

Colors can vary between devices such as the camera, the monitor and the printer. For this reason it is important to manage the monitor with color calibration and color profiles. Many digital cameras now allow the user to select a color working space such as Adobe RGB (1998) described previously. Working in the same color space in Photoshop will help standardize the colors. However, if the monitor is not calibrated this can result in differences in how the colors are interpreted relative to the camera, printer, and other devices. Mac computers come with a built in calibration tool called the Display Calibrator Assistant. Windows does not have calibration software, but the Windows versions of Photoshop include an Adobe Gamma utility. This utility used to be readily visible in the Windows Controls panel. In newer versions of Photoshop (CS3 – CS5) the user must now make a copy of the utility from the Adobe program folder to the control panel. Descriptions of how to do this can be found on the web. In Google search for "Adobe Gamma Installation CS3" and you will bring up notes from an Adobe application forum from ObjectMix.com with steps for installing Adobe Gamma. However, these programs rely on the user's eye and subjective interpretation of middle gray as well as pure red, blue and green colors. Accurate monitor calibration can be achieved by using one of several monitor calibration devices. X-rite makes a variety of calibration tools that range in capabilities and price. The Pantone

hueyPRO is the simplest device followed by the i1Display and the ColorMunki. The i1Dislplay is a good choice for most users. For calibration of the monitor and printer the ColorMunki is a great tool for graphic artists who like to print their own material. It comes with software that enables the user to create custom profiles for different papers. Otherwise, most papers have a profile that can be obtained through the manufacturer or distributor.

These color calibration tools allow the user to set the color temperature, gamma (output contrast), black and white points, and profile (see color working space) for your monitor. In all cases the listed X-rite monitor calibration tools have a default setting of 6500K for color temperature and a gamma of 2.2. The Mac has a default gamma of 1.8 but has better contrast when set to a gamma of 2.2. The Windows monitor is normally set to a gamma of 2.2 giving a flatter image. I found that my current LCD monitor has improved contrast with a gamma of 2.4. Additionally, the software places an icon in your Windows Tray or Mac Dock that allows you to change the setting based on the color profile created by the software. For information on these tools visit http://www.xrite.com. In addition to the monitor calibration tool I currently use an X-rite Passport ColorChecker to create profiles to calibrate my images and correct for minor errors in the color temperature settings of my camera. The white light settings are often not exactly perfect. However, by creating profiles for the images taken in a given environment I have more confidence in the reproduction of true natural colors on my computer screen. For a more thorough explanation of the purpose for **monitor gamma correction** see Wikipedia using the key words in bold or visit the Adobe Press URL below.
http://www.adobepress.com/articles/article.asp?p=1315593&seqNum=5

Workflow Programs
Workflow programs allow for the review of multiple images, library management, metadata management, and non-destructive editing of images. All of these programs have a least some capability for editing raw files. The most notable of these programs are Adobe Lightroom, Adobe Bridge (contains Adobe Camera Raw plug-in), Apple Aperture and Nikon Capture NX2. Capture NX2 supports only Nikon raw files. All others support raw files for nearly all cameras.

Workflow programs do the following:

- Import images
- Organize and rename files
- Add metadata
- Sort and compare imported images to find “pick” images
- Edit and pick images
- Output
- Archive

These programs generally have several components:

- Tool palettes
- Browser
- Editor
- Metadata
- Folders and file manager

Demonstration of Adobe Bridge and Adobe Camera Raw.
The power of Adobe Bridge, Adobe Camera Raw, and Nikon Capture NX2 were demonstrated at the workshop. However, it would be difficult to do justice to these programs in a newsletter. Fortunately, Adobe provides learning movies that describe the advantages of their products. To see the advantages of using Adobe Bridge go to the following website to see movies that show some of the many features of this product. We are planning to create pdf files and movies at a later time that will demonstrate the use of some of these features to create images of invertebrates.
http://tv.adobe.com/show/learn-adobe-bridge-cs5/

A fairly new plug-in program that comes with Photoshop CS2 – CS5 is Adobe Camera Raw (ACR). This tool first appeared in CS2 and was simple in design. But, it has developed into a powerful tool in CS5 that can now be used with jpeg and tiff files as well as raw files (digital negatives). And, you can convert files to an Adobe generic raw file or ".dng" file that requires less memory. In ACR you can control nearly every aspect of film editing including such items as overall exposure, color, sharpness, lens distortion, color temperature, and black and white points. In some cases you can do all of your editing and corrections before opening the image in Photoshop. Go to the URLs below for a demonstration of ACR
Adobe Camera Raw (ACR) Plug-in
http://tv.adobe.com/search/?q=adobe+camera+raw

For a demonstration of the overall power of ACR start with - GS-08: Making a Ho-Hum Raw Image Great.
http://tv.adobe.com/watch/visual-design-cs5/gs08-making-a-hohum-raw-image-great-

Non-destructive Editing with Photoshop Layers
One of the primary advantages of Photoshop is the ability to create multiple layers of edited material for a single image. These layers allow the user to make several changes to an image without committing them to a final edit. The user can therefore accept, reject or edit any layered features without having to start from scratch. The background image is locked at the start of the edit and is used for before and after comparisons with layered edits. For a demonstration of the power of non-destructing editing with layers visit the URLs below.
Using Layers in Photoshop CS5
http://tv.adobe.com/watch/peachpittv-for-designers/photoshop-studio-with-bert-monroy-lesson-on-photoshop-layers

Using Layers in Photoshop Elements
http://tv.adobe.com/watch/learn-photoshop-elements-9/working-with-layers

Capture NX2
Capture NX2 was created by Nik Software for Nikon and is designed to specifically edit Nikon raw (NEF) files. However, this program can also edit jpeg and tiff files. It is a non-destructive editor that has many of the same functions as Adobe Photoshop and Adobe Bridge. Its real power is in the use of a patented feature that creates control points. These control points allow for changes in hue, saturation, brightness, contrast, red, green, blue and warmth of an image with a single click. The masking is so seamless that zooming in on an area where the color has been altered reveals no tell tale line of pixels that are apparent even in Photoshop CS5. This is done with behind the scenes masking. For a demonstration of some features in Capture NX2 go to the URL below.
http://www.capturenx.com/en/lessons/color/index.html

Color Efex Pro and Silver Efex Pro

Color Efex Pro and Silver Efex Pro were also demonstrated at the meeting. These plug-in software products are designed by Nik Software for Photoshop, Capture NX2, Adobe Lightroom and Apple Aperture. Color Efex Pro is a set of filters that essentially eliminates the need to carry a set of lens filters while shooting. Several filters allow for the creation of dynamic effects and color correction. They offer more control of intensity of the filter and can be painted on to specific areas or applied to the entire image.

Silver Efex Pro is a black and white conversion program that adds a film grain to the image. There are a variety of films to select from, and the grain can vary from fine to coarse. Additionally, the photographer can choose one of a variety of black and white film processing and printing styles. For more information visit the URL for Nik Software: Nik Software http://www.niksoftware.com/index/usa/entry.php

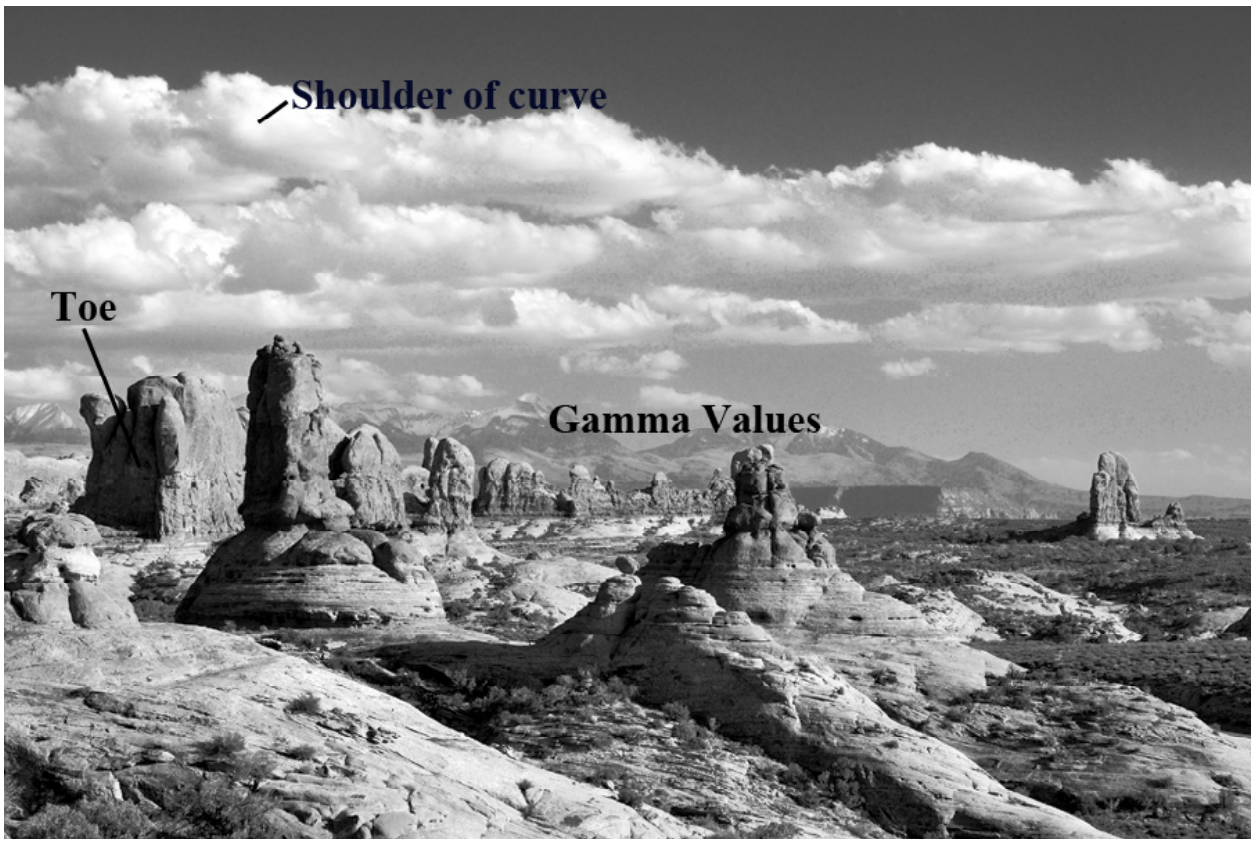


Fig. 1 - Arches National Park, October 2008. Photograph by Dan Ituarte.

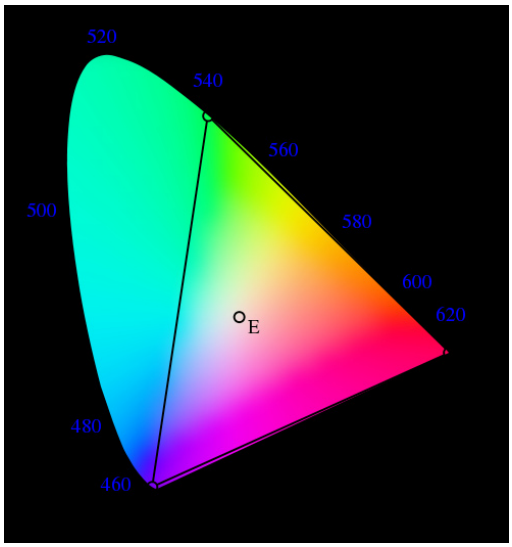


Fig. 2 - Gamut of the CIE RGB primaries and location of primaries on the CIE 1931 xy chromaticity diagram. E represents the location of the light source and is pure white (De Grandis 1986).

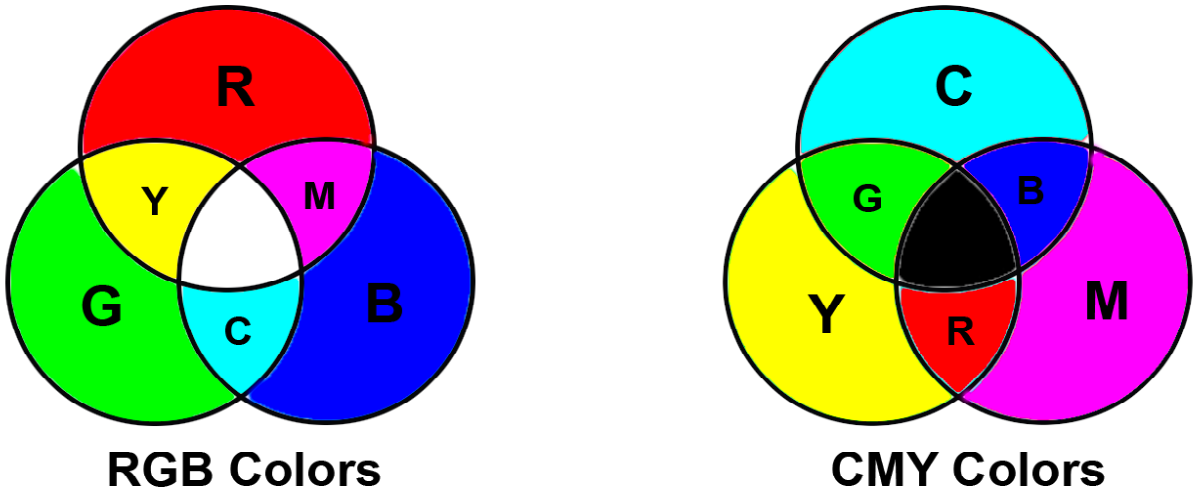


Fig. 3 - The primary colors red (R), blue (B) and green (G) added together in equal amounts produce white as shown in the center of the RGB diagram. Overlapping of RGB colors produces magenta (m), cyan (c) and yellow (y). The secondary CMY colors are subtractive from the primary RGB colors. In equal amounts CMY subtract all white light resulting in black as shown in the center of the CMY diagram. Overlap of the subtractive colors produces variations of the additive colors.

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JULY 2010

There was no meeting held in July due to it being a busy sampling month for many of the local POTW's.

2 AUGUST 2010, SCAMIT DATABASE, SCCWRP

Attendees: Larry Lovell, Kelvin Barwick, Dean Pentcheff, Karen Stocks, Don Cadien, Peter Miller, Cheryl Brantley, Ron Velarde, Wendy Enright, Ananda Ranasinghe; (remotely) Dot Norris, Deb Paul, Phil Goldstein, Katja Seltman.

The meeting was opened by Larry, he stated that the next few SCAMIT meetings will be Bight'08 QA meetings.

Kelvin announced that his Aplacophora images have been successfully submitted to Morphbank. You can now go to Morphbank and search for "Chaetoderma", for example, and you can view all the images for that taxon. The process is still under review for many members and Larry would like to have another workshop next year in the hopes of getting more images submitted.

The SCAMIT website is slowly but surely being filled with voucher sheets and newsletters. The new Google search tool is in place and it is making location of relevant tidbits in these areas, MUCH easier.

Philip Goldstein from OBIS was attending remotely. He has a great interest in our dataset, especially metadata associated with collection of the species in the list. He will interface with Shelly Moore, Katja, Deb, and Dean to set up appropriate portals.

Karen Stocks reported on the literature database project. It didn't really work out the way we had hoped. At this point it is difficult to say whether we should build on the students' efforts or start from the beginning.

Next the process of updating the Ed5 species list was discussed. Shall we do it before the database goes public or shall we use our new processes to do it? It was decided that we need to do our editing the old fashioned way so we can clean up the behind the scenes issues. It will be important to formalize how we do these emendations in order to create a framework for Katja to use in future electronic-only usage.

The following people are the proposed standing committee for final approval of species list edits: Leslie Harris, John Ljbenkov, Ron Velarde, Megan Lilly, Tony Phillips, Don Cadien, Kelvin Barwick.

Peter Miller then had the floor and spoke on uploading photos to both Morphbank and BOLD. One question that arose is how to track changes to the information after it is submitted? Can BOLD acquire data from Morphbank dynamically? Another idea is to start a list on a web-server to track what specimens SCAMIT has sampled for DNA and whether they have associated photos. One idea that was suggested was to use Google docs spreadsheet for easy on-line publishing.

Ananda spoke next and gave a BATMAN update. For the most part the p-codes are reconciled among the major players. The next step will be independent calculations to see if everyone arrives with the same number. Next up are p-codes for bays/estuaries, as well as potential geographic expansion north.

It was then requested that members be on the lookout for voucher sheets, handouts, newsletters etc that are not digitized. If you notice something missing, please scan them and send them to Dean Pentcheff: pentcheff@gmail.com

Next we addressed some issues that needed Katja's attention:
- navigation within the species – page expires; nowhere to go with family link; need author in line with primary Genus species; no hourly stamp with date stamp necessary; how is the list being sorted; issues with Morphbank search in its current format; how online updates are shown, etc.
As for access rights and privileges: Public – they can view all but no edits or revisions; Members – can submit revisions; Superusers – can accept revisions
What was evident at the end of the day is that there is still more to do…

23 AUGUST 2010, SCAMIT BIGHT '08 QA RESOLUTION, LACSD

President, Larry Lovell, opened the meeting with announcements of the upcoming meeting schedule and other items of interest to members.

The upcoming months are mainly devoted to Bight '08 QA resolution meetings between different laboratories followed by a synoptic data review meeting. There is an annual executive officers' meeting scheduled for August 28. The SCAMIT Christmas Holiday party will be held on December 4th or 11th at Cabrillo Marine Aquarium.

Larry announced the formation of a Species List Review Committee. The Committee is charged with updating the SCAMIT Species List on an annual basis. The Committee members are Don Cadien, Leslie Harris, Kelvin Barwick John Ljubenkov, Megan Lilly, Ron Velarde, Tony Phillips, and Larry Lovell. The advice of other members will be sought as necessary. The group will meet in person to organize their effort and then should be able to take care of their tasks via email thereafter.

Ananda Ranasinghe of SCCWRP was in attendance. He presented a report on the Bight '08 Benthic Committee and its next steps: There is an end of September QA deadline, which will be pushed back to allow for completion of the laboratory QA resolution meetings. Ananda will have the synoptic species list for distribution prior to the Oct 18 meeting date. He is concerned about the whole list being completely reviewed at one meeting. His providing the list ahead of time will help with that. We will likely form small groups each focused on resolving an individual major taxonomic group. Bight Benthic Committee meetings will commence again in preparation for the final report.

The Bight '08 QA resolution process to be used during the day was then reviewed and discussed by Cheryl Brantley. She commented on the inter-laboratory QA process to be used. Cheryl then reviewed the Discrepancy Resolution Reports that will be filled out by LACSD personnel. These reports will track each identification resolution event and categorize it. Results from the resolution reports will be the basis for any data change recommendations. The QA error rates will be calculated from the Discrepancy Resolution Reports.

Following Cheryl's review the taxonomists broke up into phyla driven small groups to review and resolve identification discrepancies. Prior to the meeting SCCWRP had produced a list of matching and non-matching identifications for each QA station. Each lab had received these files for review and had identified specific areas in need of resolution. With specimens available, the taxonomists paired up to reexamine specimens and resolve their differences in identification and/or specimen count.

Please visit the SCAMIT Website at: www.scamit.org

SCAMIT OFFICERS

If you need any other information concerning SCAMIT please feel free to contact any of the officers at their e-mail addresses:

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Single back issues are also available at cost.

The SCAMIT newsletter is published every two months and is distributed freely to members in good standing. Membership is $15 for an electronic copy of the newsletter, available via the web site at www.scamit.org, and $30 to receive a printed copy via USPS. Institutional membership, which includes a mailed printed copy, is $60. All correspondences can be sent to the Secretary at the email address above or to:

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