

CAREERS

INTERDISCIPLINARY RESEARCH How to be comfortable as a jack of all trades **p.583**

CHASING SUCCESS Personality traits matter more than intelligence go.nature.com/29yirxf

NATUREJOBS For the latest career listings and advice www.naturejobs.com



ALESSANDRO BACCINI/WOODS HOLE RESEARCH CENTER

Amazonian community members collaborate with Wayne Walker to measure forest carbon.

COLLABORATIONS

Partners in knowledge

Building relationships with indigenous people opens up paths to good research — and mutual benefit.

BY GABRIEL POPKIN

Indigenous territories comprise roughly one-fifth of the world's land, and scientists who work in fields such as climate, ecology and astronomy can enrich their research by collaborating with the native residents. Indigenous people have long helped scientists to gain access to study sites and to local knowledge about everything from forest plants to astronomical observations to cultural traditions.

But alliances can be tricky to navigate when

past missteps have strained relations between visiting scientists and residents. Indigenous people rarely show up on author lists of studies, for example, and that slight — among others — has caused some community members to be wary.

That is beginning to change as members of indigenous groups around the world assert their roles as producers and preservers of knowledge, and are increasingly starting to earn university degrees and work as academic researchers. Nonetheless, scientists who will be doing fieldwork at indigenous

sites must proceed with care and respect (see 'Mutual benefit'). They should plan ahead to meet community members and secure their cooperation and consent to access sites and collect samples. They must incorporate and acknowledge community members' contributions to their work, and be open to substantive collaborations that go beyond just requesting knowledge or logistical support.

Eske Willerslev, director of the Center for GeoGenetics at the University of Copenhagen, discovered the importance of such steps in 2011. He was preparing to publish an analysis showing that Australia's Aboriginal people had arrived there long before any known group had left Africa or the Middle East. The work hinged on DNA from a hair sample — originally collected in the 1920s — that he had found at the University of Cambridge, UK. But his publication was imperilled when a co-author threatened to withdraw unless Willerslev secured formal publishing consent from living descendants of the community that the sample had come from.

Willerslev initially didn't understand his colleague's insistence and was concerned that a meeting could delay or even scuttle the project. But he flew to Australia to meet with Aboriginal representatives to discuss his research and the findings he planned to publish, and was thrilled to learn that the community was receptive and interested. His team published in 2011 with an endorsement from the Goldfields Land and Sea Council, which represents communities in the area where the original donor had lived (M. Rasmussen *et al. Science* **334**, 94–98; 2011). He now routinely consults indigenous leaders on palaeogenetics projects: last summer, with Native American support, he published a finding that a long-disputed body known as Kennewick Man was closely related to contemporary Native Americans (M. Rasmussen *et al. Nature* **523**, 455–458; 2015).

The partnerships between scientists and indigenous residents must be viewed as scientific collaborations like any other, says anthropologist Michael Heckenberger at the University of Florida in Gainesville. No visiting researcher, he says, should ever say or imply, "here's a proposal, excuse us, we sleep in your house but we'll go deal with the science part ourselves tomorrow". He has been proactive in establishing solid alliances with community members since his earliest fieldwork trips, and his efforts have been fruitful. When he arrived in 1993 at the Xingu ▶

► River headwaters in Brazil as a graduate student, he had planned to investigate some previously discovered prehistoric settlements. But two weeks into his stay, thanks to the relationships that he had forged, villager Afukaka Kuikuro showed him an ancient structure that was much larger and more complex than any Heckenberger or any other scientist knew of in the area.

After excavating that and other sites, Heckenberger published a study that helped to change scientists' understanding of the impact of indigenous people such as the Kuikuro community on the Amazonian landscape (M. J. Heckenberger *et al. Science* **301**, 1710–1714; 2003). The team named Afukaka and his brother as co-authors to publicly acknowledge their crucial role in the research. “Virtually everything that we did in the Xingu was in partnership with the indigenous folks, so it seemed not only reasonable but necessary to include them in the publications,” Heckenberger says. “Those guys are representing a significant number of Kuikuro.”

UNIQUE INFORMATION

Researchers who collaborate with indigenous communities can sometimes gain access to completely different types of data. Robert Gough, secretary of the Intertribal Council on Utility Policy in Rapid City, South Dakota, points to Pacific Islander chants about wind patterns, and a Great Plains tradition of depicting unusual events on buffalo hides. Both provide records of weather patterns. Although less quantitatively precise than an annual temperature series, such records could extend climate-variability data sets back to centuries before modern instrumentation became

available. “That’s something you can’t get from any library — you can’t Google it,” Gough says. “It’s just not in the Western data stream.”

And research partnerships are often mutually beneficial. At the 2009 UN climate talks in Copenhagen, leaders of the Lima-based Coordinator of Indigenous Organizations of the Amazon River Basin, which represents Amazonian indigenous groups, wanted help to tally the carbon stored in their forests. Ecologist Wayne Walker from Woods Hole Research Center in Falmouth, Massachusetts, was among those the group approached.

Walker and his colleagues lacked a reliable map of indigenous territories, so they worked with communities throughout Amazonia to gather those data and to validate their satellite-based forest-carbon estimates by measuring individual trees. In 2014, they published a peer-reviewed analysis of forest carbon in the region’s territories (W. Walker *et al. Carbon Management* **5**, 479–485; 2014). At last year’s UN climate talks in Paris, in collaboration with organizations from Central America, the Democratic Republic of the Congo and Indonesia, they released a wider-ranging analysis showing that at least one-fifth of all tropical-forest carbon lies in indigenous territories (see go.nature.com/29mhg2q). In both cases, indigenous partners were co-authors.

Walker is pleased with the high quality of the research, and community members say that the studies have helped to bolster their long-standing demands for greater recognition and rights with hard evidence that they are conserving forests. “These maps show that it’s not a joke — indigenous communities are protecting this area, and this is how much carbon we contribute,” says Mina Setra, deputy

secretary-general of the Indigenous Peoples’ Alliance of the Archipelago in Jakarta, one of the groups involved in the 2015 analysis.

BIGGER PICTURE

Scientists who visit indigenous sites must tread carefully around more than just authorship and terms of collaborations. Even what might seem like a neutral object of study can have profound meanings and significance for the people who live there. Ecologist Catherine Potvin of McGill

“We’re trying to give them the data they need to fight their own fight.”

University in Montreal, Canada, and a graduate student from her lab began a study in 2014 of the forest carbon in the Embera–Wounaan territories of eastern Panama. The

project was part of a larger effort to prepare the country for a proposed framework for giving developing countries money to reduce carbon emissions from forests.

Potvin and her student knew that some communities feared that the carbon-reduction programme would infringe on their traditional activities. So before measuring any trees, they met leaders of each community, explained the project’s purpose and gave the leaders time to discuss it among themselves. Ultimately, the communities concluded that the data would strengthen their positions in future negotiations, and granted access to their forests. A team of Embera–Wounaan youth conducted many of the measurements, which provided technical support for the researchers and helped the tribe to build its capacity to do future studies. “We’re trying to give them the data they need to fight their own fight,” Potvin says.

Although indigenous knowledge can augment scientific data, gaining access to that knowledge typically requires an investment, says Jarita Holbrook, an astronomer at the University of the Western Cape in Cape Town, South Africa, who has studied knowledge of the stars among indigenous people in Africa. For instance, members of some communities can be reluctant to put themselves forward as authorities on a topic. “It’s polite in some cultures to say, ‘I don’t know anything, you should talk to so and so.’ You have to come back with, ‘I did talk to so and so,’” she says. “It may take three or four times asking before they’ll start telling you the information.”

Whatever your field, be prepared to appreciate and evaluate information that hasn’t conventionally been part of the scientific discourse, says astronomer Duane Hamacher of Monash University in Melbourne, Australia. “Treating indigenous knowledge with the respect that it deserves can go a long way,” he says. “Making it a two-way sharing process is the basis of these collaborations.” ■

Gabriel Popkin is a freelance writer in Mount Rainier, Maryland.

MUTUAL BENEFIT

Making collaborations that work for everyone

When doing research in indigenous territories, work with community members to ensure that your projects yield productive outcomes for all. Here are some guidelines to keep in mind.

- **Build trust.** Indigenous communities want to understand what you plan to do and how it will affect them. Take time to explain your project and to answer questions. Arrange for interpreters if necessary. And be prepared to wait for a community to discuss your proposal and come to a decision.
- **Ensure two-way benefits.** Explain how the communities will benefit from your research. Don’t ask for help and then disappear once you’ve got what you need. Give copies of resultant publications to community members, and include a translation if appropriate. Acknowledgement

or co-authorship on papers helps to legitimize indigenous people as knowledge holders and creators. Collaborating on community-led projects, even if they don’t lead directly to publications, can also define your and your colleagues’ commitment to a mutually beneficial relationship.

- **Use free, prior and informed consent.** The United Nations Permanent Forum on Indigenous Issues has developed guidelines for these types of consent, and they apply to all activities undertaken on indigenous land (see go.nature.com/29jmdvq). Individual nations and communities might also have their own ethics standards for collaborative research.
- **Leave your comfort zone.** Be open to incorporating unfamiliar practices, like opening with a chant or prayer, into scientific meetings and discussions. **G.P.**

CORRECTION

The Careers Feature 'Partners in knowledge' (*Nature* **535**, 581–582; 2016) mistakenly referred to the practice of depicting events on buffalo hides as a Great Lakes tradition. In fact, it is from the Great Plains region.