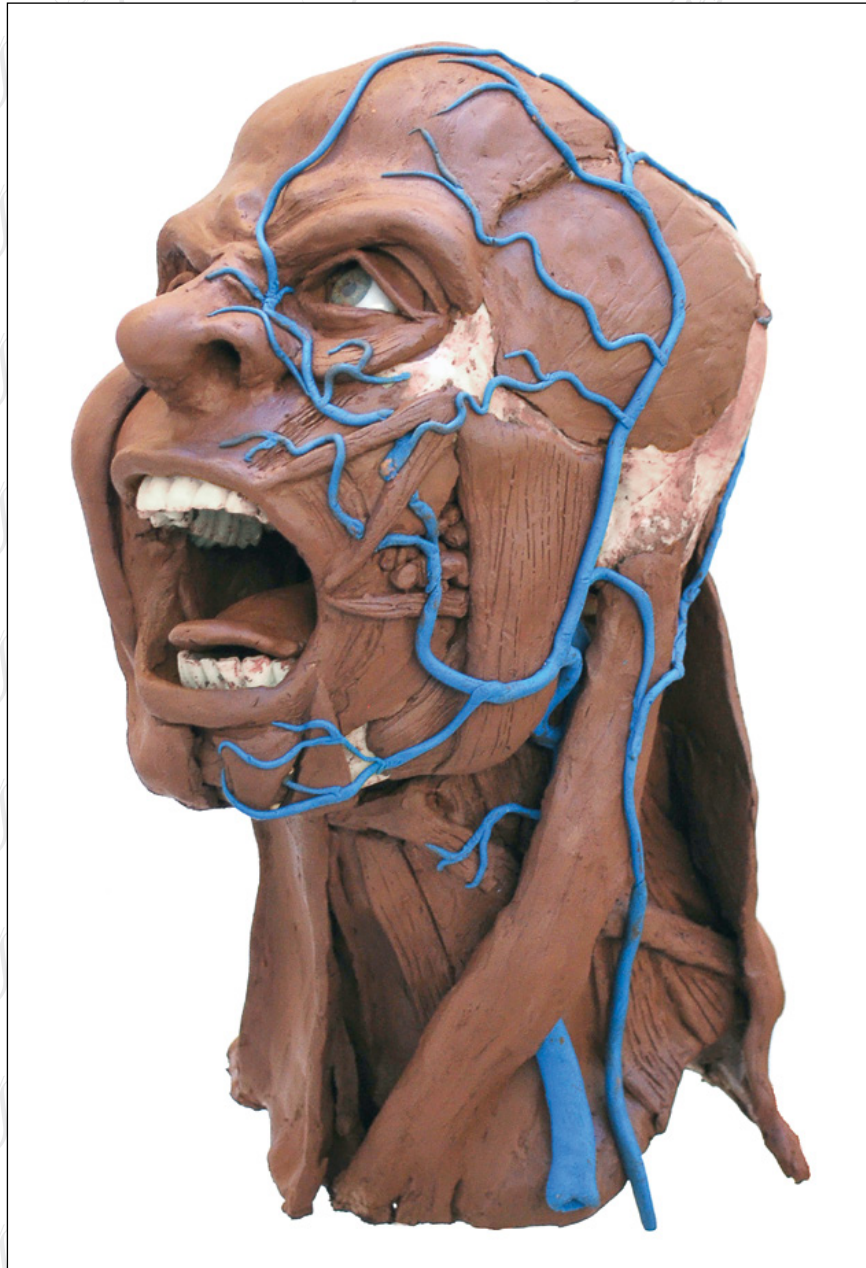


Journal of NATURAL SCIENCE ILLUSTRATION

GUILD OF NATURAL SCIENCE ILLUSTRATORS



A Note From...

Clara Richardson, GNSI Journal Co-Editor-In-Chief

With this issue we continue a trend we have begun to notice: that articles about all sorts of things come in from our members. This makes life really interesting for us and we appreciate it. I can honestly say that editing an article and then laying it out for press allows me to really absorb what the person is saying. I appreciate that about this job.

The articles we are happy to bring you show that our members have a truly wide range of skills. Sometimes we see a range of skills in one article, as Jessica Hsiung shows. Did you realize her cover image is an actual model created with real materials? I didn't when I first looked at it —perhaps because I assumed it would be a 3D computer model. Then Jessica also taught me a word I had never heard before: *haptic*; you'll have to look for it.

As always, we urge you to contribute. You'd be surprised at how rough some first drafts are — this we are prepared to deal with. Sometimes it takes quite a while to get an article in the pipeline ready for press. We know you are not all natural writers, but you are all naturally creative people. Bring us your ideas—if you need help with the writing, we can help or find help.

Regards,

Clara Richardson
clara@illustratingforscience.com

PLEASE NOTE OUR NEW MAILING ADDRESS:

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Washington, DC 20015

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Cover: Facial reconstruction using clay and plasticine on a skull model, showing facial muscles in angry expression, as well as facial nerves, © 2015 Jessica Hsiung



The Guild of Natural Science Illustrators is a non-profit organization devoted to providing information about and encouraging high standards of competence in the field of natural science illustration. The Guild offers membership to those employed or genuinely interested in natural scientific illustration.

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CONTACT AND PURCHASING INFORMATION:

BY MAIL OR PHONE:

Contact: Leslie Becker, Administrative Assistant:

Ph/Fax: (301) 309-1514, gnsihome@his.com

P.O. Box 42410

Washington, DC 20015

ONLINE:

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Science Illustration as Storytelling:

Explaining Complex Problems Through Interactive Science Illustration

— M. Genevieve Hitchings

The web creates a unique forum for storytelling that is well suited for explaining complex problems. Science illustration, when combined with interactivity, opens up unique possibilities for presenting clear, digestible bits of engaging information. As the interactive world becomes increasingly sophisticated, so do possibilities for presenting visual content in ways that offer alternative paths to traditional storytelling. We are seeing exciting developments in digital storytelling through online newspapers and magazines, as they experiment with interactive info-graphics and data visualization charts to communicate content.

What is digital storytelling? Simply put, digital storytelling (also referred to as online documentaries or interactive storytelling) entails designing a linear story within a non-linear environment. In traditional media such as books, magazines, or even movies, content is structured with a clear beginning, middle and end, and the audience is passive, only their attention is required. However, in the online world, the audience controls the path of their experience. The nature of the online world fosters participation and requires user input.

As an illustrator, understanding the challenges and benefits of digital storytelling potentially increases opportunity for work in a wider array of outlets. If, for example, a story can be depicted in a time-based environment that users control, then potential clients could be persuaded to use illustrators rather than relying on photography.

Because content is easily compartmentalized into smaller bits of information, a storyline can be broken down into pieces and re-connected in more than just one way. A central story might offer tangents that can significantly enrich a story or even alter the relationship an audience has with the content they are navigating. The challenge becomes connecting these disparate parts in ways that makes sense to the audience.

In 2012 the New York Times received attention and recognition for an interactive article they published, titled *Snow Fall* (www.nytimes.com/projects/2012/snow-fall). The online editorial was seen as a novel piece of interactive design. As you scroll down the page, various images, videos, maps, slideshows offer digressions that help to enhance the story and bring the user deeper into the content.



Digital storytelling is not merely the design of a multi-page website, but the presentation of content within a single web experience. Essentially, one is presenting a series of consecutive images that tell a story or explain a concept, ideally with striking imagery and minimal text.

With some exception, content can be presented in one of three ways: sequentially as one scrolls down the page, in the form of a slideshow, or a possible combination of the two. In the case of a slideshow (think forward and backward arrows, or perhaps clickable numbers or letters), you don't have to jam-pack information into one screen, you have an endless number of slides to present clear and articulate ideas.

With digital storytelling one has the added benefit of working in a time-based medium. This means animation, sound, text, photography, maps, and illustration can all be incorporated into explaining complex concepts. In 2015, The Washington Post in collaboration with Independent Lens, PBS TV's documentary series, launched a sophisticated online, interactive, documentary titled *After the Storm* (Fig. 1) to mark the 4th anniversary of the destructive tornado that tore through Tuscaloosa, Alabama. The piece is a tribute to victims of natural disasters, as told from the personal experience of Andrew Beck Grace who lived through and survived the

Figure 1: pages from *After the Storm*. Written, directed and photographed by Andrew Beck Grace, Interactive Design Helios Design Labs, Presented by ITVS/Independent Lens. Courtesy of Helios Design Labs.

www.washingtonpost.com/posttv/afterthestorm/index.html#/dear-future-disaster-survivor



Figure 2: *Creatures of Morningside Park*
© M. Genevieve Hitchings; all rights reserved/www.artorium.com

Created for: urban-parks.org



© M. Genevieve Hitchings ALL RIGHTS RESERVED. www.artorium.com ACKNOWLEDGEMENTS

EDITORS' NOTE:

PLEASE LOOK AT THE LIVE WEBSITES CITED HERE.

We love print. This is primarily a print magazine. However, in this case we suggest that, after reading the print article, you look at the web site version (linked through the www.gnsi.org store description page) for the other excellent examples that are cited but which we lacked permission to reproduce here.

The printed illustrations are a mere shadow of the actual websites themselves. The movement from one page to another, (or down the page in the Fracking example p.6) and the fact that you often must choose where to go next are integral to the telling of the story.

storm. The project is a wonderful example of the true potential of online storytelling; it follows a linear path but allows the user to navigate through the story at their own pace and in their own direction. Where photography and video fall short, the project effectively uses illustration and animation to convey the emotion of Grace's terrifying experience. The medium of interactive storytelling lends itself very nicely to sequential images, especially illustrations because the possibilities for depicting content are infinite.

The Internet is increasingly sophisticated in its capability and design. Content needs to be carefully structured within the viewing screen to enable users to make sense of what they are looking at. Online attention span tends to be short. If you stifle the ability to click, you are likely to loose your audience. And yet, stories have to follow a linear structure to be clear—you don't want someone jumping to the end without the understanding that they have not seen the middle.

Creatures of Morningside Park is a single page, interactive illustration featuring several animals

often seen near the pond at Morningside Park in New York City; it shows how they are linked in a complex and fragile urban ecosystem (Fig. 2). Working with scientists from the New York City Department of Parks and Recreation's Mid-Atlantic Regional Seed Bank, I designed the piece to cultivate a sense of citizen stewardship of New York City's natural resources. The animals in the illustration are clickable, causing an overlay to appear with more detailed information. The content lent itself well to interactive storytelling.

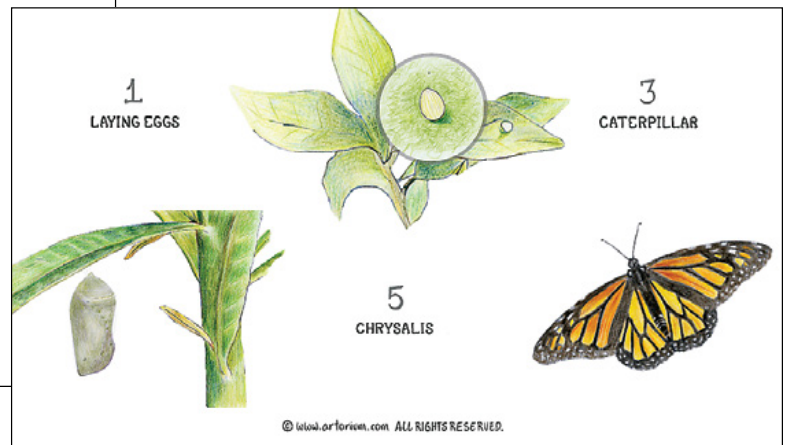
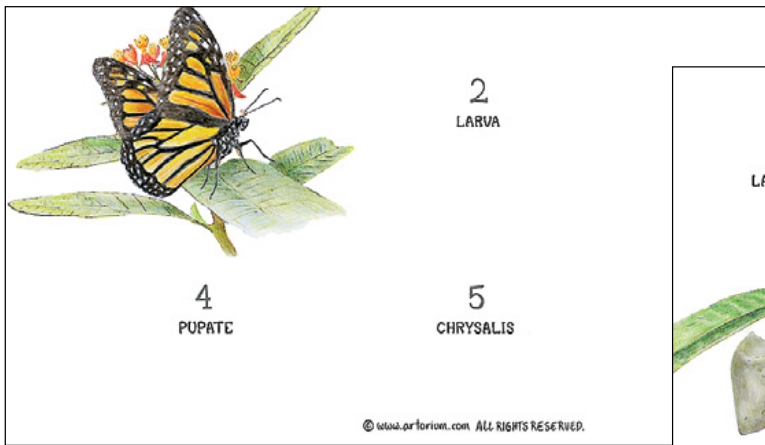
Digital storytelling can revolve around a central theme and not require a particular order for viewing subsequent details. *The Dangers of Drug Driving* (www.evanshalshaw.com/more/effects-of-drug-driving) is another good example of this type of interactive design. The site functions as a public service announcement and provides a guide to show exactly why (and how) drug driving is a risk. Content is focused and centered on images. Although there is a homepage, which serves as the 'beginning,' there is no clearly defined middle or end; through a series of strategically placed buttons the audience is prompted to explore the site via their own path and pace.

Similarly, *The Grey Tales* (Fig. 3) is a site designed by three friends who were inspired by an encounter with elephants during a trip to Vietnam and wanted to share their story, in an effort to bring awareness to these large, graceful creatures. The site is minimal in its content, featuring a scrolling navigation of the five countries where elephants reside. Each of the five sections consist of an illustration and supporting text, highlighting a few unique characteristics of elephants. Although content is presented in sequential order, users are free to browse the site in whatever order they choose. The last item on the navigation bar 'souvenirs' offers users an opportunity to create and send a digital postcard. The feature is

Figure 3: *The Grey Tales*,
Courtesy of Julie Flogeac, Louis Ansa and Florian Morel.

thegreytales.net/en





a clever and engaging way to help promote the site; within the same section if you scroll down the page there is additional information about how users can get involved and help support elephants.

Designers have to present content in ways that offer users choice and control. The fluid nature of the Internet is based on a fragmented structure; bits of content are presented in chunks. Good web design depends on clear guidance but allows users to click as they please. A clear and organized hierarchy of information is essential. Screen space is limited and dependent on the size of a monitor. Basic elements, such as navigation menus, branding, headers, and captions have to fit within the viewing screen. And while they should not be the focal point of the page they must be visible at all times. If content does not fit within the screen, a user will have to be willing to scroll down the page to find it. Allowing a user to understand where they are within their online experience is key to designing a clear and well-presented 'story.'

Metamorphosis (Fig. 4) is a site I built to experiment with presenting a sequential concept in the online world. Featuring a Monarch butterfly, this interactive project illustrates the life cycle of butterflies for young audiences who are in the process of learning to read. The website requires minimal instruction as it showcases the stages of metamorphosis. Content is presented in sequential order and yet users can click anywhere within the page to trigger one of six, short, animations showcasing the four stages of a butterfly's life: egg, larva (the caterpillar stage), pupa (the chrysalis phase in a

butterfly's development), and adult. Depending on where and when the user clicks, the animations play simultaneously or individually, and in a no specified order.

In today's world of digital gadgets, there is of course the added challenge of presenting content that can be viewed on multiple devices and screens. Referred to as 'responsive design,' the layout of a web page should ideally shrink down, or expand (also referred to as liquid or elastic layouts) to the size of the screen it is being viewed on. A good website will have a mobile version and a non-mobile version. In the case of digital storytelling balancing imagery with essential text and navigation can be difficult if viewing a page on the tiny screen of a mobile device.

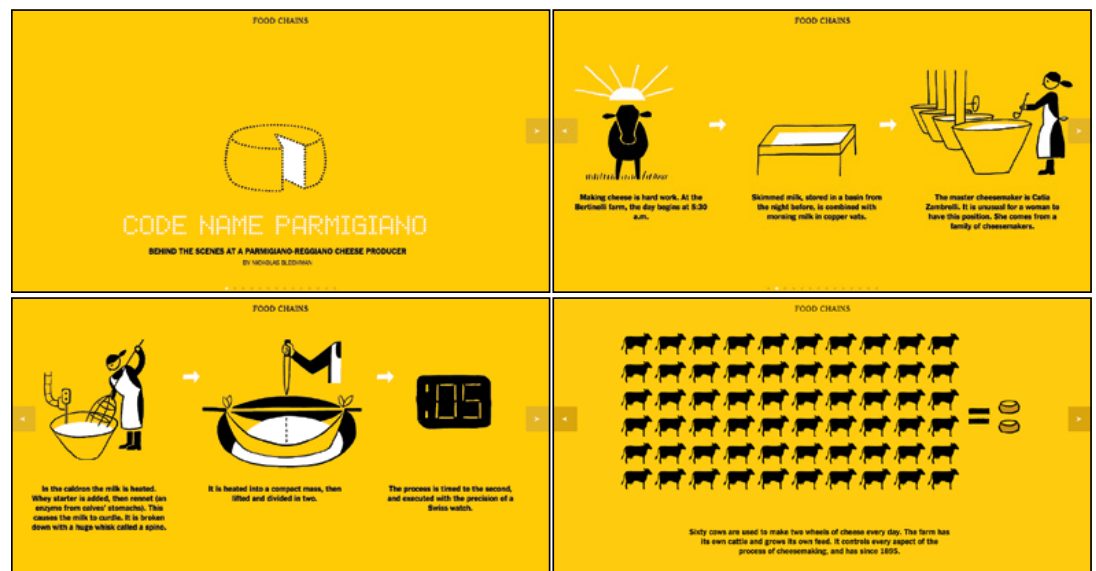
Nicholas Blechman illustrated and animated a series of editorial 'mini interactive documentaries' under the title *Food Chains* (*Planet Pasta*, *The Mystery of San Marzano*, *Extra Virgin Suicide*, and *Code Name Parmigiano* (Fig. 5). Investigating and exposing the complexities of our globalized food economy,

Figure 4: Metamorphosis © M. Genevieve Hitchings; all rights reserved/www.artorium.com

www.metamorphosis.urban-parks.org

Figure 5: Code Name Parmigiano © 2014 Nicholas Blechman

www.nytimes.com/interactive/2014/06/06/opinion/food-chains-code-name-parmigiano.html



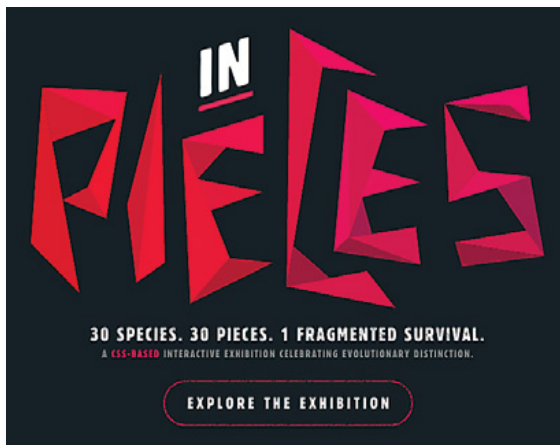


Figure 6: All images this page spread- *Species in Pieces*, Courtesy of Brian James

www.species-in-pieces.com

The animations in this website work in Safari and Chrome. Firefox is offered a different, less animated version.

Blechman very effectively uses a simple and engaging interface to tell his stories. The piece, along with all its content resizes nicely regardless of what device it is being viewed on. The full-screen, slideshow consists of his illustrations hugged by a forward and backward button, and supported below by a minimal, navigation bar indicating which slide the viewer is on and how many slides there are in the story. If a viewer jumps ahead they know where they are within the story. Simplicity in his design (not to mention his illustrations) makes for brilliant online storytelling.

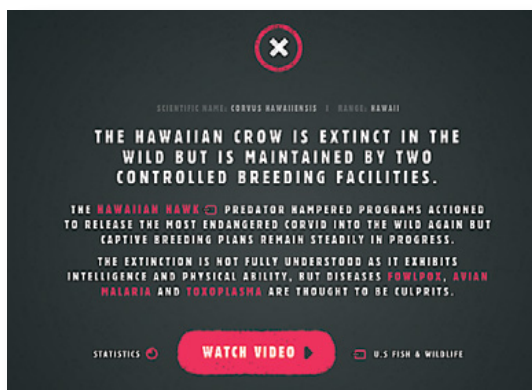
The challenge of keeping up with ever-evolving technology can seem intimidating. However we have entered an era of web development that favors Open Source. This means the code used to create a webpage is available for others to view and borrow, and search engines can easily comb the contents of a site to help promote and make

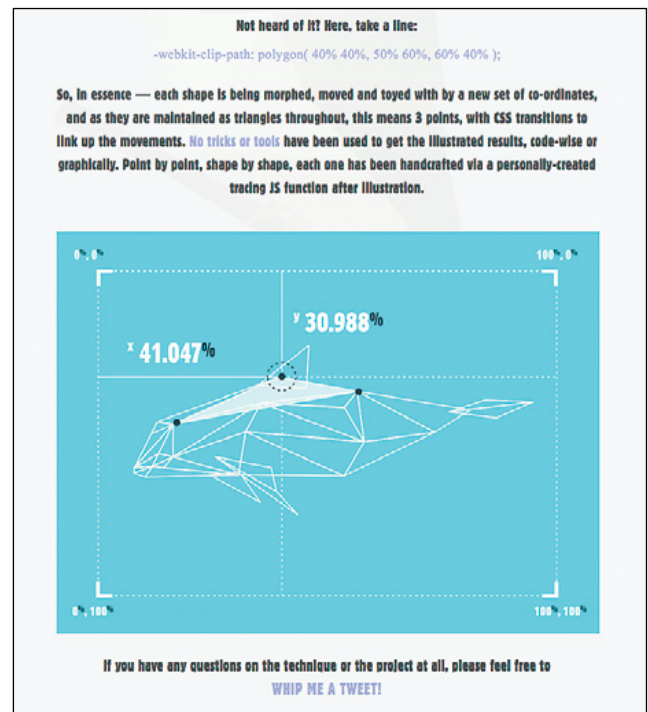
it searchable. Ideally, code is written in a format that adheres to web standards helping to ensure accessibility, stability, quality control, and ease-of-use for all users.

At the beginning of 2015, interactive art director, designer and coder, Bryan James, created an experimental, site *Species in Pieces* (Fig. 6) to showcase 30 unique animals worldwide that are on the verge of extinction. The site functions as an informative interactive exhibit. Users can scroll through the different animals with their mouse or their arrow keys, or via a simple fixed navigation on the right hand side of the screen. There is also a special icon (button) providing more detailed information on each species. Here James calls attention to the role humans have played in making life uninhabitable for many of these creatures.

Using a line of CSS code that enables the construction of polygons (webkit-clip-path), James' entire project highlights this feature. Each of the 30 creatures is constructed using 30 polygons that seamlessly morph into one another. All aspects of the project reinforce the serious threat facing each of these species through 'pieces.' The beautiful, fractured, animating pieces allude to both the complexities of our diverse, natural world, having evolved over thousands of years, as well as the tragic state of its current existence.

In 2011 web designers began incorporating parallax scrolling; this is now an effect we see frequently. Parallax scrolling enables background images to move slower than foreground images as one scrolls down a webpage, creating the illusion of depth and movement. When thoughtfully executed, the integration of movement and interactivity into a webpage can enhance and facilitate more meaningful online experiences.





The Dangers of Fracking (www.dangersoffracking.com) shows a creative and engaging use of parallax scrolling. Designed and illustrated by Linda Dong, the entire contents of the site are presented within one page. There is no need to click, as the user scrolls down the page the story unfolds through illustration and minimal text. For details, strategically placed rollover buttons present additional facts that pop-up as an overlay within the page.

Perhaps more so today than at any other time, there are excellent opportunities for illustrators to tell compelling stories online. While technology continues to evolve, the basic concepts of storytelling remain constant. The concept of a narrative implies there is a path to follow with a clear starting and end point. But with the fluid nature of the web there is opportunity for presenting content in ways that deviate from that norm. If well presented, the ability to offer tangents can dramatically enrich a central story.

Illustration in particular lends itself nicely to explaining complex problems in an interactive environment, because there are no limitations for describing content visually. Illustrators can depict content on subjects that photographers, for instance, might not have access to.

Science illustration is uniquely poised to embrace the possibilities of presenting complex information interactively. It has always been our job to visually reconstruct scientific discoveries in ways that help to clarify details that might otherwise be too difficult to comprehend. Ours is a process of explanation; having the ability to explain complex processes through a series of steps opens up exciting new possibilities for visual solutions.



ABOUT THE AUTHOR:

M. Genevieve Hitchings is an Assistant Professor in the Communication Design department at New York City College of Technology. As principal designer of Artorium (www.artorium.com), a design studio in New York City, Genevieve has experience in brand development and interactive creative planning. She has been responsible for project management, art direction, design and illustration in a wide range of multi-media projects. Genevieve is also co-founder and chair of Design Incubation, a think tank for educators and practitioners of Communication Design to discuss their design research and practice.

An Evolving Career in Scientific Illustration: Part II

—Jessica Hsiung



You may remember my first installment: after attending the GNSI Summer Workshop at Pierce Cedar Creek Institute in Hastings, MI, I realized Science Illustration was the career for me. I finished my undergraduate studies at the University of Toronto, and enrolled in the Science illustration program at Monterey Bay. On to Part II!

After my time in the Science Illustration program in Monterey Bay, California, I completed two internships—one in the Herpetology Department at the Royal Ontario Museum in Toronto, Canada, and the other in the Entomology Lab at the Smithsonian Museum of Natural History in Washington, D.C. At the same time, I worked on a project illustrating an article on cardiovascular health associated with *Scientific American*, and continued to accept commissions and develop my portfolio. That summer, I decided to try to pursue illustrating science in the even more specialized field of medical art. I ended up applying to the MSc in Medical Art program at the University of Dundee, Scotland, after researching a number of schools around the world. With a renowned Centre for Anatomy and Human Identification, the University of Dundee boasted a Queen's Anniversary prize for Higher Education—

what better opportunity to study and travel to the U.K.? Before I knew it, I was accepted and I was flying across The Pond to my new home for a year.

Arriving in Dundee, I could see how different it was from the North American landscape I was accustomed to. Older, narrower cobblestone streets, set against a backdrop of the River Tay, Dundee is historically rich and charming. Bonus points also for being Scotland's sunniest city! Though nothing like the gargantuan university blended into the city where I did my undergrad, Dundee's university campus exuded a warm feeling of community. It was active, social and had a large study-friendly library; I was looking forward to my year in this atmosphere.

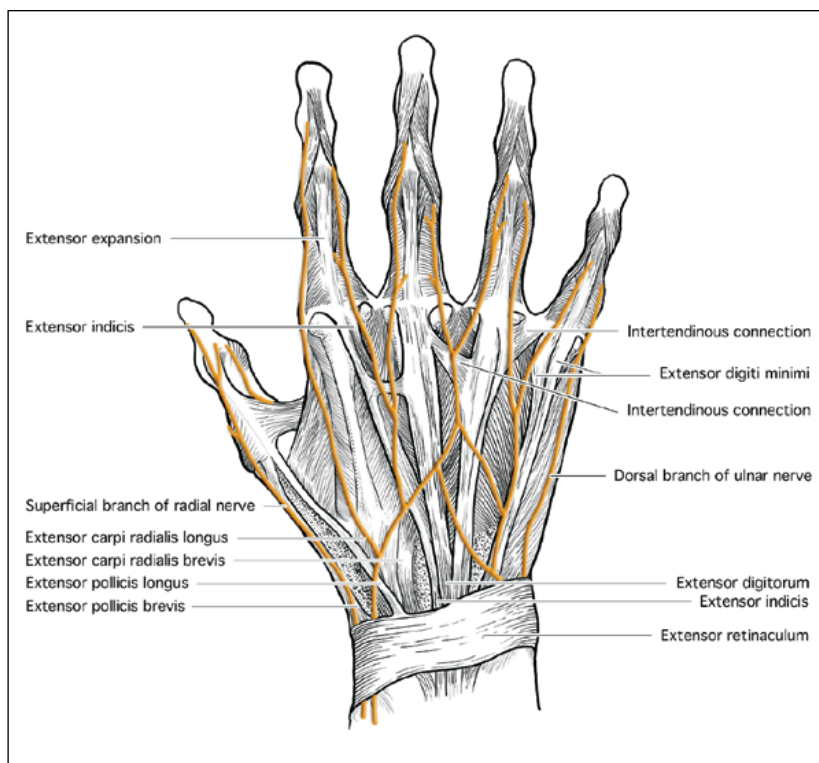
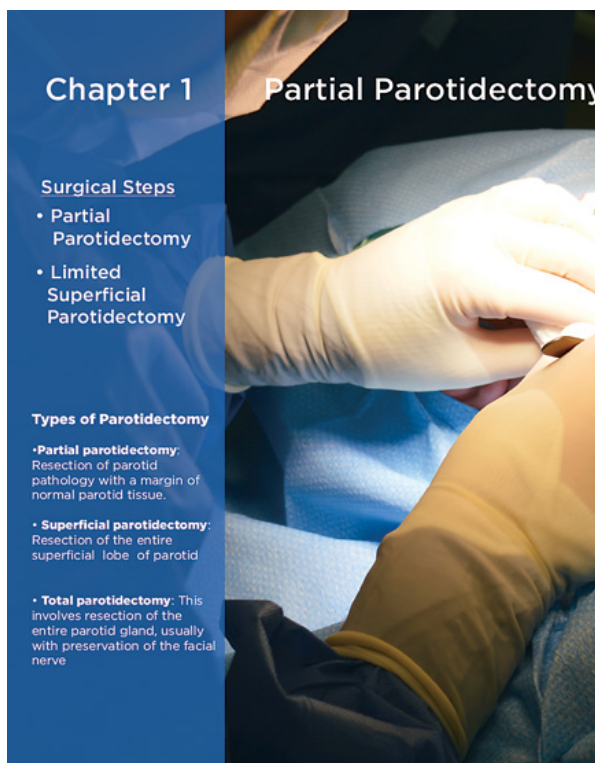
The Medical Art program was 12 months long, with overlapping classes with the MSc Forensic Art and MSc Forensic Facial Identification studies. This year there were a total of 13 students, with 6 in the Medical Art program, led by coordinators and instructors Caroline Erolin for the Medicals, and Dr. Christopher Rynn for the Forensics.

The first semester was comprised of learning head and neck anatomy. The class was assigned a human cadaver to study and on which to perform dissections. The cadavers at the University of Dundee are embalmed using Thiel, a soft-fix method of embalming that preserves the natural colour and feel of the body. This was especially useful for drawing accurately.

There were also life-drawing classes focusing on écorché techniques (a painting or sculpture of a human figure with the skin removed to display the musculature), with critiques in the studio for helpful feedback on our drawing skills and accurate placement and rendering of the bones and muscles.

The second semester had us moving onto postcranial anatomy and histology, producing illustrations reflecting our learning. There was also a medical legal ethics unit, with a rather nerve-racking mock trial evaluation. During this time, we started making visits to the nearby Ninewells Medical School and Teaching Hospital to watch surgeries in the Ear Nose Throat (ENT) Department. From those visits, we were expected to make sketches in the operating room and then produce a final surgical sequence on the procedure of our choice. Visiting the hospital was personally my favourite part of the program, as we were able to change into scrubs, interact with patients





and watch how the surgeons work their magic. The medical staff was exceedingly kind and patient, letting us take reference photos and pausing at times to point out structures or explain what they were doing. I was also able to get in touch with surgeons in other departments and watch a few surgeries there.

Digital techniques were a significant part of the curriculum. Assignments were given to create illustrations of a scapula and surgical instrument using digital painting in Adobe® Photoshop® and Illustrator® respectively, while also creating other works to focus on how to communicate information to general audiences vs. specialists. We were also given tutorials in the 3D modeling programs ZBrush®, Maya® and Freeform®, with Freeform being something especially novel to me, as it used a haptic device* to sculpt the virtual clay on the screen, allowing me to feel the pressure and movements of the sculpting tools in the materials. Learning how to generate CT (computerized tomography) reconstructions (generating 3D models from 2D scans and x-ray images of the body) and the basics of studio photography were also part of our training.

The final component of the program was working independently on a thesis project in the third semester. I chose to create an interactive iBook with 3D animation aimed at helping patients understand the Whipple Operation, a major procedure involving the removal of pancreatic tumours. This operation has a high morbidity rate and my aim was to replace existing text-only patient resources with a more

engaging and visually informative, all-in-one package that would hopefully improve the patient experience and lower healthcare costs. It was also my goal to learn how to model and animate in 3D using the ZBrush, Maya and Adobe After Effects® programs, while creating something that would also have a positive real-life impact.

I proposed my idea to the general Hepatobiliary surgeon at Ninewells Hospital, Dr. Christoph Kulli, and he was excited about adopting this new format for his patients. There were many meetings and talks between us about how to organize the content, and he also arranged for me to attend a Whipple operation in the hospital to take reference photos and get a better idea of the procedure.

We were given 3 months to complete the project, which culminated in a Masters Exhibition. Other classmates chose a variety of topics and ways to present them, including sculpture, illustrated books, 3D animation and interactive web catalogues. I am immensely thankful to have had the guidance of animation guru Sean Yu, who was unendingly patient with me and answered all my animation questions. To make a full-blown iBook and animation without ever having learned how to make either before (while meeting deadlines!) is challenging indeed, and the support I received from the university and hospital staff to help me achieve this was incredibly encouraging. At the moment, my iBook is pending approval with the National Health System for future use in the hospital.

Facing page, top: human right femur, graphite on paper, © 2015 Jessica Hsiung

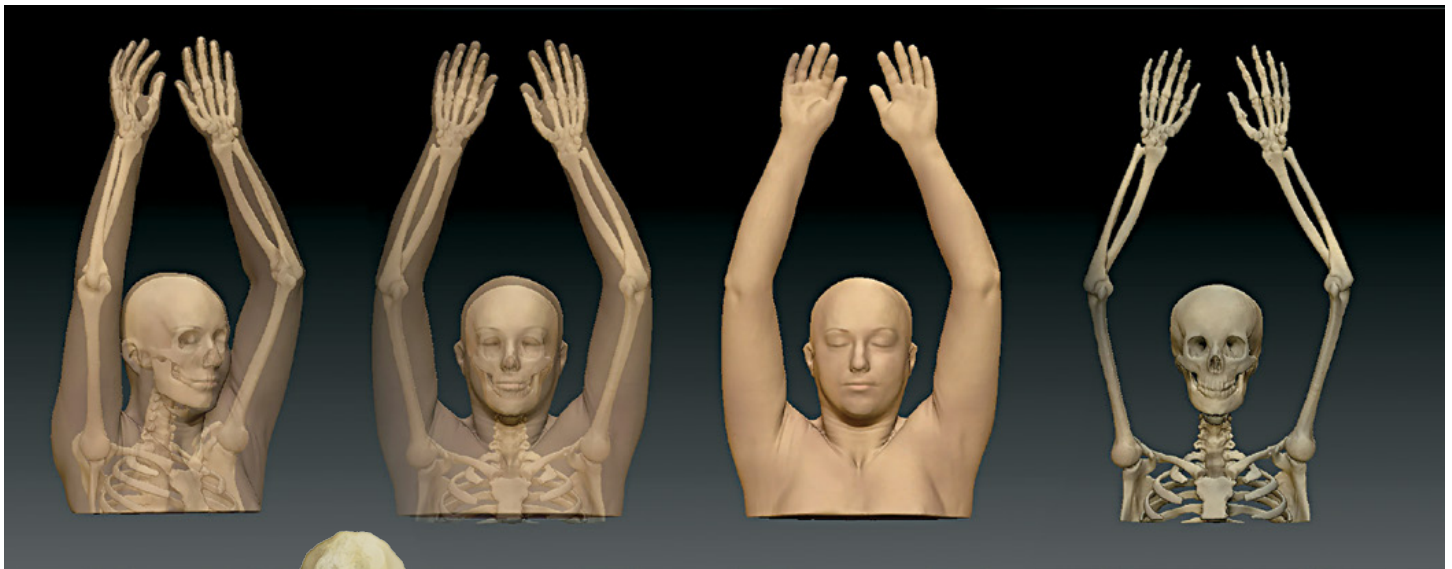
Facing page, bottom: Jessica and family attending her Masters graduation at University of Dundee in November 2015

Top left: Title page for chapter on the surgical procedure Partial Parotidectomy, with text and illustrations intended for specialists. (Photo taken at Ninewells Hospital, Dundee). Image courtesy of Ninewells Teaching Hospital & Medical School, Dundee)

Top right: Nerves and tendons of the hand, done in Adobe Photoshop®, © 2015 Jessica Hsiung

EDITORS' NOTE:

***haptic** denotes a computer technology that allows one to feel tactile feedback while sculpting in the computer. It does this by measuring the force applied by the user on the pen-like sculpting tool. (Yes, we had to look this up.)



Of course during the time that I could afford a break from studying, I tried to see as much of Scotland as I could. Most of the time I explored Dundee or took short day trips to the surrounding towns and cities, such as St. Andrew's, Broughty Ferry and Arbroath, and slightly longer ones to Edinburgh and Aberdeen. I also jumped at the chance to go on a university-planned bus tour to Loch Ness and the Highlands, and accomplished my dream of meeting a hairy cow.

Overall, my year in Dundee was a whirlwind experience and I learned more than I ever thought I was capable of. It was full of challenges and new experiences, and I met people from all over the world who shared my love of art and science. I am back home in Toronto now, continuing to build my skills in 3D animation, and excited for what my next adventure will be.

L

Top: CT reconstruction stills of a female torso, generated from data sets (www.osirix-viewer.com/datasets) using InVesalius®, ZBrush® and Freeform®

Middle: Right posterior scapula, done in Adobe Photoshop®

Chiropody pliers done in Adobe Illustrator®

Bottom: Broughty Castle on the banks of the river Tay, Broughty Ferry, Dundee

All images © 2015 Jessica Hsiung

Jessica's Scientific and Medical Art portfolio is available on her website: www.jessicahsiung.com

The 3D animation within her iBook can be seen here: vimeo.com/132972251



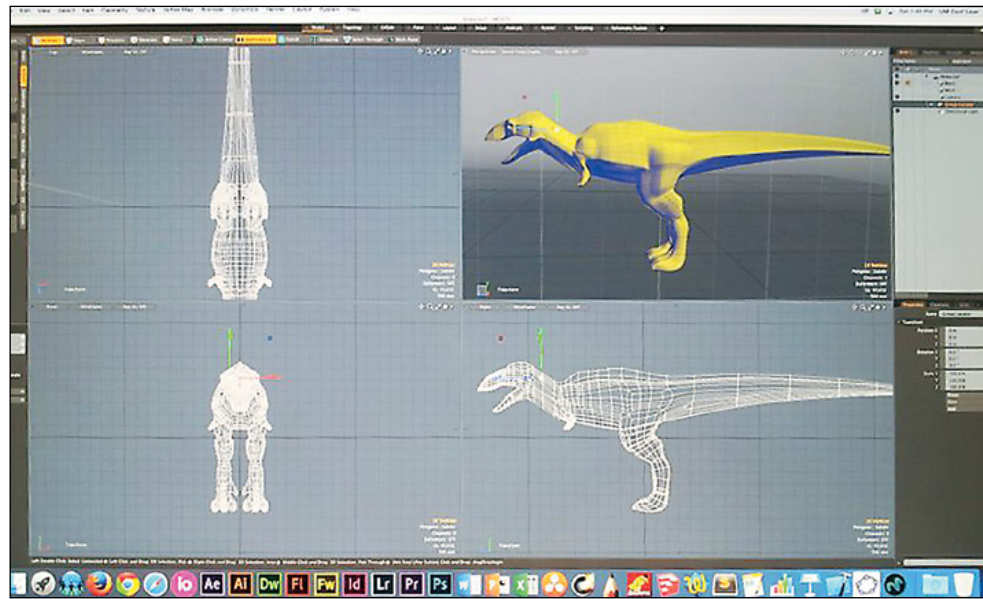
Visualizing Dinosaurs: An Introduction To Science Illustration in 3D

A GNSI Education Series Workshop Review

— Matteo Gabaglio

I arrived at Reagan National Airport on a beautiful day in October. Holding my boarding pass in one hand and my passport in the other, I proceeded to my final destination: Orono, Maine, for Chuck Carter's GNSI Education Series Workshop, "Visualizing Dinosaurs: Introduction to Science Illustration in 3D". Studio Kayama suggested that this workshop could be a good opportunity to learn new illustration skills. What instantly got my attention when I had studied the program description was the possibility to learn 3D modeling on a new platform (MODO®), to learn the basics of 3D object animation using Adobe® After Effects® and, most of all, to get a glimpse of Unreal Engine® (which allows illustrators to create storytelling content by putting their viewers into the illustration to discover and explore the virtual scene at their own pace). Since I know a little of 3D sculpting using ZBrush® program, I realized this was a fantastic opportunity to bring my sculpting to life. I also believe that 3D animation and virtual reality programs are becoming more and more accessible and affordable to scientific illustrators, a huge step forward in aiding science communication. Let's imagine, for example, that your paleontology drawings or your entomological specimens could come alive in a scientifically accurate 3D space that you built yourself. Or imagine you are creating a museum exhibit and can design it so that a little kid can put on 3D glasses and explore the Cretaceous environment, facing a life-size moving (and terrifying!) T-rex!

With these thoughts in mind, I was really excited when I landed in Bangor, began the workshop, and started to sculpt my own T. rex in the Innovative Media Research and Commercialization Center at the University of Maine, under the guidance of Chuck Carter. Four days later I was animating my dinosaur using Adobe After Effects. During these four days I can say that I had a good introduction to what a 3D space looks like, what are the basics of 3D sculpting and animation, and how to keep things organized while working. More importantly, I ended up with a lot of "food for thought", meaning that I came back with the awareness of the power of



these tools in scientific illustration. Moreover, I now understand the basic steps you need to go through in order to create a 3D illustration and a 3D animation.

I found the workshop inspiring even if I can't say that I have mastered 3D sculpting and animation. These are complex programs that require time and self-dedication in order to get them to work properly. Nonetheless, Chuck was a friendly and inspiring teacher. The constructive and creative interaction with other illustrators was definitely a good experience.

Being in Maine for four days gave me the opportunity to see this beautiful state, to make some good friends, and to share thoughts and ideas with them. Sara Taliaferro and Andrew McAfee were perfect organizers, transporting people from and to the airport, renting cars and even cooking for everyone! Everyone was extremely welcoming; we had dinner altogether almost every night and Chuck's girlfriend cooked the famous Maine lobsters for us once!



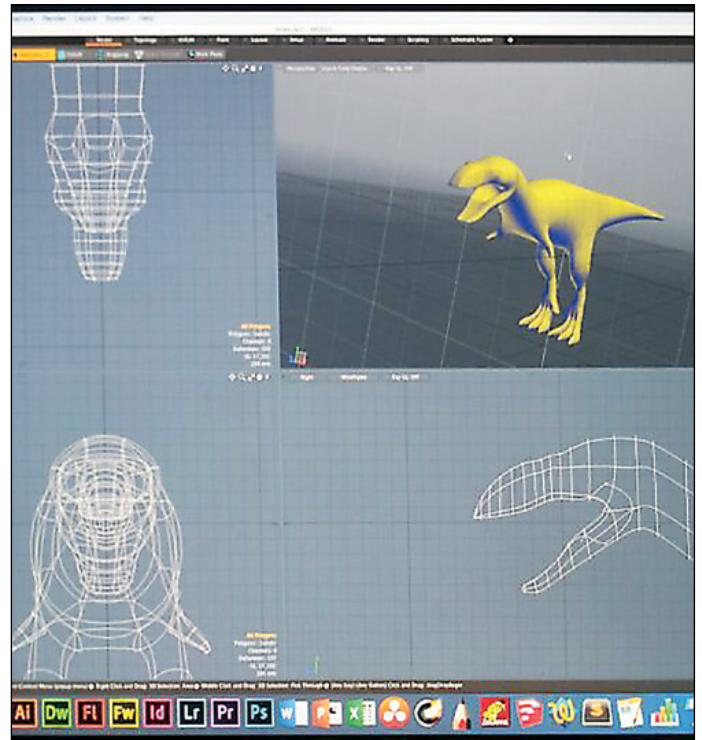
Top: Project completed during the workshop: 3D modeling of a T. rex.

Bottom: Class in session- GNSI Education Series Workshop, Orono, ME



Clockwise from top left:
Classroom during the workshop
3D modeling work completed
in class

Maine lobsters for dinner!



All images this and previous
page courtesy of Matteo
Gabaglio

I did enjoy my time in Maine, and I feel that I can recommend this workshop if it is offered again. One suggestion that I can make is to schedule goals every day, so that people don't get lost along the way and time is not wasted. I sometimes got the feeling that we didn't cover all the aspects in the program (especially Unreal Engine), mainly because we spent too much time modeling the subject and not enough on focusing on how to learn a workflow instead. Criticism aside, I'm glad GNSI provided this opportunity; following scheduled goals will help make this a really great workshop in the future.

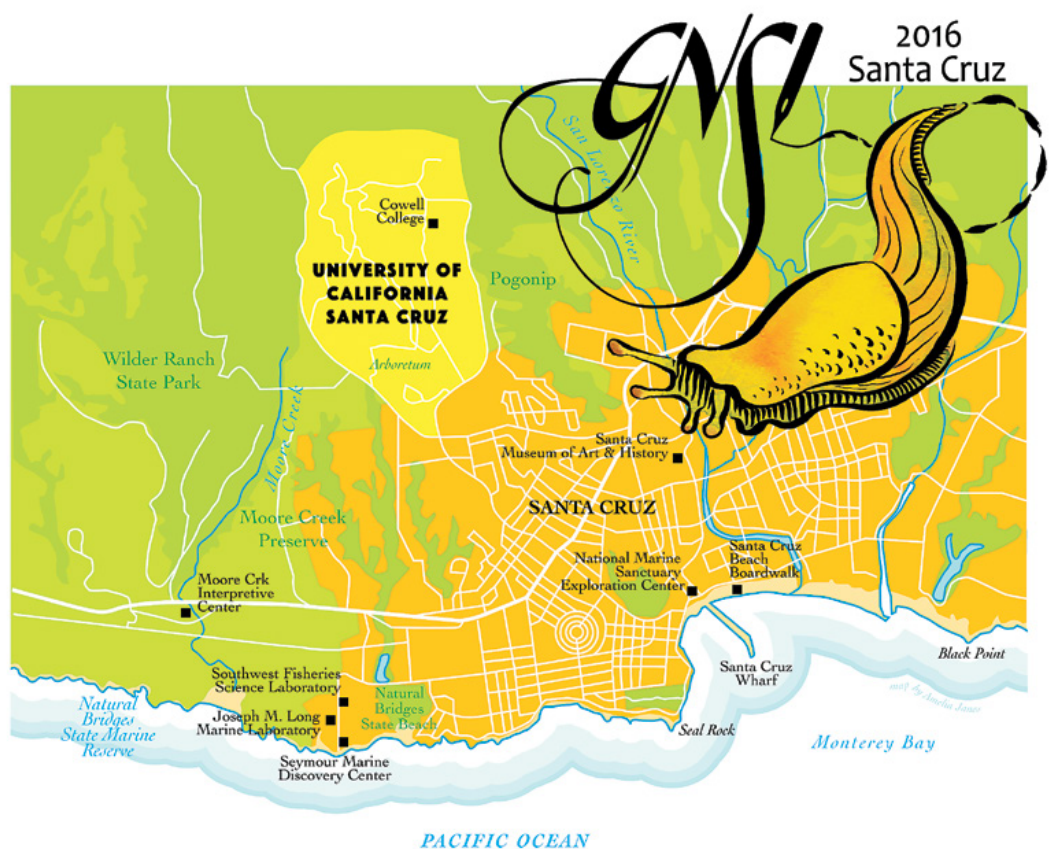
ABOUT THE AUTHOR:

I have studied conservation biology, obtaining a Master's Degree in Environmental Biology in 2014, gaining knowledge of wildlife monitoring and management and biodiversity conservation. During the last two years I have tried to combine my two lifetime passions, biology and illustration. I had the opportunity to work for the European LIFE project LIFE+ BIOAQUAE (Biodiversity Improvement of Aquatic Alpine Ecosystems) as a scientific illustrator. This brought me to apply for a grant in Italy and I won the opportunity to spend 3 months in the US as an intern at Studio Kayama in Washington DC. I am now, thanks to this great career opportunity, starting my own business back in Italy.



Welcome to Santa Cruz

GNSI 2016
Annual Conference
July 3–9



This summer's conference will be hosted at the University of California, Santa Cruz campus, and is shaping up to be unlike any other. We have not just two, but **seven plenary speakers**, and we are planning an exciting large-scale group art event.

Time constraints have precluded the option of a physical space for the annual exhibit. This year, we are featuring the **juried works in an online gallery on the GNSI website**. Many other art conferences now feature online exhibit galleries, which help to cut back on costs, materials, and labor, and make the artwork more accessible to a larger audience for a longer period of time. In fact, this year's exhibit will remain online for six weeks, giving the artists more publicity and recognition. It will then be archived but still accessible on the GNSI website.

Toward the beginning of the conference, we will be hosting a **collaborative, large-scale art event**—much like a street chalk art happening—but on rollable paper or canvas. The conference committee is establishing a unifying local theme, such as a quilt-like rendition of a kelp forest ecosystem, an ocean food web, or a tree of life. We will announce the theme in advance so attendees may bring sketches/reference materials. All members are welcome to participate!!

The Conference website is now live!

2016.conf.gnsi.org

Registration will begin mid-April! Stop by and read about all the wonderful events, field trips, speakers, workshops and presentations in store for you in beautiful Santa Cruz. You can also find information about housing, transportation, and fun things to do on campus, in Santa Cruz, and in the region.

SPECIAL PULL-OUT SECTION: 2016 ANNUAL MEETING INFORMATION

speakers & presen

In our last edition of the journal, we highlighted five of our plenary speakers, including Dr. David Goodsell, Jane Kim, John Muir Laws, Wendy Hiller Gee, and Terryl Whitlatch.

We are also looking forward to talks from these experts:



Breck Tyler

Albatrosses: Ecology and Conservation of Pacific Ocean Wanderers

Albatrosses are premier mariners, spending years at sea and traveling thousands of miles across ocean basins. They are supremely adapted for efficient, long distance flight but they also have complex behaviors on land. Returning only to nest, adult birds reunite with lifelong (50+ years) mates while youngsters engage in elaborate courtship dancing. Midway Atoll, a tiny island in the remote Northwestern Hawaiian Islands, is one of the world's largest albatross colonies, hosting more than a million birds. Sharing experiences from 25 years at Midway, Breck will talk about the ecology and conservation of these magnificent creatures.

Image credit: © 2015 Martha Brown

Marc Paisin

Copyrights and Wrongs: How to Stay Out of Trouble and Keep Others From Infringing on You

Marc will give a light-hearted, informative, visual presentation about copyright basics pertaining to illustrations, including side-by-side images of originals and infringing "knock-offs". You'll leave making sure that you know just what to do to stay out of trouble when using copyrighted source work AND how to register your copyright and how to license to others and keep others from infringing you! Sample copyright licensing contracts will also be provided, and there will be plenty of time for your questions.



auCTION!

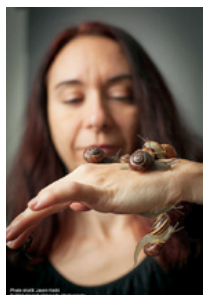
Start gathering those auction goodies! All auction proceeds are split evenly between the GNSI General Fund and the Education Fund, so your support is greatly appreciated! Plus, you get to clean out those closets! We take most anything, from the lovely to the whacky, and even that Indescribable Thing [you know, that strange gift you got this Christmas from Uncle Fred and Aunt Flo, here's your chance to unload it!]. We'd love for you to bring it with you, but if you can't make it (or it's too big to haul), shipping info will be coming soon.



SPECIAL PULL-OUT SECTION: 2016 ANNUAL MEETING INFORMATION

tations... more to come!

In addition to the plenary speakers, we have over 45 presenters giving 50-minute talks on a variety of topics, ranging from traditional media to digital techniques to various topics of scientific interest. Here are a few sneak peeks:



Marla Coppolino

The Non-Charismatic Microfauna: How We as Illustrators Can Illuminate Appreciation for Snails and Other “Unlovely” Living Things
With land snails as the featured model, this presentation will provide ideas for how we as illustrators can help improve ecological literacy and cultivate appreciation and conservation interest of the lowly critters.

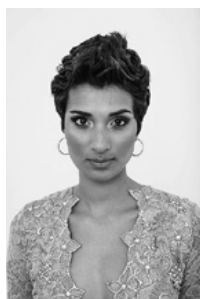
You'll also gain insight into some of the basic how-tos of illustrating live and preserved invertebrate specimens.

Asher Jay

Art to Action: Influencing Behavior Through Creativity

Jay's exploration of humanity's terrestrial lineage—and the impact that human disengagement with its own evolutionary and biological development is having upon all life on earth—made her realize there is a great need for resensitization and rewilding.

Jay draws unique relationships between seemingly disparate realities and entities, ultimately evoking the moment of epiphany and authentic emotion she experienced when the cause or connection first became apparent to her.



Nicolle R. Fuller

A Nanotechnology Illustration Niche Beyond Sci-Fi: The Art and Science

Come learn a little bit about nanotechnology science beyond the sci-fi, along with a little bit about Nicole's illustration techniques using Cinema 4D to create the nanospheres and then composite and paint them in Photoshop.



Ikumi Kayama

Removing Backgrounds in Photoshop: A Comprehensive Review
“How do you get rid of the background?” may be the most frequently asked question from illustrators and artists working in Photoshop. There are many ways to achieve the same results; come see the options that you might have not considered before.

Terri Nelson

Field Sketching While Freezing: An Artist in the Antarctic

Terri Nelson was one of the National Science Foundation's artists in the Antarctic from 2015–2016. Join her while she talks about vodka colors, projectile penguin poo, and the wily snowy sheathbill, the bird with the worst breath in the Antarctic.

Laurie O'Keefe

My Journey Specializing in Veterinary Medical Illustration

This presentation will cover Laurie's passionate love for animals (inside and out), and offer a visual tour of past projects, her work approach, and art techniques.



Mary Parrish

History of Scientific Illustration/Art History

Mary Parrish has searched for, centralized, digitized, preserved, and researched historical illustrations hidden in dusty drawers and other nooks and crannies of her department at the Smithsonian. Mary will share her efforts to develop the historical paleo art collection in the Department of Paleobiology at the National Museum of Natural History.

Rick Simonson

Using the iPad® in a Science Illustration Workflow

The invention of mobile tablet technology, most notably Apple's iPad®, has encouraged creative professionals to “think different” about how they work. Learn how the iPad® can fulfill an important role in your workflow.



NOTE: A complete list of speakers, presentations, workshops and biographies is available on the conference website: 2016.conf.gnsi.org

SPECIAL PULL-OUT SECTION: 2016 ANNUAL MEETING INFORMATION

workshops...

Learn something new or brush up your skills in our unique 2-hr mini, half-day, and full-day workshops.



Linda M. Feltner

Watercolor Pencil: From Sketching to Sophistication (8-hr workshop)

Watercolor pencil can be refined and elegant as well as spontaneous and sketchy, portable, flexible and dynamic, and always fun. Create digital works while keeping your unique style fresh and exciting.

Soap tree yucca pods. © 2009 Linda M. Feltner.

Julie Himes

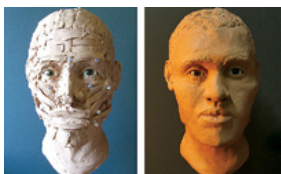
Fungus Fun: Mushroom Illustration (2-hr mini workshop)

This workshop is an introduction to mushroom biology and watercolor illustration. Julie will give an overview of fungi local to the Santa Cruz campus and some of the key characteristics to look for when identifying mushrooms.

Suzanne Wegener

Painting Lichens with Gouache (4-hr workshop)

Learn to capture lichen in gouache, the perfect medium! We will learn about lichen, then work hands-on to capture lichens with gouache on light and dark backgrounds.



Gloria Louise Nusse

Craniofacial Anatomy and Emotion of the Face (8-hr workshop)

Explore the muscles of the face as conveyers of emotion, focusing on human anatomy, using a series

of exercises to learn how to use this knowledge to illustrate believable emotion. Facial reconstruction. *Photos by Gloria Nusse.*

Reid Psaltis

Maquette Building (8-hr workshop)

Create your own reference for your illustrations by building a scale model of your subject. Starting with skeletal anatomy diagrams, Reid will show you how to build metal armature, pose it according to your needs, and flesh it out with plastaline clay.



Terry Anne Whitlatch

Believable Creature Creation (4-hr workshop)

This workshop concentrates on the creation of imaginary but scientifically plausible species, as required by today's animations, gaming, interactive graphic novels, and films, virtual and augmented realities, and science-based/speculative/paleontological documentaries.



Jennifer E. Fairman

Advanced Techniques in Adobe Photoshop (4-hr workshop)

In this workshop, participants will practice a workflow that uses advanced techniques while maintaining a traditional look and feel in their rendering.

Advanced techniques in Adobe Photoshop.

© 2016 Jennifer E. Fairman, CMI, FAMI.

Brooke A. Weiland

Basic Techniques in Adobe After Effects: Learn to Animate (4-hr workshop)

In this workshop we will explore the basics of Adobe After Effects, an easy-to-learn animation program. With these basic skills you will be able to add exciting motion to your Illustrator or Photoshop creations, or even your traditional illustrations.

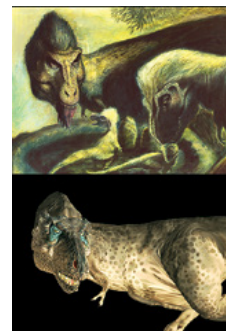
Leonardo Alannis

3D-2D Pipeline: Digital Modeling Techniques for Illustration (8-hr workshop)

This course will introduce participants to several techniques for incorporating 3D models into their illustration work in both digital and traditional platforms.

Completed painting above; 3D base model below.

© 2015 Leonardo Alannis.



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2016.conf.gnsi.org

SPECIAL PULL-OUT SECTION: 2016 ANNUAL MEETING INFORMATION

Interpreting Five Fingers, an interview with Sharon Birzer

— Audrey Freudenberg



An interview by Audrey Freudenberg with artist Sharon Birzer.

AF: Sharon, Five Fingers Lighthouse in Frederick Sound, S.E. Alaska, is by definition, off the beaten track. How did you find yourself there?

SB: The path to Five Fingers—well, I suppose it was a combination of obsession with the impossible and improbable selection: I was trying to learn about whales and ended up being captured by them in a way I hadn't anticipated. The lighthouse is built on one of five islands in Frederick Sound that were named because they kept catching boats. People thought the islands were the tips of fingers reaching out to grab sailors. So, what brought me and what caught me: in my "fine" artwork, I had been trying to capture the essence of internal systems in two-dimensional images, in a series called *Body Interiors* (Fig. 1). I printed the ground and silhouettes of human or animal bodies; on that ground I layered very detailed watercolor paintings/illustrations of found objects and symbols—things I found significant to those bodies in a metaphorical sense. I was working with a combination of literal and

metaphorical internal organs; at the time I described it for an exhibition:

"My work investigates and invents systems; internal, external, fictional and actual. Objects culled from my daily life appear in sequences that collectively inquire into the dynamic paths of labor, fruit and waste that bodies have to offer. The body is the site of our stories. In *Body Interiors* I take the body as a space for creating narratives, inviting multiple interpretations."

I was trying to explore the body as a place, a body as a location. Then in one of those brilliant moments when two branches of my multi-disciplinary career intersected, I participated in the GNSI 2012 Education Series Workshop: "Drawing on a Sense of Place" in Pablo, Montana, within the Flathead Indian Reservation. That time with Linda Feltner provided an immersion into the people and environment of the Flathead Reservation. We studied how to interpret the land, people, geography, flora, and fauna of an area. The description of the workshop read "We will discover the breadth of human history and native landscape and explore the means to capture its essence in interpretive illustrations."

AF: So the workshop, in effect, helped expand your work on "body" and internal systems to include an external place.

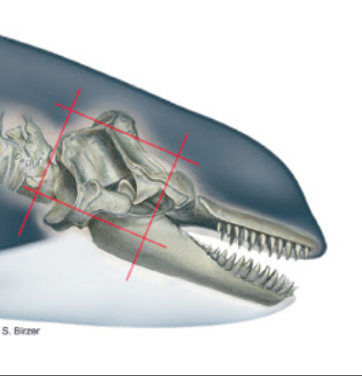
SB: In a way it did, yes. Whales are native to Puget Sound and I think of them as part of home; but as I found myself—in their innards?—I realized I knew little about them. I was working on a scientific illustration of *Orcinus orca*, Killer Whale. This was a composite illustration of the internal anatomy with five layers; the

Top: photo of Five Fingers Lighthouse with breaching Humpback whale in the foreground, © 2014 Jane Ruffin

Figure 1: (below left) Three images from the *Body Interiors* series; © 2010 Sharon Birzer



EDITORS' NOTE:
GNSI member Sharon Birzer asked Audrey Freudenberg for help in writing an article for the Journal. We were intrigued by the story and the nature of its telling. An interview format worked the best. We find that the nature of the telling reflects how the artist-illustrator both grasped the task and was overwhelmed by the subject. It illustrates the resulting synthesis, and gives some cautionary notes about managing scientists.



Orcinus orca, Killer Whale cranium [mirrored here], © 2015 Sharon Birzer, (with thanks to VZAP for bone scan reference)

Figure 3: (right) illustration of baby crow; © 2015 Sharon Birzer.

epidermis, the muscles, the bones, and the internal organs with special attention to the echo-location mechanisms and the breathing apparatus. That's what brought me to Fred Sharpe's talk at the 2011 GNSI conference in Olympia. Fred gave the keynote speech that year, "Ocean Salubrious;" and I asked him for possible resources for the illustration as I had come to an impasse in my own research.

AF: Fred Sharpe was one of the researchers at Five Fingers Lighthouse?

SB: He's a PhD Research Biologist, and he's been going up to Five Fingers for a couple of decades, researching humpback whales' foraging patterns and vocalizations. He's the link between the Alaska Whale Foundation (AWF) and the Juneau Lighthouse Association (JLA). He's also an artist—four of his pen-and-ink drawings, Orchids (two), Song Sparrow and Black Turnstone, ended up being used on the interpretive panels we created for Five Fingers Island. He also conceived and wrote the text for all of the panels, with contributions from Andy Szabo, Fred's colleague at AWF. Fred and Jennifer Klein of JLA had written and received a grant from the State of Alaska to fund both further hydrophone work to record the whale vocalizations and the creation of interpretive panels to become permanent installations on the island, describing the island, its history, its biota, and the role of the humpback whale research being done there.

They wanted building names for the five buildings, welcome signs on both ends of the island—there are only really two places to land, the way the rock layers jut out—and we created 6 interpretive panels about the intertidal and upland ecological zones on the island, the history of the lighthouse, the geology of the area and the bigger picture, and two panels about the research being done there (Figs. 5, 6, 7).

The Five Fingers Interpretive Project was to last several years. With the challenges came benefits:



my daughter Mallory and I got the opportunity to volunteer on this remote island and watch the researchers at work. I had the chance to explore my interest in whales and learn more about everything there, including the lichens. The hand-done illustrations and photos of the gorgeous life forms, which I created for the panels, including the ocean life and the lichens, ended up being one of the most fascinating parts of the project (Fig. 2).

AF: Combinations of fungus and algae.

SB: Lichens are bio-indicators, a way to index climate change: which lichens are found in which places tell us what's happening with the air quality. Karen Dillman, an ecologist and botanist who studies botany, air quality, invasive species and climate change working for the USFS in Petersburg had been contacted and invited to join us to begin a lichen survey. She was kept off the island by six-foot seas, but she later helped corroborated my lichen identification through photographs.

I was in charge of producing the panels. It actually ended up taking a tremendous amount of time, more time than I thought it would. I was the de facto project manager; Fred Sharpe drove the content.

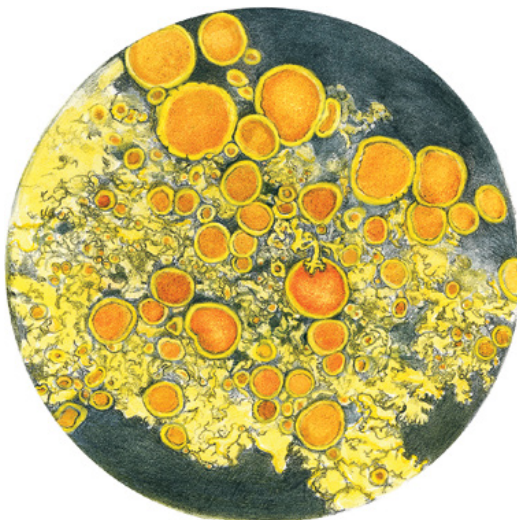
The budget I was allotted had to cover not just the fabrication of the images, but everything down to the hardware: these were to be permanent installations on an island that experiences below-zero temperatures much of the year. The printing process alone was expensive and permanent signage is even more so. Then, too, we didn't want to litter the island! But there are regular visitor stopping points; the geology forces your hand with panel placement.

All images for the panels — both photographic and traditional illustrations — had to start at a really high resolution, at least 600 dpi.

The researchers tended to think that my

Figure 2: Two species of lichen drawn for interpretive panel (see Fig. 6), © 2015 Sharon Birzer

(bottom left) *Candelaria Meneziesii* on sitka spruce twig
(bottom right) *Xanthoria* sp.



deadline for the images was their deadline for text; they didn't fully realize that I was working around their text, so I learned some things about project management! The scientists' resulting text was really beautiful ("A green encrusting sponge competes for space with a red encrusting algae."); it was very hard to choose what to feature! There is evidence of life everywhere. Even the trash is interesting: have you heard of middens? Those are the trash-heaps, shells and carapace left mostly by the birds. There are no land predators on the island so I could get fairly close to observe a baby crow and it wasn't even scared.

AF: Is that why you chose to illustrate the crow, rather than use the photograph (Fig. 3)?

SB: I suppose it's unorthodox to use a sketch (the baby crow) in the middle of a photograph, but the result is somehow softer while being more descriptive. One of the challenges was that the place is so big and beautiful, and we were trying to create these somewhat educational panels—

AF: Somewhat?

SB: There was no way we could include everything. And with drawings, you can make the most of the space you have; you can put things together that might not otherwise be; you can call out the defining detail. These Oystercatchers [Fig. 4]: some photographs don't show that they have almost orange yellow eyes—as bright as their beaks are orange-red. I also just think it's softer; illustration is slightly digested for the viewer. I used several of my own photographs and field sketches of observations of the Black Oystercatchers to create that illustration. I wanted to put the different views of the animal together, and they were there as a group so I chose my favorite "poses". It's possible that strict scientific illustrators frown on this idea—

AF: Like the ongoing debate about the role of the Supreme Court: what is creation, what is interpretation?

SB: We love going to films to see the vision of the filmmaker. I think really hard-line scientific illustrators aren't supposed to have a style; it's supposed to look like a clarified photograph. I admire that work, but this job wasn't just a straight report. We could do some translating. We had to just sample the ecosystem, anyway, as we had no hope of reporting it in its entirety. The interpretive panels were intended to help people connect with and



Figure 4: Black Oystercatcher illustration and sketch (for Upland panel below), © 2015 Sharon Birzer

celebrate the place rather than be overwhelmed by it. What we wound up doing with the text and then with the panels was to underscore the experience of the wildlife: the panels teach you to explore, to notice.

AF: Suggesting that you go and discover more than the panels can teach you.

SB: Yes!

AF: I wonder whether illustration doesn't open a more participatory process than photographs for the viewer? Through mirror neurons people could technically imagine themselves participating in the image creation, imagine their own hands making those marks. A photograph doesn't give the ordinary layperson a sense of how they might break down three dimensions into two.

SB: I think that's true. We relied on photographs for overall landscapes, but yes; the drawings were ways we chose to highlight the defining features. Sometimes I think the photographs were more beautiful than the drawings I ended up using—however the drawings could synthesize the important

Figure 5: Upland island ecology panel, © 2015 Juneau Lighthouse Association and Birzer Studios

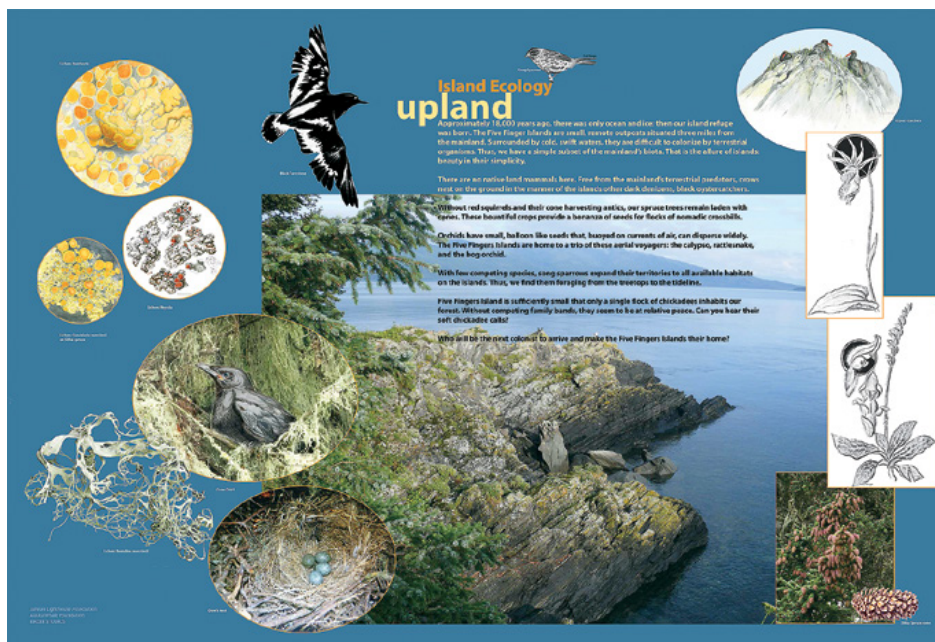




Figure 6: (top right) Intertidal island ecology panel, © 2015 Juneau Lighthouse Association and Birzer Studios

Individual images: (left) © 2015 Sharon Birzer:

Top: *Metridium senile* (Short Plumose Anemone)

Middle: *Katharina tunicata* (Black Katy Chiton)

Bottom: *Urticina coriacea* (Rose Anemone)



information from several photos into one image.

AF: and the photographs wouldn't have given the viewer the same whiff of the translational experience.

SB: Right. We get to learn about these species, and then we discern what information is going to clarify that species for the viewer, distinguish one from the other. Sometimes with the lichens you know you can't achieve this! It's an impossible job; but as we learn about the species we pull out the information that's key. Take some of these smaller creatures: if you just took a giant spotlight you wouldn't see the form anymore; you'd have flattened color. But I think you could say that we were going for an artist's view versus a highly technical illustrator's view. Just as knowing and understanding exist on a continuum so does science illustration. Fred and Jen were allowing me to interpret. It was a dream project, really. It was almost as though, if you could be a butterfly, what would you see if you landed?

AF: So that if a person were, themselves, able to zoom in and out on a sample, or get a different view under bright light, they could refer to your sketches to distinguish features.

SB: Right, exactly. And I got to take lichen samples home; those 18 days were just not enough time to get all the relevant information to get the drawings done.

AF: It's the little things.

SB: But the big things: the whales? Those researchers have identified and named close to a thousand

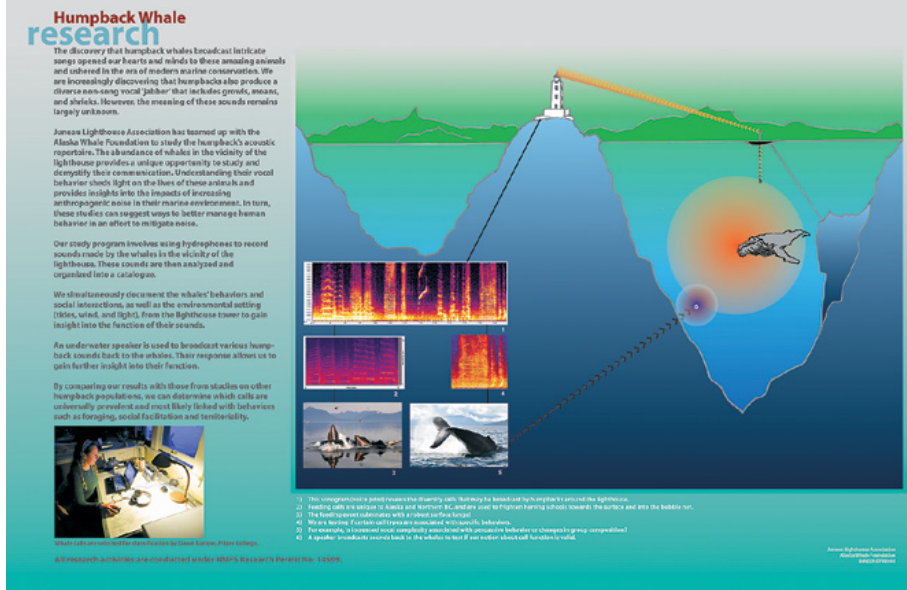
humpback whales (*Megaptera novaeangliae*), based on the different markings on their flukes. The whales come into Frederick Sound after little things, I guess—that's what the Oceanography panel ended up describing; the upwellings and currents combined with the ice-age geology that carved the sound into a place where, helped by the forces of nature, the krill and fish collect in abundance. The panels about the Oceanography and the Research, though—those were based on Fred Sharpe's schematics. I interpreted his diagrams and translated them into a tableau in Adobe illustrator, adding clarifying images (Fig. 7).

AF: You made six panels altogether?

SB: There are six interpretive panels including the Upland and Intertidal Zones of the island. The Upland area—so named because Five Fingers is uplifted granite from the ice age, all these layers jutting up and out. The upper part of the rock is habitat for plants and birds. Then there's this broad band of steep rock covered in seaweed and the life you'd normally associate with tide pools: the Intertidal Zone. It's often in various stages of being covered and uncovered by water as water levels fluctuate with the tides. Fred, myself, and, on a couple of occasions, volunteers photographed plants and animals I ended up illustrating.

AF: You did some of the drawings from life, and some from photographs you took home?

SB: Photographs and field sketches were the basis of the illustrative portion of the work. But the lichens I had to look at through a dissecting 'scope. I could only see one area at a time; I didn't get the full view that you see on the panel. The depth in *Xanthoria* [Fig. 2]—that is like a moonscape; maybe I didn't do it justice because I didn't want to put too much shadow in it. It doesn't show up like this on any camera or dissecting scope that I have: I had to focus back and forth as I drew and painted—focused down into



Interpretive panel design, illustration and photography by Sharon Birzer at Birzer Studios. Photos, text, and black and white illustrations (Orchids, Song Sparrow and Black Turnstone) by Fred Sharpe. Text by Andy Szabo at Alaska Whale Foundation. Bathymetry by Robert Szucs/Alaska Whale Foundation. Additional assistance by Jennifer Klein of Juneau Lighthouse Association. The panels are viewable online at: www.sharonbirzer.com/Gallery/interpretiveillustration.aspx

valleys. I did kind of flatten it so you can see it better.

AF: You had to make parts into a whole.

SB: That was the composition challenge for the whole project: to make all the panels look like part of a whole, whether they were about systems or populations.

AF: It feels like an odd time to ask you about beginnings, but how did you approach those design decisions?

SB: I know, I kept getting distracted by individual organisms and details, then as now! We started with biological surveys. I followed Fred Sharpe around the island during his surveys, taking notes and taking pictures. He knows how to identify all the species.

AF: You credited him with some of the inset illustrations on the panels.

SB: Yes; I edited images of the Calypso and Rattlesnake Orchids done by Fred, to get them to high resolution; also the lovely Black Turnstone and the Song Sparrow, all on the Upland panel. Fred's illustrations and writing can be seen in the books *Birding in the San Juan Islands* and *Wild Plants of the San Juan Islands*.

AF: And, of course, birds make up the chief vertebrates on the island—as you said, no land predators. Or should I say, the chief vertebrates except for humans?

SB: I was fascinated by the role of the researchers. You know, I found this mystifying even as I put it on the panels, but the researchers have begun to *play back to the whales* some of the vocalizations they collected in the past. They are observing the whales to see if they can measure any response to these recordings.

AF: I would think that might be confusing to the

whales. 'Wait, that's Viking Petal's voice, but Viking Petal is right here, making no noise. What's up?'

SB: Again, the trick seems to be trying to isolate part of the animals' experience; but it seems complex and mystifying.

AF: Trying to foster a sense of an experience rather than pretending to reproduce it in its entirety.

SB: Yes; it's a long way to go.

AF: Do you want to go back?

SB: I'd love to go up there again. I hope to go to see the interpretive panels and signage work installed on the Island. We actually did get to continue the work at the Center for Coastal Research on Baranoff Island, my daughter Mallory and I, in the summer of 2015. That is when we worked with AWF and Robert Szucs who produced the bathymetry for us.

AF: One experience leads to the next.

SB: It's a continuum. Part of the work was funded under the Scenic Marine Byways Grant which had been awarded to Jennifer and Fred, Juneau Lighthouse Association by the State of Alaska.

I also want to recognize Fred Sharpe, Andy Szabo, and Robert Szucs and generous volunteers for their contributions of text, photography, reference materials and bathymetry maps. Like I said, a dream project.

Figure 7: Humpback whale research panel © 2015 Juneau Lighthouse Association and Birzer Studios

Bottom: photo of Sharon working, © Fred Sharpe



FROM THE LIST!

— Stephen DiCerbo, R-R-R-Ripped Editor

Choosing an Archival Printer

ORIGINAL POST—

Marla L. Coppolino:

January 6, 2016

Dear Friends,

I'm considering purchase of an archival quality printer for producing prints of my art and photography work.

One recent online source (not affiliated with any printer company) recommends either:

- Epson SureColor P600 (uses pigment inks; higher end, in the \$700 range), or
- Canon Pixma Pro-100 (uses dye inks; lower-mid range, the \$300 range).

I am aware that the bigger, longer-term expense is the ink cartridges, plus the obligatory hassle of keeping the machine in regular use to avoid clogging.

I invite opinions on your experiences. Thank you!

Happy and creative wishes to all for 2016!

Marla

RESPONSES—

Linda Feltner:

If you want archival, you should focus your research on archival pigments. This also includes matching paper. Pigmented inks are more archival. Dye inks are not, as far as I have been instructed.

So if you want archival, that may be a primary factor.

I'm sure others who have their own equipment will have advice. I use a museum-quality, control-freak (her own words) specialist to do my archival printing, and she is extremely serious about archival quality, along with the printer, ink and paper that all have to be matched for archival quality.

Jennifer Landin:

I don't have a suggestion on printers, but I received advice from a printer repair shop re: clogs. I was told to use the power button when I turned the printer off (I'd had the printer on a power strip). If you use the power button, it cleans the print head before powering down.

Just thought I'd pass on those words of wisdom. I

bought a new printer, followed the advice, and haven't had a clog since.

Lore Ruttan:

I've also looked at both of those in preparation for the day when my Epson R1900 truly quits. My understanding is that the Canon would be appropriate for cards but the Epson would be better for prints. Two reasons. One, even though the new dye inks resist fading for much longer than the older dye inks, the pigment based inks are even more archival/long lasting. Two, the Canon supposedly produces a brighter more saturated image while the Epson produces more "natural" looking colors. I suppose it depends on what your work is like and this is just what I've read.

I have loved my Epson R1900. Yes, the paper feed can be fussy but the images are beautiful.



Karen Ackoff:

I tend to like Epson printers, though some of the higher-end Canon printers are also highly regarded.

The newer Epson pigmented inks tend to clog less. However, if you find your inks do clog regularly, you can try one or both of the following:

I used to keep a guitar humidifier tucked inside the printer. You have to add water to the small humidifier about once a week, possibly twice when central heating is on. I tucked it inside and out of the way, and though I could print with it in place, I recommend removing it while printing. You could also make your own by using a travel container for soap, punch holes in the top, and put a damp sponge inside.

I wrote a small program that printed a page with a stripe of each color once each day. I believe these printers are designed for frequent use, and printing this page daily helped keep ink jets clear and working. When I did this, I only rarely had to run a cleaning cycle. You do waste some paper this way, but I re-used the paper, printing on both sides, and then used it as scrap paper. And then I recycled it.

I have a newer (used) Epson now, and it hardly ever clogs, and I don't do anything to it.

Another major consideration is the size of paper the printer will take. Clearly this increases the price of the printer, but if you need to print larger prints, a printer that only handles 8.5 x 11(14) isn't going to get the job done. Some people like printers that can use roll paper - that is how I got my new/used Epson (the owner needed to use roll paper, and this model doesn't accept rolls). I print on sheets, so it doesn't matter for me. Paper choice is a consideration for how the inks perform. I stick with Epson inks and paper. The paper isn't cheap, so I always do a test print, at a lower res, on cheap paper first.

If you want archival, pigmented inks are the way to go.

I also recommend that you familiarize yourself with basic color management and that you calibrate your equipment. This can entail do-it-yourself or you can use color calibration hardware/software. Everyone I know that has worked professionally and has used the (expensive) hardware/software solutions ends up going back to do-it-yourself. I spent an afternoon with my new printer, and have got calibrated spot on. You might try REAL WORLD PRINT PRODUCTION as a reference.

Deborah Shaw:

Thought I'd chime in with anecdotal and researched evidence:

I had an Epson 4900, (archival inks) which I adored, especially using the Enhanced Matte roll paper (archival), 17" wide x 100 feet long. I used a ColorBurst Overdrive color management system and a color calibrated monitor, and could get wonderful prints on both archival sheets and roll paper. Never had a clog, ran like a champ.

And then it suffered a horrific electronic death last month.

Turns out, it wasn't the print heads (my maintenance turned out to be stellar), but the authorized Epson repair folks said they'd been seeing a rash of the 4900s where the entire electronics went around the three-year mark for those owners who printed less than 3,000 prints per month. In other words, they had come to the conclusion that that model was, essentially, a "professional, high-volume" machine. Of course, my extended warranty ended in April of 2015 (sigh).

I enjoyed having the "extra" green and orange cartridges in the 4900, although I've been told (again anecdotally) that the green ink pigment tends to precipitate out more than the other colors, and has a tendency to clog more. I never had that problem. I felt I could achieve more natural-looking and closer color matches with those two additional colors (I'm reproducing mostly botanical illustrations/watercolors).

Like Karen, I always used Epson inks and papers. I was told to print at least a test strip once a week if I didn't have any other printing to do, and to remove, shake, and then replace each of the cartridges. Both the printer and the ColorBurst software had a test strip built in, so I didn't have to program it. If I was printing at least once each week, no problem, I didn't do anything extra. I'm near the beach, so lack of humidity usually isn't a factor, although the musical instrument humidifier is a good idea. Some folks use Windex on lint-less cloths to keep the heads clean and to remove minor clogs. There are good videos online that show how to do that for specific printer models.

I've heard industry rumors that Epson is supposed to release a new version of the 4900, probably called the SureColorP900. About a month ago they released larger versions that are called the Sure Color P series 6000 - 9000. They have some printers with and some



R-R-R-RIPPED EDITOR'S NOTE:

This occasional column R-R-R-Rips interesting exchanges from the GNSI Sci-Art Listserv. Anyone is welcome to join! Topics are varied, ranging from requests for advice on traditional media, business and marketing, exhibits and job opportunities, and sometimes advice on collecting road kill. For information about the Sci-Art Listserv, visit: www.gnsi.org/resources/reviews/gnsi-sciart-l-listserv

without the green and orange cartridges. I've heard all kinds of assurances that they've fixed whatever-the-problem-was in the electronics, and that the inks are more archival (up to 400 years, depending on the printer model), and clog less. They now have a choice of two different sizes of ink cartridges in some of the new models, which can be swapped out at any time. The smaller ink cartridges are for folks like me who don't do volume printing — because of the size they're even less likely to clog.

Personally, when I was researching which printer to buy three years ago, I found the Canon printers looked better for vibrant photographs, but felt too punchy and saturated for what I needed for reproducing illustrations and botanical art.

At the moment, the big table for the printer is empty, and I have not yet decided whether to save up and purchase another, or try to find an archival printing service that meets my exacting standards.

I get outside professional scans from scanning geniuses, even though I have desktop scanners. There isn't anything I could ever do that would come close on the scanning end of things. I have found two acceptable printing firms in the past; once I had them all trained for what I was looking for, they moved

away. So, I'm on the hunt again.

Karen Ackoff:

On the other hand, I had my old Epson printer for almost 8 years before I replaced it. The only issue I had was that it clogged all the time.

The enhanced matte paper is nice. I used the double-weight to print out student poster designs. My 3880 doesn't have green and orange cartridges, but it has black (matte and photo), light black, light light black, yellow, cyan, light cyan, magenta, light magenta, and light light magenta.

I recently replaced my 3200 Epson Perfection scanner with an Epson V700 Photo scanner. I don't care for the software interface, but I can work around it. I get amazing scans that capture all the detail I could possibly want. I do tend to scan everything at 3 times the normal resolution (1800 dpi) because I can always down-sample.

I should add that my work is small, so the scanner handles all that I need. The printer prints up to 17 inches - larger than I need. Should I ever need more, we have a printing house that can handle larger materials. I just have to remind them to dust off negatives (I had them scan a set of slides for publication a few years back).

Can't beat the results.

Geoff Thompson:

I only have a basic Canon printer but last year I saw photographer friends raving about the new Epson Surecolor-P800:

www.facebook.com/leswalking/photos/a.459415427430165.102782.253878294650547/919268784778158

I see online there is an A2 version and a 17" version.

Note Les is using Canson Platine Fibre Rag, which I believe he helped Canson develop for fine art printing.

In a talk last year Les explained that most commercial printer profiles are pretty useless, because modern USB spectrometers don't have enough power to use polarizing filters and thus read through the glare on darker color values.

Color calibration of screens and printers is tricky and you need a professional screen like an EIZO to see 99% of Adobe RGB color space. No screen can see more than Adobe RGB but if the image is in ProPhoto or another large color space, good printers can print colors you can't see on a screen. Most screens only see sRGB which is the color space of the cheapest possible CRT monitor from the 1980s. It also happens to be the default color space for Adobe Creative Suite,



Photoshop etc.! Most scanners seem to only scan in sRGB too.

Les's notes on his web page are useful for all this sort of stuff:

www.leswalkling.com/words/the-theory-of-practice

Sounds like it's worth waiting and saving if there is a new model of the 4900 coming.

Natalya Zahn:

For my 2 cents— I opted for investing in the best large-bed scanner I could afford, and I send all my files (fully corrected/prepared by me) out to be printed by a shop I really love in Brooklyn (I'm in the Boston area). I end up paying shipping, yes, so I try to double up on orders whenever possible, but since my scans are excellent, I never need to pay the printer to color-correct (I get a "fast-track" discount), and I never dump time into technical issues and material (ink/paper) stocking. My printer is able to print on a full range of art papers, including a 120 lb Arches Aquarelle that's basically the same as the paper I paint on. For ME (and I totally understand why someone else could arrive at a different outcome) I'm willing to pay a little extra (and charge my customers a little more) to outsource prints.

Barbara Harmon:

And—for you Natalya here's my 2¢— Pictex in Boston does quite an amazing job in my experience. Sounds like you already have a good relationship with your guys but you may give them a try at some point. Rich and Gary have always been crazy-meticulous. I've had many gicleés done by them; always excellent results. Not sure what their scanner is but usually they will include the cost of the scan when you buy prints, and they'll archive in their system as well as give you a CD if you ask. I haven't needed them for a few years but I recommend highly.

Britt Griswold:

I have used www.imagekind.com as a way to make prints for GNSI Members Exhibits. I liked the results. They also have a sales interface that allows you to price and sell your stuff to the public.

Barbara Harmon:

I am currently in a rather rural area of Florida. I have researched local printers and decided that considering the traveling and time lost there I'd be better off spending my time doing my own printing. But as said, I have not fully committed to that decision! I don't have this problem while in New England (Massachusetts). Great, amazing resources there, even locally on Cape Cod (in fact I just ordered

some prints from my shop there since I have yet to find the right substrate for self-sticking murals that I might use with this printer). But, if I continued with a distant printer, there are the logistics of multiple shipping destinations etc.

If I ever get the thing out of the box and actually functional, I'll let you know how it's going!

Geoff Thompson:

Good on you Barbara! Les is based in Melbourne, Australia. I know he offers a calibration service in this country. www.leswalkling.com/services/

It's not cheap but there must be good people in the USA doing similar things? I thought he had developed a commercial profile for Canson Rag paper. Perhaps it's one of these.

www.canson-infinity.com/en/icc-profiles

Lastly— Karen Ackoff:

ackoffstudio.blogspot.com

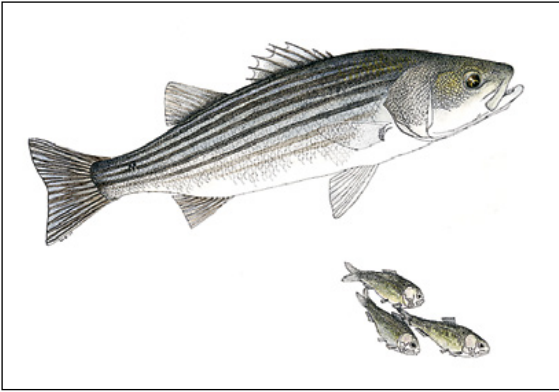
There was some discussion not long ago regarding archival printers. I've just posted a blog entry about making archival prints, adapted from my talk on scanning/printing at the 2015 GNSI conference. The blog post includes only basic information, but the settings provide a good starting point for anyone who wishes to venture into making their own archival prints.

R-R-R-RIPPED EDITOR'S NOTES:

With Karen's permission, her blog entry is reprinted for you (next page). Karen Ackoff has been an active player in the realm of fine art scanning and archival printing and has been a wonderful proponent of this facet of our domain. I was able to attend her presentation about this very subject at last year's Conference in Pennsylvania, and I recommend you do so if she is speaking again on the subject.—Thank you Karen.

Some discussion existed in the original online email list thread about the inevitable topic of taking the plunge and going this route of owning your own printer, or outsourcing... **I have tried to keep the Rip column here focused on you as a brave soul going into the abyss of ownership...** I, too, have just begun the journey of learning these processes. I wish to be able to produce my own gicleés and maintain control over the process. A big part of this consideration, as we have seen, is the initial cost of the venture.

I would like to add an additional option to consider if you choose to follow the path of becoming your own printer. Bide your time, and watch for sales and rebates. Assuming you go for an Epson unit, which is my recommendation, they do occasionally have price break offers, more seemingly at the end of the year. The rebates make you jump through a few hoops, but are well worth it.



Striped bass and mossbunker, © 2016 Stephen DiCerbo

Not mentioned in the online list thread is a route I took, in order to save money, and minimize the upfront investment. If you follow the offerings at the Epson store, at (www.epson.com), you will occasionally see refurbished units offered, when they have them... Although they do not carry all the same warranty protections as a new unit, sometimes the tradeoff is worth it. I was able to get a refurbished R3000 for \$529, when they were running a \$200 rebate at the same time. I was expecting my rebate to be rejected when they saw my receipt indicated my unit was a refurb, but they honored it... total investment \$329.

I did the same with an Epson Expression 11000XL Scanner, which I have been using, and I love it. The scanner came with a fantastic piece of software called **Silverfast**, which includes all you need to calibrate the scanner with and it's just a great interface to scan with. The R3000 printer will soon be put into service, and I do expect to get my money's worth.

About Papers: I do not have a watercolor background, and tend to look toward papers that resemble smooth Bristol. I have been very happy with Hahnemuhle FineArt Pearl and Canson BFK Rives. I will be trying some Epson ultrasmooth fine art paper soon. After the scanner, the profiles, the printer and the inks, I have found that it is absolutely amazing what a difference your paper makes in the process....

—Happy Printing!! — Stephen DiCerbo

Archival Printing

From Karen Ackoff's Blog, with permission— [ackoffstudio.blogspot.com]

MAKING ARCHIVAL PRINTS

In one of the the forums I frequent, there has been discussion of archival printers and printing. For those artists who make their own archival prints (or wish to), I am providing the settings that I use. These settings work for me. You should, of course, test any settings and make adjustments to suit your own needs and preferences.

The settings below are for an Epson Stylus Pro 3880 printer and an Epson® Perfection V700 PHOTO scanner, with Epson brand watercolor paper. I downloaded the profiles for the scanner and printer from the Epson web site. You should make appropriate substitutions for the equipment/materials that you use.

CONSIDERATIONS

Monitor: Calibrate your monitor. I work on Macintosh computers, and calibration can be accessed by choosing System Prefs > Displays > Color. Choose CALIBRATE and follow the

steps. You may wish to make/save more than one calibration if you work both daytime and evening, as light changes and can affect what you see on the monitor.

Scanner: All scanners are not equal. Consider optical resolution and optical density. You might also consider other features, such as being able to scan negatives or slides. Don't overlook the obvious - clean the scanner glass before you start. I use isopropyl alcohol because it doesn't leave streaks. At minimum and when scanning original artwork, I recommend scanning at 100% of the output size (the size at which the image will be printed) and 300 dpi. Output to TIFF or PSD formats. If your scanner has a high speed option, deselect it.

If your work is too large to scan, you can take a high resolution digital photograph or you might consider having a printing bureau make a high resolution scan for you.



MY SETTINGS:

SCAN: A scanner will produce an RGB image. If you plan to use the scanned image for making archival prints, leave the image as RGB (do not convert it to CMYK).

- Image type: 24 bit color
- Resolution: 1800 dpi*
- Scale: 100%
- Unsharp Mask: Low
- Speed Priority Scanning: Deselect
- Configuration: Color Control

*I scan at a high resolution of 1800 dpi as I sometimes need details of my work to illustrate articles for publication. By scanning at this resolution, I can always downsample my work AND I have adequate resolution for showing enlargements of detail.

PHOTOSHOP®: Check manufacturers' web sites for profiles for scanners, printers and paper products.

- Mode: RGB
- Convert to Profile: RGB profile
> Epson 3880 WC Paper
- Assign Profile: Epson 3880 WC Paper
- Color Settings: Working space >
RGB > Epson 3880 WC Paper

PRINT. Pigment-based inks are generally used for producing archival prints. A printer that has separate cartridges for each color lets you replace only the

color that you've run out of. When choosing a printer, consider the size of the output and whether or not you need to use roll paper.

- Color handling: Printer handles color
- Set paper size: 13x19
- Page Setup: Manual Rear
(depends on your printer)
- Media Type: Epson WC Paper
- Color Mode: Epson Standard (RGB) (or appropriate setting for your printer)
- Output resolution: 2880 dpi (the highest setting possible)
- DESELECT high speed printing
- SELECT finest detail

Before you print, run a test sheet to make sure the printheads are not clogged. Run a cleaning cycle, as necessary, until the heads are printing clean.

Scan of a work in progress, scanned at a high resolution of 1800 dpi on an Epson Perfection V700 PHOTO scanner. © 2016 Karen Ackoff

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