

## News & Announcements

### Ocean Studies Workshop

What do wave anatomy, global warming, marine invertebrates and underwater volcanoes have in common? They're all topics that we will explore at our ocean studies weekend workshop in May.

This workshop blends theory and application, including class time and research. Students will get excited about oceanography, learn a ton, and have fun at the same time.

- ▶ Saturday & Sunday, May 15th, 16th.
- ▶ 9am-4pm (location TBA)
- ▶ Cost: \$120 (materials & light lunch)
- ▶ Open to students in grades 10-12.

### Spring Tutoring

There is still enough time this school year to start tutoring and have a positive impact on understanding. Building real competence in any subject takes time and effort. Please contact us to arrange tutoring soon before our tutors' schedules become booked up.

### STR in the Community

STR runs workshops for middle school and high school level students, parents and teachers.

#### Workshop Topics Include:

- ▶ Study Skills for Parents
- ▶ Study Skills for Students
- ▶ Exam Preparation
- ▶ Memory Techniques
- ▶ Oceanography

If you are interested in hosting a talk by Smart Tutor Referrals, please contact us.

*30-45 minute talks for peer tutors are offered free of charge as a community service to support students, tutors and schools.*

## Cool Things You Can Do with a Science Degree

*This is the first in a series of articles looking at interesting jobs you can get with different university degrees. This month, we've talked with two scientists. Both men offer interesting perspectives on their educational backgrounds, their present work, and advice for students.*

### James Elphick

- ▶ Environmental Scientist, Registered Professional Biologist
- ▶ President, Nautilus Environmental
- ▶ Bachelors of Science in Biology, minor in Environmental Toxicology

#### Educational Background

I went to high school in England. The subjects I majored in were mathematics, biology and economics. I chose these subjects because I liked them and was good at them.

I knew people who were doing economics (an uncle), and all of my family did biology-based jobs (my dad is a doctor; mom is a nurse; and my sister a physiotherapist). So, it also seemed natural to take these courses. What I chose was a bit of an unusual mix because the courses weren't all pure sciences.

At university, I liked some classes, and not others, based on how well the professors taught, and the course content. I found some courses challenging and interesting, but others were mainly memorization. I didn't like chemistry or lab work, but it was something I had to take, although now I like these a lot. Chemistry is the part of my degree I find that I use the most and now I find that it fascinates me. At the time it wasn't something I particularly liked.

I did a co-op program in University which I think was excellent. I'd really recommend it. For one thing, you get help with getting jobs in summer (even if they're maybe not as highly paid as you might hope). And I think what was really useful was getting to do different jobs for four months at a time: just getting to experience what it's like. I worked for a semester at the Department of Fisheries, at the university, and at an environmental consultant company – then I subsequently got hired by that company. I've basically stayed in the field ever since.

#### Present Work

Nautilus is a small business with 12 employees. We have a laboratory. The focus is on evaluating environmental toxicity: measuring if there are effects caused by discharges from industry.

We work mostly for industry: mines and pulp mills, for example. We're hired to evaluate whether or not they're causing environmental effects. We monitor the actual receiving environment on their site, or test effluents or samples from their site, to see if they are safe.

In evaluating contaminated sites, we select samples and then conduct tests with invertebrates like amphipods or polychaetes (ex. tube worms) in the samples, and monitor their growth, survival and reproduction. We then write a report concluding whether the sediment is within acceptable safety standards or if there is an environmental risk.

Sometimes we conduct monitoring projects, like for operating mines, where we measure the fish and invertebrate populations in the environment. We can determine causes of environmental toxicity and they can figure out how to improve it.

We are also involved in risk assessments with existing contaminated sites, which are often in marine ports. Here we do studies to investigate the risk of existing contamination. We help with decision-making on the degree of risk (how biologically significant the contaminant is) and suggest possibly removing the contaminated mud or capping it with clean sediment.

Basically we assess environmental risks and how to deal with contamination, helping to prioritize efforts and to make the world a cleaner place. Here chemistry and biology intersect.

I use a fair bit of what I learned in school and refer to my old textbooks occasionally. My university studies help me to know where to look for things and to be able to, fairly quickly, understand a process, set a methodology and analyze results.

#### Advice for Students

You don't really know, until you try something, whether you're well-suited for it. Personally, I didn't like lab work in university, now I like it most.

## About Us

We provide **1-on-1, in-home tutorial support** throughout Victoria, Saanich and Sooke.

STR was established in Victoria, BC in 2002 and has built a solid reputation for creativity and professionalism.

**With over 50 tutors**, we are able to find the best match for each student. Our tutors are certified teachers and professionals. They are carefully screened and chosen specially to match the needs and learning styles of each student.

**Our goal is** to enhance students' skills and to cultivate learning confidence through support that is truly individualized: matched specifically to each student's needs, recognizing each student's unique talents and abilities.

*We support families in education.*

For more information and resources, visit us on-line at:

[www.SmartTutorReferrals.com](http://www.SmartTutorReferrals.com)

## Contact Us

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Be open to learning new things. Recognize what motivates you (in anything you're doing), what challenges you, and find a career that makes use of that.

Ultimately you want to be doing something that motivates you and that you get some positive response from so you'll actually enjoy it and feel that you're learning from it.

I just love getting data that leads to an understanding of the relationships between things. Seeing results and coming to an understanding, that 'eureka' moment, is something that I really enjoy and get a lot from. It happens enough in my work that it keeps me interested in what I'm doing.

### Bodo de Lange Boom

- ▶ Engineering Project Supervisor, Canadian Hydrographic Service
- ▶ Masters of Science in Physics, specializing in Oceanography

### Educational Background

I didn't take a linear path, but I've always been interested in science. Actually, when I was in high school I never would have guessed I'd end up doing what I'm doing today.

In high school I took the 'technical program'. In addition to academic courses, it covered things like: drafting, electricity, electronics, automotive, machine shop, sheet metal, etc. It was like trades training, but oriented toward students going on to college or university, to give them a background in these various topics.

While in high school I became interested in astronomy, so when I went to university, I started out studying astronomy. After my first year, I got a summer job at the Nanaimo Biological Station working for a physical oceanographer. As a result I developed an interest in oceanography. I continued with astronomy, but chose my courses to give me the flexibility to switch degrees. In my fourth year, I switched to physics and completed my degree in physics.

I went directly into a masters program after my BSc. As I was finishing my master's thesis, I took a job with the Beaufort Sea Project. I was hired to work on physical oceanography in the Beaufort Sea: doing things like measuring currents, water properties (like temperature and salinity as a function of depth) and studying ice motion.

The work I did on the Beaufort Sea Project was fairly practical, hands-on sort of work. So both the university training for the oceanography aspect but also the hands-on type of skills I learned in high school came in very useful in

terms of preparing equipment for the Arctic survey work. My outdoors experience came in handy when we were working out of camps in the Arctic (whether camped on the ice or on land).

Through the projects I did then and later, I worked on all of Canada's coasts, even quite a bit of Arctic work – so it was all quite interesting.

### Present Work

Now the area I focus on is hydrographic data management. Working for the Canadian Hydrographic Service, we're responsible for providing the navigation charts for Canada, the tide and current tables, and publications like the Sailing Directions. All kinds of vessels and boats, including submarines use the charts.

My work is related to oceanography but it's not directly oceanography. While there's an overlap, most of the people who are working this field have a background in geomatics (i.e. measuring the earth), geography or surveying.

Our focus is primarily on mapping the ocean. Although above-surface features are important to help mariners safely navigate (things like lights, buoys, heights of land, that sort of thing), just as important is the under-water portion: where the water is shallow, where the safe navigation channels are, what the water is doing, what the tide level is. A rock that might be perfectly safe to cross over at high tide may be exposed at low tide.

More and more the people using our data are not navigators – they might be scientists doing research, engineers doing either on-shore or off-shore construction projects. An example is for alternate electricity generation projects that use tidal or wave energy.

Our data are also being used for computer modeling: simulating tides and currents or tsunami propagation and run up. Particularly for tsunami modeling, the water depth needs to be known in quite a lot of detail.

### Advice for Students

Follow your interests and passion. That certainly has worked very well for me. When I first went to university, it was suggested I go into chemistry, which did not interest me as much. I'm glad I stuck with astronomy at the start and later followed my interest in oceanography.

Also, learn as much as you can both academically and practically. That's something that has stood me in good stead both in terms of the hands-on experience I gained in shop courses I took in high school and later in summer jobs when I got involved in computer programming. Getting wide experience is important because jobs do change, as might a person's own interests. This gives much more flexibility in terms of what you can do.