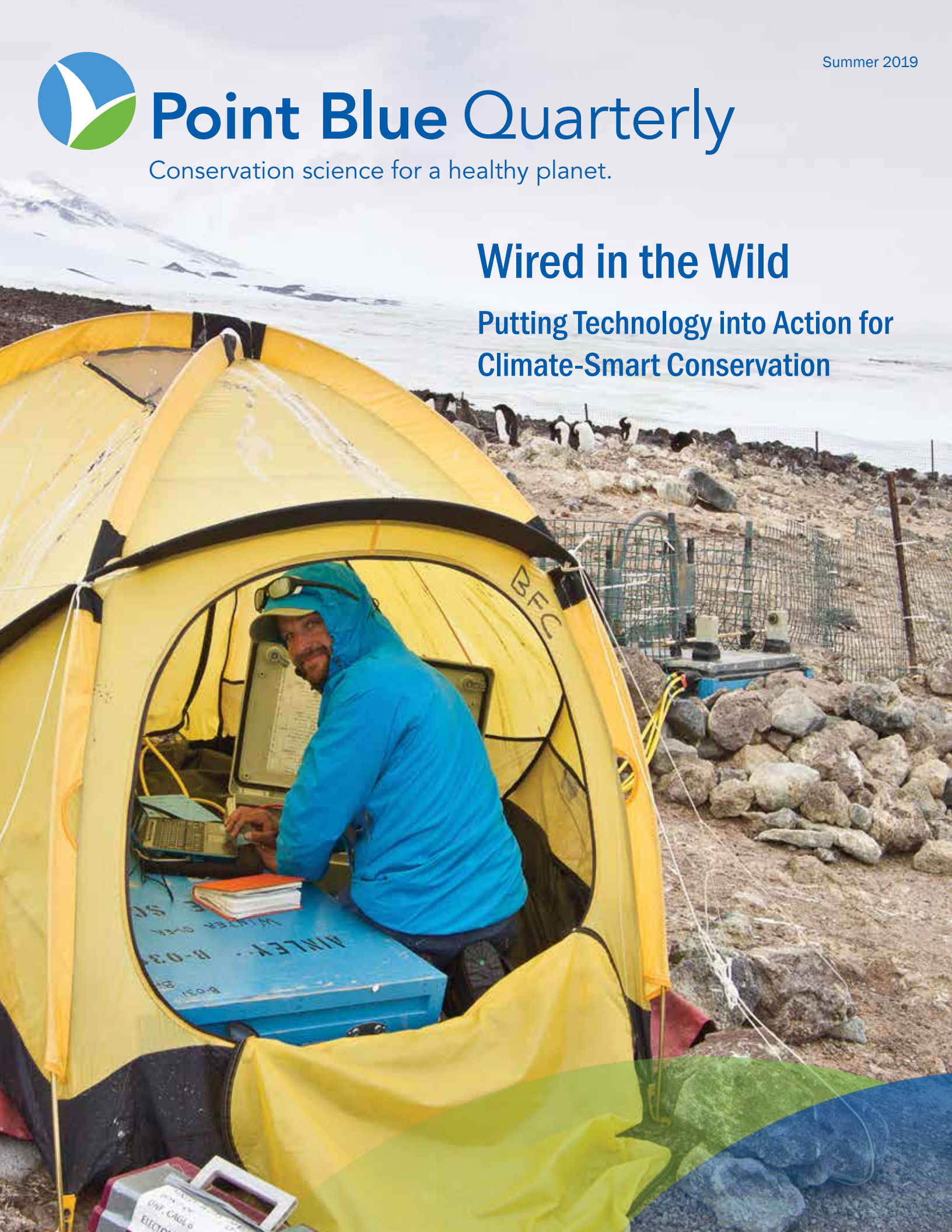
Summer 2019

Point Blue Quarterly

Conservation science for a healthy planet.



Wired in the Wild

Putting Technology into Action for Climate-Smart Conservation

Left: Manuel Oliva. Photo by Julie Chase Baldocchi.

Inspiration

I've spent my entire career pursuing innovative and ambitious solutions to the challenges of conservation and climate change. But I've never before felt such a perfect alignment of my skills and experience with the mission, trajectory, and culture of an organization as I feel at Point Blue. I'm excited to be leading this amazing organization, and I'm grateful to Point Blue's board, staff, and supporters for the warm welcome I've received since becoming CEO in April.

While the challenges we face to protect our critical ecosystems and wildlife are significant, every day that I've been here has had moments of inspiration. Hearing the stories of so many supporters of our work, including donors, agency partners, and even our Congressional representative, Congressman Jared Huffman, about how much they know of and value our work has been a great experience. And seeing our work first hand has been truly inspiring. At our Palomarin Field Station, I held my first bird (a Wilson's Warbler!), and I had the opportunity to marvel at the more than 50 years of scientific data in the field journals collected on the bookshelves, reflecting the longest-running avian dataset west of the Mississippi. On a trip to the Farallon Islands, I saw more than 30,000 Common Murres and hundreds of fur and elephant seals, and I felt proud that these species have seen dramatic increases to their populations since we began our science and conservation partnership with the US Fish and Wildlife Service in 1968.

But above all, I've been inspired daily by the intelligence, commitment, and passion of the incredible staff here at Point Blue. It's visible in the scientific rigor they bring to every project, the collaborative spirit they bring to each partnership, and the dedication they show to ensuring the work we do achieves real impact. And it confirms my belief that Point Blue is exactly the right place for me with the right set of tools to create impact and help foster greater ambition.

On the pages that follow, you'll read about some of the cutting edge technology our 160 scientists are using every day. Drawing from our 50+ years of experience, we're always looking for new ways to study the natural world. As we look to increase the pace and scale of our impact to advance climate-smart conservation, these tools are helping us assess the health of our planet and maximize nature's benefits for wildlife and people.

I'm thrilled to be part of Point Blue and I am more optimistic than ever that we can come together to make a difference in the face of the urgent threats we all face. And I look forward to meeting all of Point Blue's many supporters, partners, and friends.

Sincerely,

Manuel Oliva
Chief Executive Officer

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Left: Point Blue Board Member Peter Norvig, PhD. Photo by Kris Norvig.

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Scott Jennings, former Point Blue avian ecologist, enters Adélie Penguin data at a Ross Island, Antarctica, field site. Photo by Annie Schmidt/Point Blue.

Wired in the Wild

Putting Technology into Action for Climate-Smart Conservation

by Grant Ballard, PhD, Chief Science Officer

When I started as a volunteer at the Palomarin field station in 1991, I was impressed by the quantities of data that had already been collected. And I was eager to put the field station's two IBM "XT" computers to work to start summarizing some of it, with backups going to 5.25 inch floppy disks carefully stored offsite in case of fire. On my first trip to Antarctica in 1996, I learned to use radio transmitters to track the locations of Adélie Penguins. However, to actually determine where the penguins were, two researchers needed to climb to the top of different mountains and coordinate via radios as we cycled through different radio frequencies, waiting to hear the "pings" from the birds. Often we heard nothing but static, as the penguins had swum out of range of our listening posts.

Over the last thirty years, technology has rapidly advanced, revolutionizing the ways we understand and protect the natural world. And Point Blue has changed with the times, keeping pace with technological advances to ensure we're using every tool at our disposal to advance our mission. The organization now has hundreds of computers, and, of course, every researcher's cell phone is far more powerful than that original IBM XT. And as you'll read on the following pages, we can pinpoint the locations of penguins and other birds, even when they dive deep into the water foraging for food, without climbing to the top of nearby mountains.

Whether monitoring elusive wildlife from space or taking a "microbe's-eye view" on ranchland soil, Point Blue scientists are making novel use of technological advances to assess the health of our planet so that we can develop the most effective solutions to the toughest environmental challenges of our time. We hope you enjoy the following stories of how we're staying "wired in the wild."

Wildlife Trackers: The Next Generation

In the spring of 1804, a young John James Audubon placed thin silver rings on the legs of five Eastern Phoebe nestlings near his home at Mill Grove, Pennsylvania. When two "banded" birds returned the following year, it confirmed his theory that migratory birds return to the same area in successive seasons. While wildlife tracking has come a long way since that experiment—the first known instance of bird banding in North America—conservation biologists remain just as curious about the behavior and movement of the animals that share our world.

Understanding where animals live, how they function in an environment, and how they travel between habitats not only adds to our knowledge about the natural world, it can help us protect it. While bird banding continues to provide critical conservation data, it is complemented by new tools Audubon likely never dreamed of. Today, giant strides in tracking technology are helping Point Blue scientists learn how animal populations and ecosystems respond to threats from climate change, habitat loss, fisheries, and other human activity. The data we're collecting from high-tech tools can inform conservation actions that protect wildlife and, ultimately, the planet.

In Antarctica, Point Blue scientists are using technology-boosted monitoring techniques to study Adélie Penguins, a species that serves as a key indicator of the health of the Ross Sea Marine Protected Area. By placing tiny video loggers on penguins, our scientists are able to see what the penguins see underwater, developing a more nuanced understanding of the variables that make for successful foraging in a changing world.

Unoccupied aerial vehicles (UAVs, also known as drones) offer a different view of Adélie Penguin colonies. Historically, our scientists had to walk through the colonies to complete counts of chicks and adults. At Cape Crozier, where the Adélie Penguin colony contains around 300,000 nests, conducting an on-the-ground census is quite a cumbersome task. In collaboration with Stanford University and Conservation Metrics, Inc., Point Blue Scientists are developing a new multi-UAV system that will be able to survey the entire colony in a few hours, capturing photographs in high enough resolution that computers will be able to count the penguins and even distinguish between adults and chicks. As the pace of global change accelerates, population assessments like these are

Opposite page: Chief Science Officer Grant Ballard, PhD, observes penguins near the Ross Sea, Antarctica. Photo by Annie Schmidt/Point Blue.

Above: A Black-headed Grosbeak, captured in a riparian forest in the Point Reyes area, is carefully outfitted with a GPS tag by our Palomarin Field Station biologists. Photo by Diana Humple/Point Blue.

becoming an increasingly important way to monitor impacts on wildlife.

Closer to home, scientists at Point Blue's Palomarin Field Station continue to be at the forefront of small-bird tracking technology. Early adopters and contributors to the field, our avian ecologists are now deploying next-generation geographic positioning system (GPS) loggers, which have only become small enough and light enough to place on songbirds within the past three years. "Tracking data help us understand the conservation challenges for migratory birds across their entire life-cycle: on their breeding grounds, wintering grounds, and in between on migration," explains Palomarin Program Leader Diana Humple.

In an ongoing study, Point Blue scientists and partners at the Tahoe Institute for Natural Science placed GPS tracking tags on two populations of Swainson's Thrush, one of many species whose migratory connectivity we are studying. One population, breeding in the Point Reyes area, is robust. The other, breeding in the Sierra Nevada and southern Cascades, is much smaller and has declined. Data from the tiny tags have revealed that the birds from the mountain group migrate a longer distance—to Central and South America—and winter in areas with more forest loss than the coastal birds, which migrate to Mexico. "This helps us understand that, for this species, the birds that breed in the Sierras may be more vulnerable to environmental change compared to those on the coast," says Diana. Such insight has the potential to inform management and policy decisions for better conservation outcomes. For example, the data can help land managers prioritize habitat protection and enhancement at both wintering and breeding sites that are critical to the vulnerable mountain-breeding birds.

Conservation biologists have learned a lot since Audubon first banded Eastern Phoebes. Now, in video loggers, drones, GPS tags, and other devices—including those enduring bands!—we're still realizing the promise represented by those thin silver rings from over two hundred years ago.

by Stacey Atchley-Manzer

did you know?

Mobilizing Big Data

With new technologies revolutionizing data collection, we now have a higher volume of information on our natural world than ever before. Point Blue's scientists and informatics specialists analyze vast amounts of data and share it through tools and resources, elevating big data sets into actionable information for use in planning for our changing planet.

Real Time Data

Water Tracker provides up-to-date data on surface water distributions in the Central Valley, helping water, wetland, and conservation managers decide how to allocate limited freshwater resources to meet the needs of wildlife and people. At sea, data from our collaborative Whale Alert program help prevent endangered whales from being injured or killed by commercial vessel strikes in increasingly busy shipping lanes.

Data for a Changing Future

Our Coast Our Future provides coastal managers and planners with online mapping tools that help them understand, visualize, and anticipate vulnerabilities to sea level rise and storms in their area. And data from the Sierra Nevada Avian Monitoring Information Network helps partners like the US Forest Service figure out how to manage for fire in a climate-changed future.

Seals from Space

Satellite Technology Powers Community Science

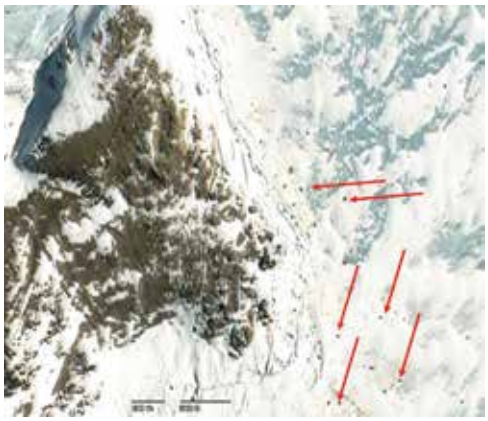
There are tens of thousands—maybe even hundreds of thousands—of Weddell Seals in Antarctica, and most of them are in remote, hard-to-access locations. Researchers think that seal populations may be threatened by a toothfish fishery operating in the Ross Sea region. Toothfish (sold in the US as "Chilean sea bass") are a critical food source for the seals, so the more the fishery takes, the less is left for the seals. But without an accurate baseline and ongoing monitoring, it's impossible to know if the number of seals is declining because of the fishery. Sending scientists to visit each remote colony to count seals would be dangerous, incredibly expensive, and logistically impractical. So what's a passionate conservation scientist to do? The answer is to take a whole lot of photos from space and ask thousands of volunteers from all around the world to help with the counting.

Until recently, this would have been impossible. The standard resolution for satellite images was 30 meters by 30 meters (about 100 feet by 100 feet). While this resolution was good for things such as determining basic land characteristics—like if vegetation was present or not—it definitely wasn't detailed enough to identify animals from the photos. But thanks to the latest camera technology and lower orbits, new satellites like the WorldView 4 are able to produce ultra high-resolution images at 25 centimeters by 25 centimeters (about 10 inches by 10 inches). Dr. Leonardo Salas, senior scientist at Point Blue and project lead for "Seals From Space," is coupling this new technology with the power of "community science." In community science projects, scientists use special internet applications to connect to volunteers who can help with time-consuming tasks computers are unable to do, and which can be completed surprisingly quickly with a lot of people-power.

With support from NASA and the National Science Foundation, Leo and his colleagues

Opposite page: A penguin's eye view of the Ross Sea, Antarctica. Photo by Fabrice Beauchene.

Above: Weddell seal and pup. Photo by pilipenkoD.



have recruited more than 380,000 community scientists to log in to a customized portal, view satellite images of Antarctica, and count any seals they see in that image. Select images are then double-checked by experts to ensure accuracy. "This project is an amazing example of disruptive technology in two primary ways," says Leo. "First, we are using a totally new approach to count changes in wildlife populations at incredibly large scales. And second, by engaging such a huge number of community scientists in the project, we're tying an important conservation question to the solution. We believe that the volunteers are becoming aware of the impact of their food choices through engagement in the project while providing critical data."

Since the team has access to satellite images going back to 2010, when the project is done they will be able to put together a comprehensive picture of what's happened to seal populations over the past ten years and whether or not the fishery is having a significant effect. "I'm very confident that we'll be able to provide meaningful science and recommendations to the agencies that manage the fisheries, ensuring that the needs of Weddell seals are considered as they set fishery limits." Assuming that's the case, 380,000 people should be proud of their contribution.

by Zachary Warnow

Eavesdropping on Birds to Map Biodiversity, Habitat Change

Soundscapes to Landscapes, a joint project between Point Blue, Sonoma State University, and other partners, is using technology and community science to understand which types of habitat in Sonoma County support different bird species. Tiny sound recorders called "AudioMoths" are placed on public and private lands around the county, where they stay for up to five days. The recordings are then analyzed by community scientists, who identify the songs of various birds. As they do this, they're training a computer algorithm to learn to identify birds on its own.

"Climate change is happening at a landscape level, but there's no way to get trained ecologists out recording data at that scale," says Rose Snyder, project coordinator. "Projects like this help us understand what's happening to the landscapes and monitor changes over time, using a mix of highly trained experts, community scientists, and powerful new technology."

Researchers expect that by the end of the project, they'll have matched a huge amount of audio samples from field recordings—possibly close to one million minutes' worth—to vegetation types identified from NASA satellite imaging.

"We're at a moment in time where our landscapes are undergoing dramatic changes," says Dr. Leonardo Salas, co-principal investigator on the project. "We're seeing the interrelated impacts of fire and climate change and noticing a loss of grasslands and forests, which are turning into scrub and oak woodlands."

By accurately connecting the habitat types that can be identified by satellites with the types of birds that are present there, we can identify which birds will be most threatened as the quality of the habitat changes over time. This will help researchers make informed recommendations to land managers if they notice a particular kind of habitat rapidly diminishing.

"One of the most inspiring parts of this project is that we're getting people from the community out into the field practicing science and participating in real research," says Rose. "From the landowners hosting the AudioMoths, to the volunteers placing and retrieving the devices, to those that are analyzing the recordings, everyone has a role to play, and everyone's contributions matter."

by Zachary Warnow

Unlocking the Secrets of Soil

It's a sunny, blue-skied morning on TomKat Ranch. Cows amble across the rolling hills, grazing on lush native grasses as a gentle sea breeze wafts through the air. But just below the surface of this idyllic Pescadero, CA, landscape, there's a bustling world that belies the calm above.

Although you wouldn't know it by looking at it with the naked eye, a handful of soil contains more living organisms than there are people on Earth. A single tablespoon can be home to millions of staggeringly diverse microorganisms, including bacteria, fungi, and protozoa. Still, relatively little is known about these denizens of the underground. It's estimated, for instance, that less than 2% of bacteria in existence have been described to date.

So what are all those microorganisms beneath our feet doing, anyway? As it turns out, quite a lot. These tiny creatures shape our world in a big way, influencing life above and below ground. They perform many important services that support life on Earth, including decomposing organic matter, purifying water, making nutrients available to other life forms, and helping to sequester carbon—a process through which plants draw CO_2 from the air and ultimately transfer carbon into the soil, helping to mitigate the effects of climate change.

Scientists, however, can only learn so much about soil microorganisms by peering through a microscope. That's why Point Blue's Senior Soil Ecologist Dr. Chelsea Carey is taking her research to the molecular level. Rapid advances in biotechnology are making it possible to apply genetic testing to the field of soil ecology, revealing the complexities of the busy subterranean world in unprecedented detail.

"The role of microorganisms in sustaining our ecosystems cannot be overstated," says Chelsea as she pulls a t-shaped soil probe up from a TomKat pasture. She carefully removes and bags the soil within, taking every precaution to minimize contamination from the above-ground world. Chelsea's getting ready to send this sample off to a government laboratory, where microbial DNA (the molecules that contain the instructions an organism needs to develop, live, and reproduce) will be extracted from the soil. She will receive back electronic files that contain information on millions of DNA sequences, which she'll then organize and interpret.

"While we still have much to learn about 'who' does what in the soil," Chelsea says, "DNA data can help us infer a microbe's function and glean information on how it survives and what conditions it prefers." Discovering which microorganisms are present and understanding how they contribute

Opposite page, top: Satellite image with arrows indicating Weddell seals. Photo by DigitalGlobe. Bottom: Community Scientist Emma Forester places an AudioMoth recorder on CA Department of Fish & Wildlife land in Sonoma County. Photo by Rose Snyder/Point Blue.

Above: Chelsea Carey, PhD, collects a soil sample on TomKat Ranch. Photo courtesy Chelsea Carey.

to soil health can help Point Blue and our partners maximize the benefits that working lands provide to wildlife and human communities.

At TomKat Ranch for example, Chelsea is investigating whether particular microorganisms may be able to help gauge how successfully a landscape is storing carbon. "We need to search for leading indicators of the amount of carbon entering a system, and microbes are a great place to start," says Chelsea. She collaborates closely with the TomKat management team as she works to interpret the DNA sequences within the context of on-the-ground observations and other factors like soil texture, perennial grass cover, and grazing management. "The hope is that our science will help ranchers understand whether their management activities are sequestering carbon or not," she says. Armed with this information, landowners can take actions that may boost carbon intake—tactics such as applying compost amendments or planting oak trees. "It's really exciting to be working at the leading edge of scientific discovery and to be able to use this information to inform on-the-ground action," Chelsea says.

In the future, she'd like to see soil biology explicitly considered in land management plans, and DNA sequencing more broadly used as a conservation resource. "We have a ways to go before we get there," she says, "but our work at TomKat Ranch is helping to forge the way."

by Stacey Atchley-Manzer

Opposite page: Point Blue partner biologists field test Quick Carbon tools. Photo by Quick Carbon.

Above: A handful of soil can contain more living organisms than there are people on Earth. Photo by Igor Stevanovic.

did you know?

DNA Technology and Conservation

Point Blue scientists turn to DNA analysis when they need to explore the natural world in extreme detail (see page 9 to learn how we're taking a "microbe's eye view" of soil to maximize nature's benefits on working lands). We're unlocking genetic information to advance climate-smart conservation science, on land and at sea.

Microbial Ecology of Seabirds

Seabirds host diverse communities of microorganisms, some of which can influence metabolism, protect from or cause disease, and affect immune system development. In one Farallon Islands seabird study, Point Blue biologists and partners collected baseline DNA data that could be used to identify the existing bacteria and virus community on Cassin's Auklets, Pigeon Guillemots, and other seabirds. A separate study investigated the microbial communities of Western Gulls, a species whose encounters with human food sources may increase the likelihood of picking up foreign or pathogenic bacteria. "If we know what pathogenic viruses are present in a population," explains Senior Marine Ecologist Pete Warzybok, "we can anticipate problems, suggest potential mitigation actions, and hopefully prevent disease outbreak."

Environmental DNA

Environmental DNA (eDNA) can be collected from bodies of water and offers great potential for monitoring and detecting species of interest. Point Blue's ACCESS (Applied California Current Ecosystem Studies) program is part of an eDNA proposal to test water samples for marine organisms as a new method of ocean research.

PARTNERSHIP

Quick Carbon

Moving the Needle on Climate Change

Carbon. It's a fundamental building block of life, but an excess in our atmosphere means rising temperatures, increased acidity of our oceans, and a threat to life as we know it.

When it comes to mitigating global climate change, one of the most promising options we have is to get carbon out of the air and into the soil. Land management practices such as regenerative agriculture—farming with techniques that improve the health of the land—show excellent potential to build up and store carbon underground. Knowing how much carbon is stored in the soil is the first step to increasing it, but ranchers, soil scientists, and other stakeholders have been hampered by a lack of accessible, efficient, and reliable means of measuring it. This means that testing is done less frequently and on smaller portions of ranchland than is ideal to accurately quantify soil carbon stocks on a landscape scale.

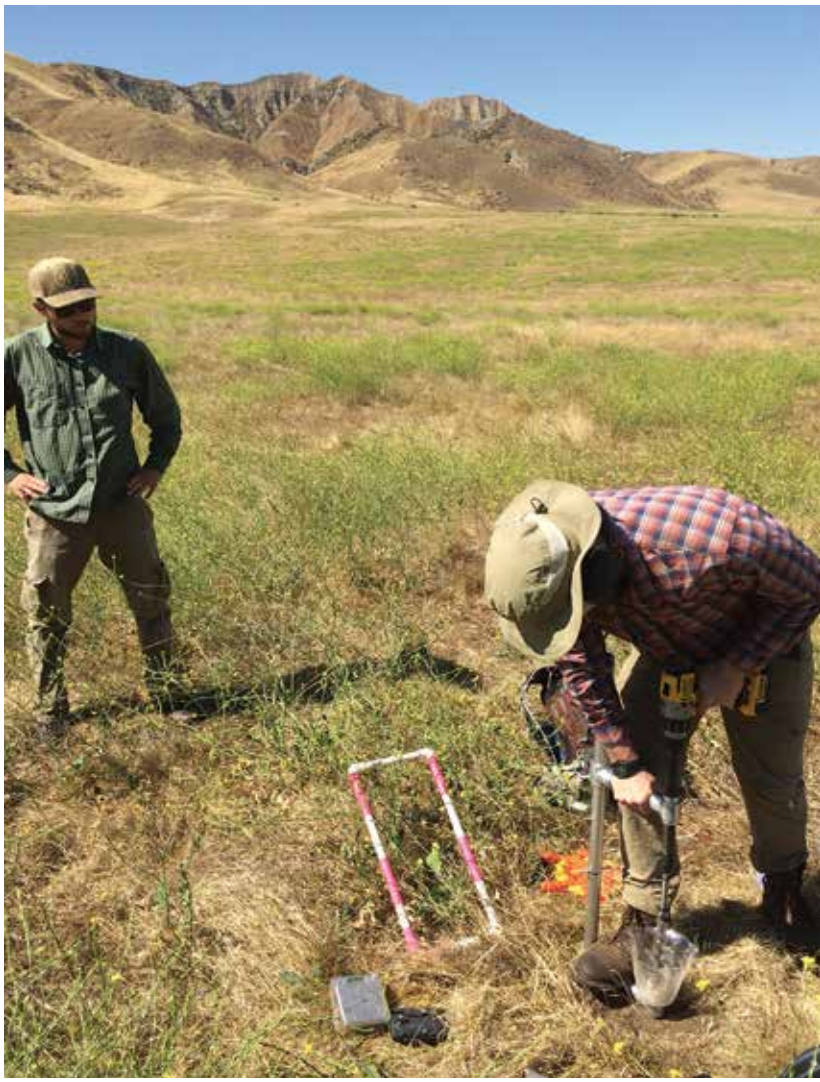
Enter Quick Carbon, a research program at the Yale School of Forestry & Environmental Studies. Over the past three years, Quick Carbon has pioneered an open-source technique to rapidly measure soil carbon in the field. Using low-cost spectrometers and machine-learning algorithms powered by spectral and geospatial data, the tool will enable land managers and researchers to instantly generate estimates of soil carbon, anywhere in the United States.

"Our field technicians and partner scientists from Point Blue and other organizations have collected over 6,000 soil samples in ten states," explains former Program Director Charlie Bettigole. "Over the next two years our goal is to use this dataset, along with publicly-available soil archives, to build a fully-automated, cloud-based soil carbon estimation tool." The breakthrough will give decision makers confidence in soil stewardship strategies—growing cover crops and using no-till farming methods, for example—and associated carbon storage outcomes.

Point Blue's scientists are helping Quick Carbon to calibrate and test methodologies across a range of management regimes in California—an important step in moving the tool from research into action in the coming years. "As an open project, we're eager to engage with partners that can help us move the needle forward," says Charlie. "We were excited by the soils work that Point Blue was already doing, and thought that a partnership could be mutually beneficial—we would gain valuable data to move our tools forward, and Point Blue could contribute to the development of a tool that would enable lower-cost soil sampling," he explains.

According to Charlie, many nonprofits and government agencies want to transition to management practices that facilitate greater soil carbon storage. "Travelling around the country for this work has opened our eyes to the vast number of producers and organizations making soil health a priority," he says. Quick Carbon has the potential to help them understand and manage for carbon, ultimately benefiting life on working lands and beyond. "I stay hopeful seeing ranchers and farmers from across the country (and world) passionately moving soil health into the mainstream," Charlie says. "The more producers getting out on soil crawls, down into soil pits, and monitoring ecological outcomes, the more I feel optimistic that all of this can make a larger impact on the planet."

by Stacey Atchley-Manzer



MEET THE TEAM

Dennis Jongsomjit

Technology is in His Nature

In a living room tucked deep within the urban sprawl of Los Angeles, a young Dennis Jongsomjit sat rapt in front of his television set. He imagined being transported to the forests, meadows, and tundra that came to life before him, wondering what it would be like to observe, and maybe even work to protect, the animals that populated his beloved wildlife shows.

Today, technology is still helping Dennis visualize and explore the natural world, albeit through more sophisticated tools than his childhood TV. As GIS (Geographic Information Systems) Specialist, Dennis uses spatial data and technology to model, map, and investigate the impacts of climate change and other threats to wildlife populations. "The GIS data I use comes from a range of high-tech sources," says Dennis, "from miniaturized tags on birds that collect data such as location, temperature, and depth to satellites that monitor and describe all kinds of conditions on Earth, such as the presence of water, plant productivity, habitat types, and sea ice conditions."

The application of GIS technology to the conservation field takes many forms, and Dennis contributes to Point Blue's climate-smart science in a variety of ways. Projects he's worked on include modeling the effects of sea-level rise on tidal marsh habitat around San Francisco Bay, as well as examining the potential future distributions and abundance of vegetation and birds throughout the western US and northern Mexico.

By pairing Point Blue's rigorous data collection with the power of analysis and visualization tools, his work helps resource managers prioritize conservation investments and inform land management decisions.

"Ecology and conservation studies will always depend on a field biologist with a pencil and a notebook," says Dennis. "But technology is enabling us to describe and explore the environment that we and wildlife depend on, not only in more and more detail, but also at bigger and bigger spatial scales," he says. "This is essential if we are to increase the pace and scale of our conservation work."

Dennis has realized many conservation dreams in the years since those childhood afternoons spent engrossed in nature shows. He's tracked radio-collared coyotes in the foothills of the Sierra Nevada. He's banded songbirds in the Point Reyes National Seashore at our Palomarin Field Station. And as a current graduate student at San Francisco State University and recipient of a prestigious National Science Foundation fellowship, Dennis is conducting research to investigate how changes in sea-ice and climate will impact the migratory movements of Adélie Penguins in the Ross Sea, Antarctica.

He reflects on the power of technology—and dreams—to make what was once impossible, possible. "When I was an intern at our Palomarin field station, I heard my colleagues daydreaming of being able to see where our songbirds travel during spring or fall migration," he recalls. "It was largely a mystery, and the technology to solve it was not quite there yet." No longer just wishful thinking, advanced songbird tracking technology has enabled our avian ecologists to virtually follow birds like Swainson's Thrushes to their wintering grounds thousands of miles away (see our story on page 6 for more). "This allows us to do things like collaborate with other countries to holistically preserve habitat for migrating species," Dennis explains. "These kinds of breakthroughs will continue to happen—as long as we continue to dream about them."

by Stacey Atchley-Manzer

Opposite page: Peter Norvig and friend. Photo by Kris Norvig.
Above: Dennis Jongsomjit prepares to weigh and measure an Adélie Penguin chick before safely returning it to its parents. Photo by Point Blue.

CHAMPIONS OF CONSERVATION

Peter Norvig, PhD

Computing for Conservation

Peter Norvig knows a thing or two about problem solving. A noted computer scientist and Artificial Intelligence expert, his impressive career has been characterized by the pursuit of breakthrough solutions to complex technological challenges—big ones, like how to design a computer system that can control a spacecraft or "think" more like a human.

In his current role as Director of Research at Google, Inc., Peter oversees work on machine learning, the science of enabling computer systems to learn from data and make decisions with minimal human intervention. He previously headed the company's core Web search algorithms group, which developed automated machine translation, as well as speech and object recognition products. Peter also led what is now NASA's Intelligent Systems Division, overseeing the Remote Agent experiment that flew on the Deep Space 1 spacecraft. Among many other accomplishments, Peter has been a research faculty member at the University of California, Berkeley, is the author of more than 50 publications, and is a fellow of the Association for the Advancement of Artificial Intelligence, the Association for Computing Machinery, the California Academy of Science, and the American Academy of Arts & Sciences.

Lest you think Peter is all work and no play, he does find time for hobbies like travel, bicycling, and photography. He also enjoys time spent with his two adult daughters, his wife, Kristan, and the family pets. And then there's the occasional fun project, such as writing the world's longest palindromic sentence or sardonically formatting the Gettysburg Address as a PowerPoint presentation—an early viral sensation.

Peter joined the Point Blue Board of Directors in 2014, eager to explore possibilities at the intersection of computer and conservation sciences. He was encouraged by his neighbor Rebecca Patton, who was herself a board member at the time. "She suggested that my background would be useful to Point Blue as they moved from being a squadron of binoculars-and-clipboard birders to a leader in conservation data science," explains Peter. He was also energized by Kristan's commitment to animal conservation, and he looked to fellow leaders in the tech sector who were using their talents to help the natural world. "Charles Knowles (founder of Rubicon Technology and President and Co-Founder of Wildlife Conservation Network) served as a role model of someone who took what he learned in the software industry and applied it to conservation," he says.

Peter thinks the time is ripe for conservation scientists to more fully harness the power of technology in order to address our planet's most pressing problems. "There are many great opportunities coming together now," he says. "We have more data, from better aerial and satellite imagery, and from more devices in the hands of scientists and crowdsourced citizen scientists. We have open source software projects that are collaborating to make the software tools we need. We have more computing power available, and some new machine learning and statistical algorithms to take advantage of it. We have better visualization tools to understand what the data and models are saying. And finally, we have the people to do the work, although we could always use more help."

Point Blue, Peter believes, is in a prime position to leverage this watershed moment. "We face huge challenges to our climate, oceans, wildlife, and natural habitat," he says. "But Point Blue has shown how to bring together multiple stakeholders—scientists, citizens, foresters, ranchers, city/county/state planners—to take action that is making a difference." And that concept—convening great minds to solve big problems—is one that Peter can get behind.

by Stacey Atchley-Manzer

NEWS BITES

Gardali Elected AOS Fellow

Tom Gardali, Pacific Coast and Central Valley Group director, was elected to the American Ornithological Society Fellows at the organization's annual meeting in June. This distinguished honor is a testament to Tom's dedication to the study and conservation of birds. Fellows are nominated based on their "exceptional and sustained contributions to ornithology and/or service to American Ornithological Society."

New Climate-Smart Meadow Restoration Guide

Point Blue's Marian Vernon, Brent Campos, and Ryan Burnett have authored a new guide to climate-smart meadow restoration, available online at pointblue.org/restoremeadows. By strategically planting willows, creating beaver dam analogs, and taking other recommended actions, practitioners can help make restored meadows healthier and more resilient to climate change.

41st Annual Bird-A-Thon

Join us in the 41st annual Rich Stallcup Bird-A-Thon, September 15 - October 15. Identify and record as many bird species as you can, and have your friends, family, and community members sponsor you to benefit Point Blue. Visit pointblue.org/birdathon to register or donate today!

Alaska Wilderness Builds Connections for Conservation

by Melissa Pitkin, Director of Education and Outreach

This spring, I took the trip of a lifetime. I was lucky enough to explore Alaska's coastal wilderness on a cruise co-led by National Geographic's Lindblad Expeditions and Point Blue. Every morning, when I stepped out of my cabin, it felt like I was stepping into a postcard. The parts of Alaska we experienced were wildly beautiful, with very little evidence of people. Right from the beginning of the trip, it truly felt like a wilderness experience.

The boat we were on was relatively small, with just 60 passengers. Other members of the Point Blue community on the cruise included Dr. Grant Ballard, Point Blue's Chief Science Officer; Bennett Smith, Director of Philanthropy; and a host of other board members and supporters. Connecting with supporters, members, former staff—even a former Palomarin intern—was a deeply satisfying experience. We let curiosity about nature and each other drive conversation, birding, wildlife watching, and evening card games. Being together with friends that signed up through Point Blue created an extra connection that went beyond our shared passion for nature and into our shared passion for Point Blue's conservation science and impact.

It would be impossible to catalogue all of the incredible experiences of the trip, but a few in particular stand out. The first was on day three of the trip, when we climbed into kayaks and paddle boards and had the amazing experience of paddling alongside humpback whales. Being so close to these large, impressive creatures in their element was a first for me and so different from observing them from a boat. As supporter Katherine Jones said, "Up close and personal with humpbacks..... the experience of a lifetime!" On a few different occasions, we were treated to the sight of black and grizzly bears chomping on protein rich juncus and grasses, having emerged from their hibernation and eagerly awaiting the beginning of the salmon runs. Finally, on the last day of the trip I was wowed by Arctic Terns resting on floating ice chunks right in front of us, as we watched and listened to an active calving glacier from small inflatable boats.

Throughout the week-long expedition, participants had plenty of opportunities to learn more from Point Blue scientists about the natural world we were traveling through and the work we're doing to study and conserve it.

Trip participant Anne Scanlan-Rohrer said "I've been stumped in trying to express to friends how great our Alaska trip with Point Blue was, because no one superlative adjective really captures it all. The scenery was breathtaking, wildlife sightings were fantastic, and being in the company of such educated, friendly people—staff, crew, and other guests—made it the trip of a lifetime."

To spend so much time together with people like Anne who share our passion and vision was the "special sauce" that made the experience more than just a regular trip. It was rejuvenating and energizing and I returned to the office re-inspired by spending time in true wilderness, and I found myself feeling truly encouraged by the people who care for and support conservation science for a healthy planet.

We hope to see you on a Point Blue trip in the future!

focus

Rich Stallcup (1944-2012) was a Point Blue co-founder and naturalist extraordinaire. His original *Focus* essays inspired a love of nature and conservation. The column excerpted below was written in spring 1998. Read about our current work with Swainson's Thrush populations on page 6.

Spotty Thrushes

If the old-growth forests of the west are nature's cathedrals for us, the summer song of the Hermit Thrush must be their music. The Swainson's Thrush, which nests beneath vegetation smaller than the old conifers, is the Hermit's only real contender here in world-class bird song.

Except for the well-known back-to-tail (brown to reddish), contrast in the Hermit Thrush (HETH), compared with the Swainson's Thrush's (SWTH) upper parts of uniform mouse brown or rich brown, shape and behavior are the best visual ways to tell them apart.

Shape. HETH is more compact with a rounder head and body and shorter bill and tail than SWTH. SWTH is a longer, more horizontal bird that is more drawn out at each end than HETH and is especially pinched forward in the bill and face. HETH often has its wings drooped below the base of its tail, not properly folded in above it as does SWTH. The tail itself is usually cocked up for HETH and straight out in SWTH.

Behavior. HETH is very twitchy, often quickly raising and slowly lowering the tail. Kinglet-like wing-flicking, usually in sets of two or three, is frequent when HETH is perched. SWTH does none of this and is very still when perched, often staring in a spaced-out way into an imaginary berryland just beyond the thicket.

Timing. In California, HETH is a common nesting bird in coniferous and mixed deciduous forests of the Sierra-Cascades and is less common in the dark redwood and Douglas fir canyons of the damp west slope of the coast ranges, south to at least Limekiln Creek in southern Monterey County. Most of these summer birds (at least the ones from the interior) depart for Mexico in late August and early September. They are replaced in late September by HETHs that have nested in Canada and Alaska. Only a few of these winter in the snowy ranges, and the ones that do are at low elevations. Winter numbers of HETHs in the lowlands, though, including the central valleys, coast ranges, and much of southern California, are much higher than breeding populations there.

SWTHs begin to return from the tropics in early April, but their outrageous singing does not begin until the end of that month. They are abundant breeders in proper habitat throughout the coast ranges, very local breeders in the interior mountains, and migrants only in the central valleys and Great Basin.

Plumage. The most important marks are: 1) Color of the upper parts. All species except HETH are uniform above. 2) Face. Broad (but weakly defined) buffy spectacles (eyering and loreal area) on SWTH and a narrow (well-defined) white eyering for HETH. 3) Side and flank color. In California they are brown or brownish-gray for SWTH and gray in HETH. 4) Spotting. The spots on HETH are generally blacker and more well-defined than the browner, blurrier spotting of SWTH.

Voice. The songs are similar in pitch, resonance, and clarity but quite different in phrasing. HETH opens with a single note, then serves short phrases in rapid succession, alternating between high and low. SWTH has an ascending series of rolling phrases. Both songs are well broadcast and echoing.

In many ways it doesn't matter which bird is which (and it's rather certain that they are not too interested in what we call them). What may be more important is what they offer us. The music is free, and the music is life-enriching—a gift to those who really go to where these little creatures make their summer homes and really listen to their songs erupting in the mute woods.

Above: Swainson's Thrush. Photo by Trevor Jones. Opposite page, clockwise, from left: Pacific Coast and Central Valley Group Director Tom Gardali. Photo by Renee Cormier/Point Blue. Supporters Katherine and Steve Jones kayak with humpbacks. Photo by Rick Theis. Tree Swallow. Photo by Becky Matsubara. Alpine lake and meadow. Photo by Ryan DiGaudio/Point Blue.

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Students from Point Blue's Students and Teachers Restoring A Watershed (STRAW) program help restore creekside habitat on a private ranch. Photo by Point Blue.