

Interview with a Celebrity Cartographer: Daniel (daan) Strebe

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Daniel (daan) Strebe is a software engineer and specialist in map projections, in addition to being a map enthusiast in general. He has been a frequent attendee and contributor at NACIS Annual Meetings. Daan manages Maphematics LLC, and engineers Geocart®, a software package which handles map projection and reprojection.

Continuing CP's annual "Interview with a Celebrity Cartographer" series, daan was interviewed recently by 2013 NACIS Student Board Member Paulo Raposo.

Paulo Raposo

Daan, thanks. Really appreciate your willingness to take this interview for the CP readers. We'll head right into the questions.

Given that you are a map projections expert, you've got an aptitude for math, and mathematicians sometimes have really diverse subject-matter interests. So why maps for you?

daan Strebe

I don't know that I can give you a rational reason. I started being interested in maps at a pretty young age. I developed my first map projection in 8th grade. In fact, I still have that map. It was of world history. It turns out the projection already exists. It's called the Eckert I. Which, I thought was a fine thing when I discovered it already existed. At least it lent some sort of validity to what I had done. I didn't do a lot with creation of maps or map projections after that. I did create a couple maps of Middle Earth in my early teens, Tolkien's material. And of course, I consulted maps anytime I was going to go anywhere. I always found them interesting, highly useful. I poured over maps as a child because I couldn't really go anywhere, so I would go there on maps instead. So there was always this background of interest in maps, but I never spent a huge amount of time on them until the late 1980s issue of *National Geographic* where they announced their adoption of the Robinson

Projection and all of that was included in an article on map projections in general. I read the article on projections and thought that was interesting, and saw Robinson's projection and thought that wasn't so interesting, and thought I could do a lot better. And that turned out to be a little quixotic, I suppose, but that was the beginning of the vigorous interest in map projections.

Paulo

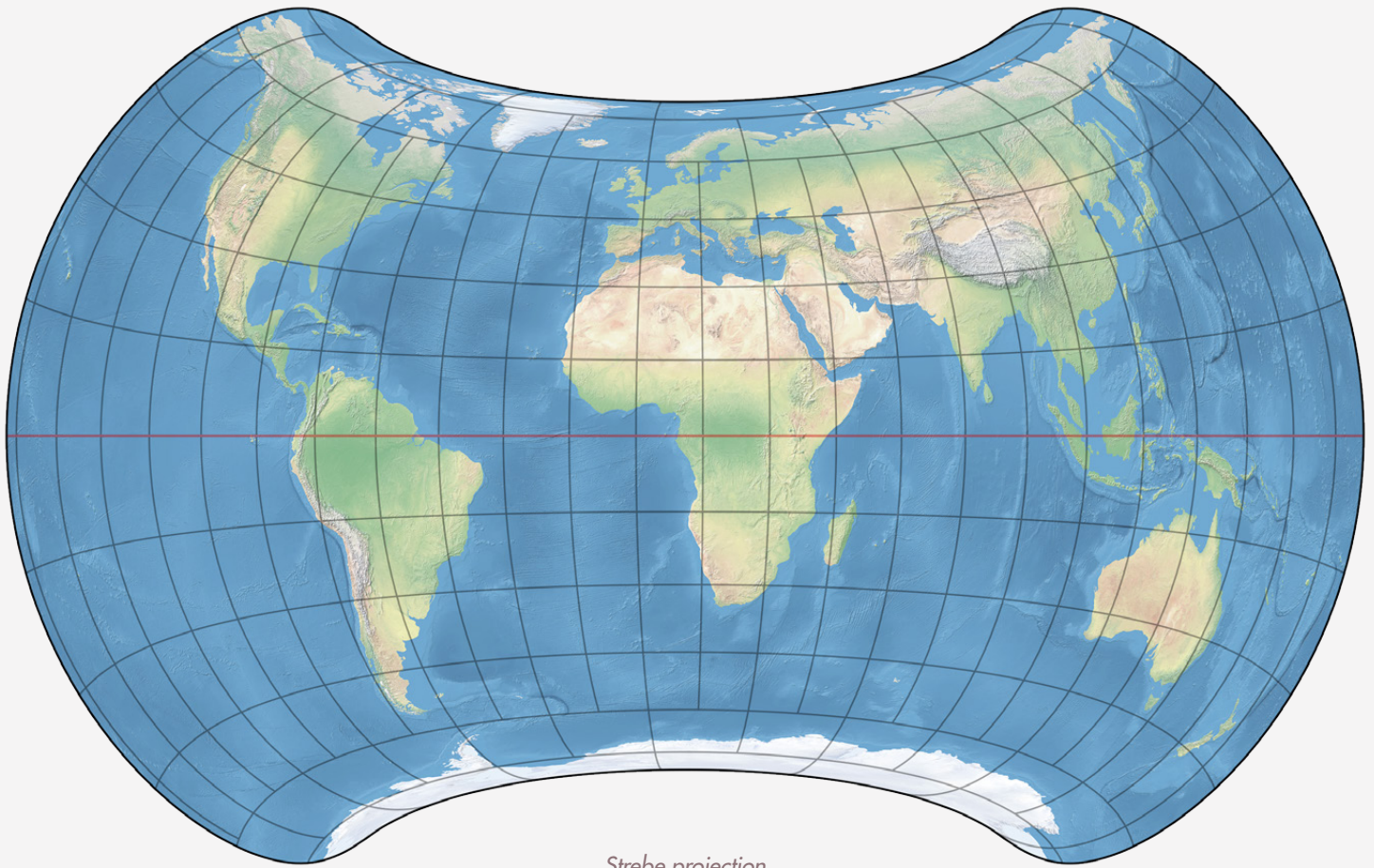
You developed your own map projection, the Strebe. Do any of its properties reflect anything intrinsic or personal about you?

daan

I would like to say no. I'm sure a psychiatrist would think otherwise – there's always some deep constructionism that somebody wants to apply to anything anybody does. But as a matter of fact I've developed a lot of projections, the particular one that you know of has garnered a certain amount of fame. That one is an equal-area projection, and it was designed to be equal area of course, but the other reason it exists is that it is the culmination of those efforts I started back in 1989, because I thought I could do something that I liked better than the Robinson. And the purpose of that projection is to preserve symmetry. It's something that's not supposed to look too horribly unfamiliar, it's not supposed to be sliced up with interruptions, and most importantly



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Strebe projection

the major technique I used was to push the distortion the distortion into the Pacific as much as possible and preserve the shapes of the land areas, while also keeping the map equal area.

Paulo

Do you have a favorite projection, or a least favorite, and why?

daan

I probably have something closer to a least favorite if I thought about it, which I haven't. I don't really dislike any particular projection, and I don't have a favorite either, because a favorite to me means that it must be the best, and if it's the best, that I have to ask: the best for what? And as soon as you start asking "the best for what," then you have to start listing up a bunch of criteria, and those criteria are never going to apply to every circumstance. Obviously, I like the projections that I've developed for various reasons. And the Strebe 1995 projection I like for world maps if you want to do a map with that sort of presentation. But in the end, as far as I'm concerned, people should be exposed to a diversity of projections and a diversity of displays of

those projections, and orientations of those projections, precisely so that they don't develop the kinds of prejudices that Peters, for example, was all about.

Paulo

Do you have a favorite map?

daan

That's an interesting question... No. I would say no, and for almost the same reasons that I don't have a favorite map projection. There are exemplary maps that people have made really interesting and historical statements through. And some of those I deeply respect. Mercator's 1569 map is fabulous. There are other historical maps that are of wonderful design aesthetics that I really enjoy. And frankly when it comes to things like world maps, we really are talking about aesthetics. All of them are going to be so completely distorted in some fashion or another that the choice of the projection becomes not so important unless you are specifically trying to do something like present spatial data that requires preservation of areas, for example. So, it is largely an aesthetic decision. Therefore, if you ask me what my favorite maps are, probably rather than point

to some modern piece of precision I would point to historical maps that have great aesthetic value for me.

Paulo

There are examples out there of bad cartographic analysis on account of people not understanding map projections. Do you think the situation, in general, or in academia, news, or the public, is serious? Do you have any ideas about how to address it?

daan

The situation is not serious for the simple reason that it doesn't crop up often, and when it does, people don't die because of it. We are in an interesting time when a lot of people make maps, who don't know a lot about making maps. Fifty years ago, making maps was an arduous project, and so you didn't generally get a lot of amateurs doing it; the people who did it generally knew a little about what they were doing. So, even though we see misuse of projections, in general people were more or less doing the right thing with their projections. These days we have automated tools for creating maps, and GIS of course has been responsible for a huge proliferation in the misuse of things like the Plate Carrée, or "geographic" coordinate system, things like that, people doing presentations of things that require proper distribution of areas, phenomena based on areas. Or they get on Google Maps and do their mashups using Mercator for those sorts of purposes, without any inkling that they're completely misusing the projection and not portraying at all what they think they're portraying. So I think that the opportunities have proliferated greatly, in the same way that I think desktop publishing came out, when people were all excited about the fact that anybody could be a document publisher. Basically, while it really improved the efficiency of people who were creating documents, it also greatly improved the efficiency of people who were producing garbage.

Paulo

What's the most difficult cartographic project you've undertaken? Any important lessons learned from doing it?

daan

Since I'm not a practicing cartographer that's a particularly interesting question. It does always pertain to map projections itself, and in that sense, I would say it is my ongoing efforts to characterize the conditions for optimality in an equal area projection. And I have not published anything



Daan Strebe (left) and Paulo Raposo (right), meeting for espresso in Toronto.

on that, but I have spent a good 20 years now of mental effort on trying to solve this problem.

Paulo

A little more of a fun question: if you could have an hour with Mercator, or Albers, or Eckert, or Mollweide, or Ptolemy, or whoever your favorite past projection-maker is, who would it be, and what would you talk about?

daan

Okay! I suppose it would be Lambert, Johannes Lambert. He was the person who turned map projections into a science. He applied calculus to the problem of determining how to develop a map based on properties that you wished to preserve. And I would talk to him about everything that he really wanted to talk about, because aside from mathematics he was a brilliant person. He was a Renaissance Man in many ways, he was an expert in all sorts of scientific topics. He has his name attached to things in several branches of science, and while I don't know a lot about him personally other than the biographical details of his life, I have to imagine that he has a keen insight into a lot of topics that I'm interested in.

Paulo

What's the most impressive piece of scholarship you've ever read, in any field?

daan

That would be Newton's *Principia*. I think that that's the most quintessentially scientific piece of writing that I have ever been exposed to.

Paulo

Is it for the essential scientific nature that it impresses you, or the breadth or the depth...?

daan

It's some of that but it's also the fact that he has expressed these ideas in economical ways, and he was always brilliantly insightful in getting to the heart of the matter, whatever the matter was.

Paulo

Very broadly put, what do you see in the future of cartography?

daan

I firmly believe that cartography as an aesthetic practice will endure for a very long time. I don't see that we are going to be able to automate all of it away in the near term. We're not going to be able to automate most of it away in the medium term, and in the long term I'd be a fool to predict anything because for all I know, computer programming and basic science research will be automated away. We simply do not know. It depends on what happens in the fields like artificial intelligence. But the invasion of computers into the craft is only going to deepen, that's obvious, that's clear. A lot of the difficult problems of automated cartography will continue to see revolutionary improvements, and once in a while there will be revolutionary improvements, in things like sophisticated generalization. That's been a huge problem in automating cartography, obviously, and algorithms to do that are going to improve

incrementally, indefinitely. And beyond that, boy, I would consider myself pretentious and probably a fool to predict much more of it.

Paulo

One last question: any favorite NACIS Annual Meeting memories?

daan

(laughs) Let me think about that... By far my fondest memory was the one time I met John Snyder, and that was the first NACIS meeting that I attended. And it was Wilmington, North Carolina, in 1995. Or 1996—somebody's gonna have to check the history of the meetings (*Editor's note: it was 1995*)—but that's where it was and when it was, and it was such a momentous meeting for me, for one thing because it was my first, for another it was my first meeting with so many of the dear folks at NACIS that I see every year now, and finally because it was my first, and tragically last, meeting with John Snyder, who was a complete hero of map projections. We spent a lot of time together. We had corresponded for years back then. In fact I had spent countless hours on the telephone with him from Tokyo, where I was based during the early '90s, discussing analytical ideas on map projections, and finally being able to meet him and to talk about those things in person was cathartic.

Paulo

Thanks for your answers to the questions!