Our Member Spotlight is off to Perth to meet **Mark Duffett**. Mark is a Senior Geophysicist with Mineral Resources Tasmania, in the section sometimes known as the Tasmanian Geological Survey. Mark has been a geophysicist for 27 years (24 if you don’t count the time he took a bit of a detour into GIS and remote sensing).

1. **What do you like most about being a geophysicist?**

   The best of all worlds - numbers, maps and being in the field. Also the 'exploration' part of *exploration geophysics*, inferring things concealed or discovering entirely new things about the planet.

2. **If you weren't a geophysicist what would you be?**

   Meteorologist or journalist.

Mark Duffett and his gravity buddy out in the Tasmanian countryside in 2019. Photo - Mark Duffett

3. **What is your best interview tip?**

   Make sure you listen really carefully to the entirety of the questions. Prematurely fixing on your answer to just one aspect and forgetting about the rest, or even worse, misconstruing it, can be a trap. Don’t be afraid to ask for

a repeat of the question if you become unsure partway through your response to a complex multi-parter.

4. **What's one thing that we wouldn't know about you?**

   I've been an Australian Rules football umpire (boundary, goal and field) for even longer than I've been a geophysicist. I think I may hold some sort of record for being the only person to have umpired on both the northernmost and southernmost proper footy grounds in Australia - Stanley Tipiloura Oval in the Tiwi Islands and Kermandie Oval near Geeveston.

5. **Tell us about your best field meal?**

   The Breaker Burger at the Cape Crawford roadhouse aka Heartbreak Hotel in the NT. I have unsophisticated tastes.

6. **Where was your best sunrise/sunset location?**

   The view looking west towards the Georgina Basin from the Lady Loretta field base ridge would regularly throw up some corker sunsets.

7. **What are you reading at the moment?**

   Apocalyptic Good News: Christ in the Cosmos by theologian and former French Petroleum/CGG geophysicist R. Dean Drayton, and Jo Walton's What Makes This Book So Great: Re-Reading the Classics of Science Fiction & Fantasy.

8. **What made you decide to be a geophysicist?**

   See above under 'What do you like most about being a geophysicist'. Numbers, maps and measurement. Using physics to do geology seemed the perfect meld of interests.

9. **What's one thing you wish someone had told you when you were at university?**

   Don't have quite so much fun in first year.

10. **What's your most treasured textbook?**

Not really a recognised textbook, but David Leaman's CODES Master of Economic Geology short course manual – *Exploration Geophysics*, Remote Sensing and Image Processing Part 1 - ended up being the single most useful volume to me, much annotated. Highly practical distilled wisdom for sound potential field practice (especially in those pre-differential GNSS days when microbarometers had to be relied on for height determination) on every line.

11. **Your funniest or worst field memory?**

    During a stint operating on my own out of the base at Lady Loretta, at that time on care and maintenance, I had to refuel my vehicle with diesel manually from drums. No matter how careful, my clothes would then reek of the stuff for days, even after washing. So I resorted to wearing nothing but a pair of thongs for refuelling. Crude but effective.

12. **Your most respected geophysicist?**

    Michael Roach. Extremely capable, and generous with his time.

13. **What do you do in your spare time?**

    Eclectic reading, walking, and non-lycra cycling, the latter a bit more sedately these days on my new e-bike. Very occasionally I write for The Footy Almanac. I also succumb to the temptation of Twitter too often (@MarkDuffett), where I indulge my interests in football (Central District in the SANFL, Adelaide in the AFL), cricket, and low carbon energy. And geoscience, of course.

14. **What is a challenge you have overcome and how did you do so?**

    In 1997 I was tasked with conducting a gravity survey in the McArthur Basin, solo except for the assistance of a helicopter + pilot for a few days. Coming to grips with both a brand new digital gravity meter and differential GPS gear in short order was challenging, especially when on returning in the evening it turned out the base had decided to shut down in the middle of the day. The manual proudly advertised the North American receiver's ability to function in temperatures down to -30, but midday insolation in November near the Gulf of Carpentaria…not so much, it appeared. Contriving a well ventilated and shaded platform for the receiver from scrounged materials (a couple of 44-

gallon drums, bricks, a milk crate and a galvanised iron sheet) proved mostly sufficient to nurse it through.

15. **What is a challenge that you see in geoscience today, and how do you see the community overcoming it?**

    The serious misperceptions of our science and the industries utilising it that exist among students and educators, which I believe is having a major impact on recruitment to geoscience. Ignorance is most prevalent, but outright hostility is also not uncommon. A good step towards overcoming this is for practitioners to be alert and prepared for opportunities to talk about what they do e.g. with local schools and elsewhere in the community.

16. **What reaction do you mostly get when you tell someone that you are a geophysicist?**

    A what?

17. **When you are asked "What's a geophysicist??" or "What does a geophysicist do?" what is your stock answer?**

    "You know, like on Time Team". We use physics to do geology in three dimensions.

1997 - Mark taking a gravity reading in the NT with a background of Bukalara Sandstone. Photo - Mark Duffett

18. **What is the best way that the ASEG could let the public know about geophysics and its benefit to the everyday life?**

    Keep plugging away at social media. Never miss an opportunity to highlight the links between *exploration geophysics* and the resources that are needed to build a better world. Not just as ASEG, but by empowering all members to bring their informed perspective to these issues in public and educational arenas. Continue to be open to supporting and collaborating with organisations like the Minerals Council, APPEA etc. on initiatives to address misperceptions in schools etc.

19. **Where do you think exploration geophysics will head in the next 10-15 years?**

    Development of semi- and fully autonomous drones for data acquisition, regulation and research sector capability permitting. More effective, rigorous and easier synthesis of information from multiple techniques and data sources across the whole gamut of geoscience, coupled with better understanding of

mineral systems. Machine learning will play a role, but so will better human understanding.

20. **Given a choice, would you prefer extra mentoring on the science, your career or the how to handle/explain exploration geophysics and its benefits to the community?**

    I guess over time there's a tendency to migrate from the former to the latter, but I'd really like both!

21. **What aspect of geophysics do you enjoy most?**

    Seeing new data.

22. **Do you think AI will take over your job or will the human element remain vital to exploration successes?**

    I don't see the machines taking over in my lifetime, at least not my working one. Data-driven AI approaches will provide some marginal or incremental successes, but until we can model 4D geology to the level of being able to see why ore-forming processes occur exactly where they do, I can't see the much-sought step change in exploration success happening. A diversity of human intuitions will continue to be needed. There's a line in one of Arthur C. Clarke's writings, itself set centuries in the future, along the lines of "unlike chemistry, it would be centuries before earth science was a closed, surprise-free subject". I reckon he got that about right, as he did much else.

    But then again I used to think airborne gravity would always be impractical, so make of that what you will.

Mark cradling his CG3 baby in an R22 helicopter the McArthur Basin, NT.
Photo - Mark Duffett