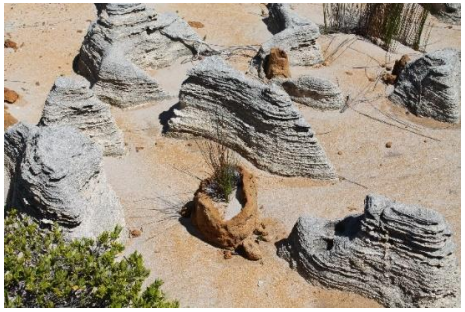
Science Rocks
Career Expo 2020
ONLINE
STUDY GUIDE

geology
science communications

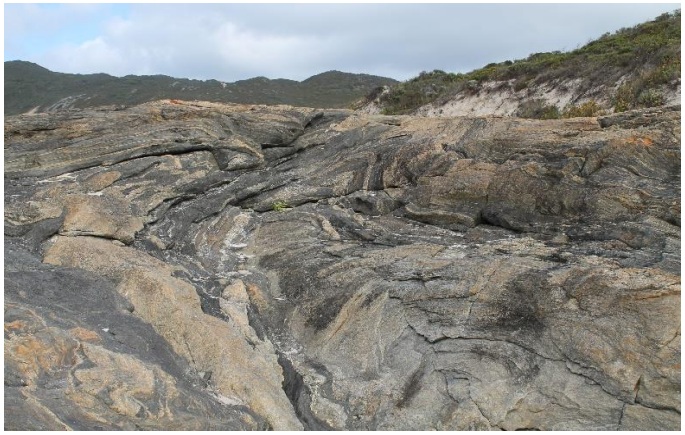
Great Southern Science Council Pro Files series – connecting science professionals and our community

Associate Professor Katy Evans

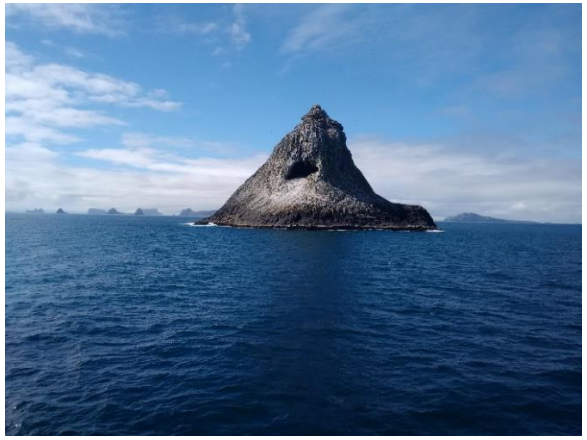
job title	**Associate Professor, Curtin University**
organisation	Curtin University https://research.curtin.edu.au/supervisor/dr-katy-evans/
where and contacts	Lives much of the time close to Albany when not working at Curtin Perth Campus; k.evans@curtin.edu.au
Pro File video interview	Watch the Pro File video *Katy Evans - Geologists learn Earth's story through rocks* to learn more about this STEM professional, why they chose to work in this field and their pathway to it, their typical work day, favourite part of the job, common myths about their field, and more.



Fossil tree trunk in limestone on the Nullaki Peninsula, near Youngs Siding. The weird patterns record weathering and dissolution by wind and rain.



Refolded fold at Hillier Bay, 20 km west of Denmark. This shows what rocks look like after they have been folded and then folded again.



Pyramid Island, a volcanic plug in the Southern Ocean. The hole is full of nesting albatross.

EXTENSION MATERIAL – science professionals answered these questions to extend your interest and study in their topic area

FREQUENTLY ASKED QUESTIONS in this topic/job	**FAQ 1** Geology, is that studying dead people?	No, geology is an earth science, and is the study of the rocks and minerals that make the Earth, and the processes that change them over time. Archaeology is the study of people and culture by finding and analysing material culture, and this may include studying mineralised cultural artefacts, and could overlap with palaeontology (study of fossils) when remains of life are found in solidified sediment deposits. Anthropology is the study of humans and social/cultural behaviour, and a branch called physical (aka biological) anthropology may include studying human remains to understand human evolution.
	FAQ 2 Is this (rocklike object) a meteorite?	No probably not. Meteorites are very rare, but if you think you have found one, check out these clues to 'meteorite or meteorwrong". https://www.wikihow.com/Tell-if-the-Rock-You-Found-Might-Be-a-Meteorite and www.youtube.com/watch?v=ClW3EB8Ptuw If it passes all the tests then you might have found a meteorite. The space scientists at Curtin would be interested to hear from you.
	FAQ 3 Do you work for a mining company?	No, but I teach the people who do.
YOUR TURN	What question could you ask this person?	
LEARN MORE	Katy recommends these sources for new geological findings:	There are a few newsletters that report new geoscience research in plain language, check out http://gsa.junctionworld.com/geoz/geoz209/geoz209.html and https://www.geochemsoc.org/publications/geochemicalnews Nature Geoscience has cutting edge research, but the language tends to be more technical. www.nature.com/ngeo
	Katy suggests this website:	http://www.travelinggeologist.com/ has some fantastic stories about geologists in cool places.

DO MORE	A citizen science or interactive project that community can be involved in to learn more about this topic	Not really aware of any, but if you want to learn about the local geology then check out the Museum of the Great Southern and partners, who sometimes have geological talks. Watch for events during August for National Science Week in the Great Southern.
INNOVATE One, Two, Three…solved!	**One** Big Problem we are trying to understand in this topic area **Two** innovative ways we are already trying to solve the problem **THREE** ideas for the problem solving wishlist that anyone could help develop	**1** We need to understand how nickel deposits form to help us find them, because nickel is an important battery metal, and demand for batteries is growing as we move towards renewable energy sources. If we can understand how sulphur from the Earth's crust is included in those deposits then it helps us to understand where nickel deposits form. I'm working on this in the Fraser Zone, a few 100 km to the northeast of Albany. **2.1** We use sulphur isotopes to track the source of the sulphur, so we can see if it comes from deep in Earth's crust, or from sedimentary rocks closer to the surface. We can also use these to recognise the signature of sulphur from really ancient rocks, more than 2.3 billion years old, which is half the age of the Earth. **2.2** We also use a novel combination of sulphur isotopes, which track the local sources of sulphur with hafnium isotopes, which record the ancient structures that lie beneath the area, to understand the interactions between surface and deep processes, and contemporary and ancient structures. **3** If you want to join in then get a geology degree, specialise in geochemistry and come and do a PhD!
YOUR TURN	Using your new insights for this topic and its issues, please add another idea for the Problem Solving Wishlist. Then think of a research question to test possible solutions.	

# CURRICULUM LINKS #	**# Year 9: The theory of plate tectonics explains global patterns of geological activity and continental movement #** Check out this movie of the break-up of Gondwana, an ancient supercontinent. https://www.youtube.com/watch?v=HyEq3RWKklM Watch India and its collision to form the Himalayas. The same software, developed by some of Katy's friends and colleagues at the University of Sydney, was used to make the animation of the plate tectonics that formed Westeros and Essos, the fictitious continents in *Game of Thrones** https://theconversation.com/we-made-a-moving-tectonic-map-of-the-game-of-thrones-landscape-117393 **age- appropriate viewer discretion may apply to some television show and video game content*
INFLUENTIAL GEOLOGISTS	Did you know that plate tectonics was a controversial theory as recently as the 1950s? Do some research to discover some of the reasons that people did not believe in plate tectonics. How did scientists who believed in plate tectonics argue against these reasons?
WOMEN IN GEOLOGY	Mary Anning was an early palaeontologist, which is a geologist who specialises in fossils, and one of her many achievements was the first discovery and description of a plesiosaur. Yet she was less well known than many male geologists who made less important discoveries. Use your research skills to investigate the times in which she lived, and discuss some of the reasons that she was comparatively unknown.
KNOWLEDGE + IMAGINATION What would it be like?	Name and describe two ways that everyday life would be different without geologists. If you are stuck then think about the mineral resources that we use every day. **1** **2**
OUR PATCH GEOLOGY IN THE GREAT SOUTHERN	Check out Katy's Study Guide photos (page 1) and research the formations and locations described for sites on the Nullakai Peninsula near Young Siding, west of Albany, and Hillier Bay, west of Denmark, Western Australia. Then, learn about the Torndirrup National Park to explore significant geological formations and cultural heritage within 20 km of Albany, WA.