

UniSA TechNET 2016

Challenges of operating an Analytical Facilities in a University Setting

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EAL Background

- EAL is an independent University - research, teaching and commercial analytical laboratory.
- Founded around 1992 as self funded analytical facility – now 30 staff, \$3.5M/yr.
- NATA and ASPAC quality assurances.
- Large range of services (water, soil, leaf, compost, hair, fertiliser, etc) - ‘State of the Art’ equipment.
- Clients – Govt Depts, Consultants, Unis,

Details

- Southern Cross University – Small Uni 8K students - Lismore Northern NSW near Byron Bay (Campuses Gold Coast and Coffs Hbr)
- Why does EAL exist at SCU?
- ERA 2015 rankings!
- **9 x 'Well above world standard' (ERA rating 5)**
- **9 x Above world standard' (ERA rating of 4)**

'Well above world standard' (ERA rating of 5)

- Geochemistry (0402)
- Oceanography (0405)
- Environmental Science and Management (0502)
- Zoology (0608)
- Agricultural and Veterinary Sciences (07)
- Crop and Pasture Production (0703)
- Forestry Sciences (0705)
- Complementary and Alternative Medicine (1104)
- Nursing (1110)



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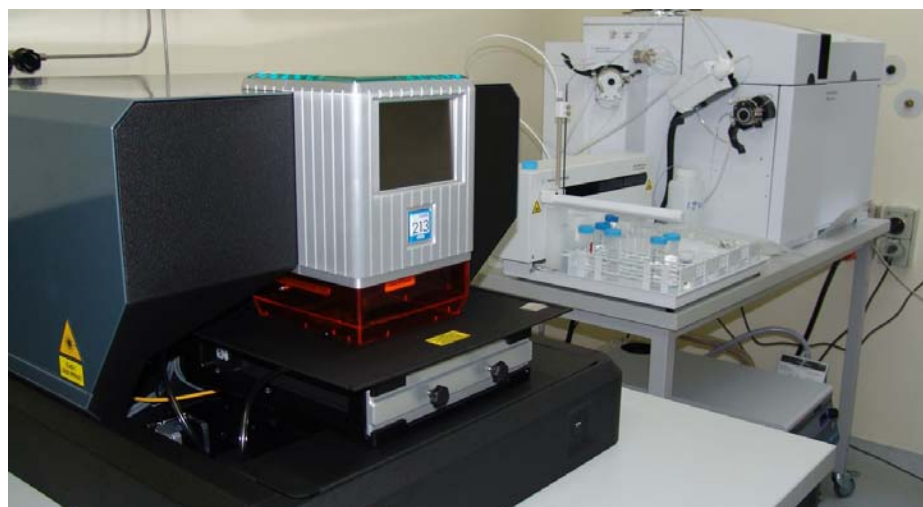
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History in SCU

- EAL started as 1 and currently has 30 staff
- Directly maintains over \$3M of instrumentation but access to another \$10M instruments and facilities
- Taming frustration... SCU bias directed to research spending with minimal justification...
- Don't expect hierarchical top down feedback.... Best if no interference in operation.
- Cash cow concept! Impossible goals. Budget challenges and CHANGES.... Zero starting \$

Analytical Chemistry- pH/EC, LECO, FIA, Laser!



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ICPOES and ICPMS Analytical Chemistry



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Analytical Chemistry at SCU!



2.

EAL expected LORs using seaFAST

1/08/14

PARAMETER	Seawater	Water (Fresh)	Seawater	Water (Fresh)
	Routine analysis		Ultra-Trace analysis	
	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)
SILVER	<1	<1	<0.05	<0.05
ALUMINIUM	<5	<5	<1	<1
ARSENIC	<1	<1	<1	<0.5
CADMIUM	<1	<1	<0.02	<0.02
CHROMIUM	<1	<1	<0.5	<0.5
COPPER	<1	<1	<0.05	<0.05
IRON	<5	<5	<0.05	<0.05
MANGANESE	<1	<1	<0.05	<0.05
NICKEL	<1	<1	<0.1	<0.1
LEAD	<1	<1	<0.01	<0.01
SELENIUM	<1	<1	<1	<1
ZINC	<5	<5	<0.5	<0.5
MERCURY	<0.5	<0.5	<0.1	<0.1
VANADIUM	<1	<1	<0.1	<0.1
COBALT	<1	<1	<0.05	<0.05
MOLYBDENUM	<1	<1	<0.1	<0.1
BARIUM	<1	<1	<0.2	<0.2
THALLIUM	<1	<1	<0.05	<0.05
BISMUTH	<1	<1	<0.05	<0.05
URANIUM	<1	<1	<0.01	<0.01

* Note: data not validated using seaFAST. The values are expected LORs.

ICPMS – with SeaFAST ultratrace analysis

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Analytical Chemistry- HPLC ICPMS, SEM-EDAX!



This year \$300,000 LIEF Grant



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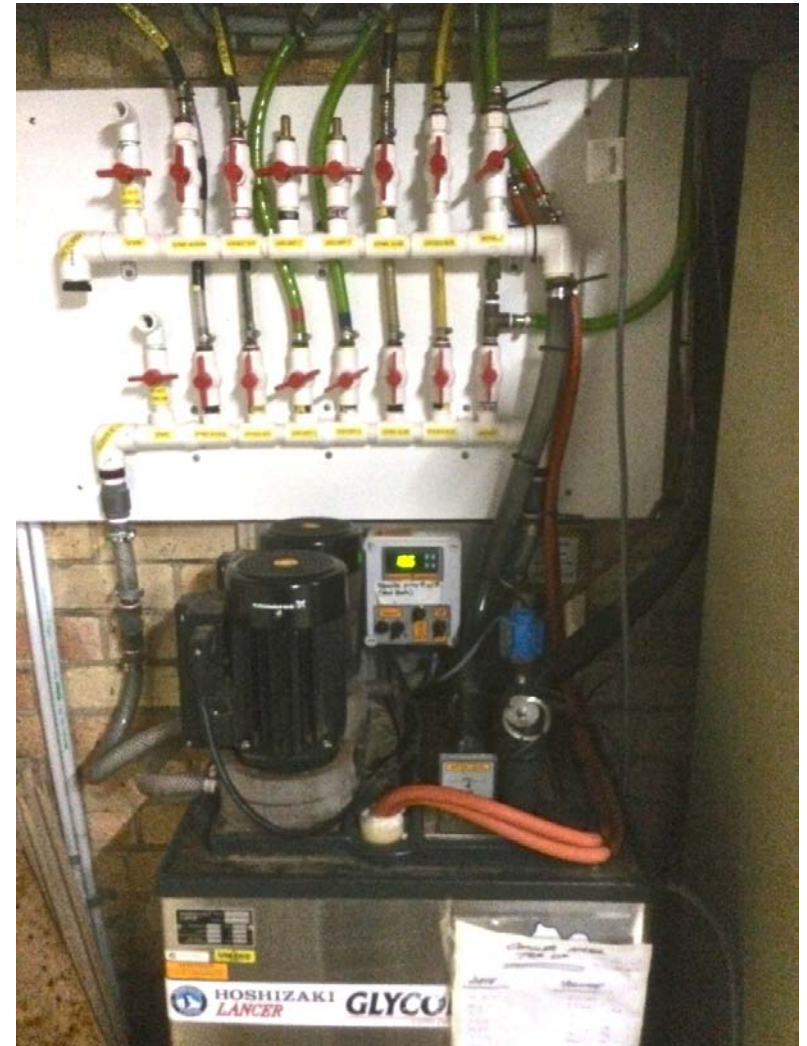
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Innovation at SCU



6 place Chromium Reducible Sulfur
Analysers



'Glycol Bath'
Recirculating Chiller
System

Analytical Chemistry- Ovens and Gas!



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Professional Staffing

- Staff – requires careful selection and ability to trial, review, reward, remove, retire, etc.
- Dedication eg., commitment, training, trainees, on-the-job training,.. Trainees great with Cert3, Cert4 through to Diploma (get very bright Year 10 – Year 12 leavers starting gross cost about \$500 per wk – 35hr work with on-the-job training - 3hr onsite Tafe/wk)
- All EAL staff are Professional Staff (ie. technical, admin...) in the HEW system but not a good fit in many cases.
- Bonus system currently impossible –eg. failed
- EAL offers flexibility and long term job security but comes with work expectations (ie. if poor performance then no job or no EAL)

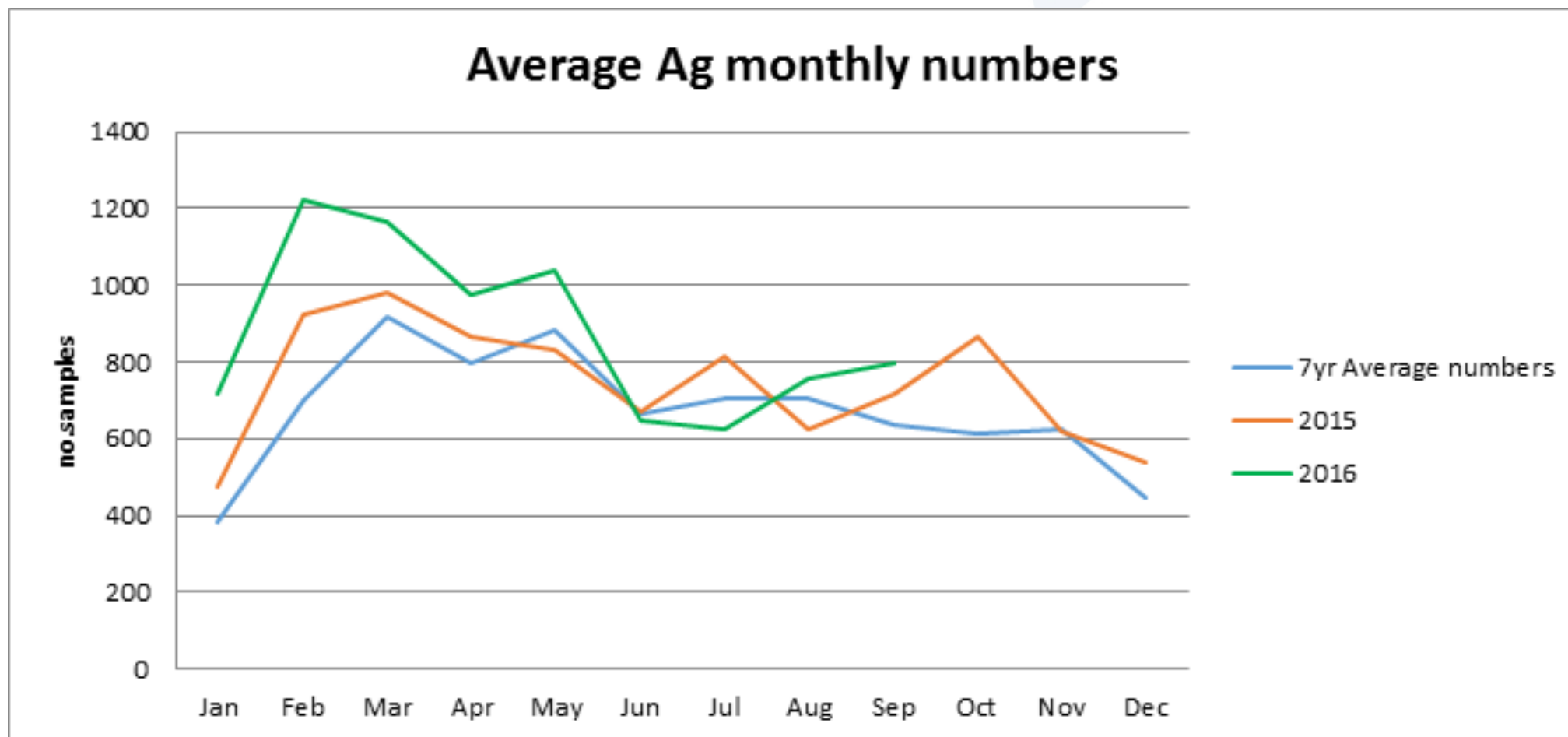
Requirements for success

- Flexibility and diversification – sections, environmental waters/ effluents, agricultural soils and plants, composts, mulches and potting mixes, contamination assessment, acid sulfate soils/ rocks, hair analysis, etc.
- Niche – identifying, acting, execution (ie. Biological Farming, health hair analysis,..)
- Automation, innovation, expectation, accountability
- Country location so free courier Australia wide

Commercial – Benefits to a Uni

- Research – develop new techniques
- Quality – always room to improve but note NATA does not guarantee quality just procedure....
- One-stop-shop (ie. all services)
- Quick TAT, reasonable pricing, service reliability all year round
- Instrument training- multiple staff trained in operation, service, repair
- Flexibility, diversification, Instruments, automation

Monitoring Ag Soils



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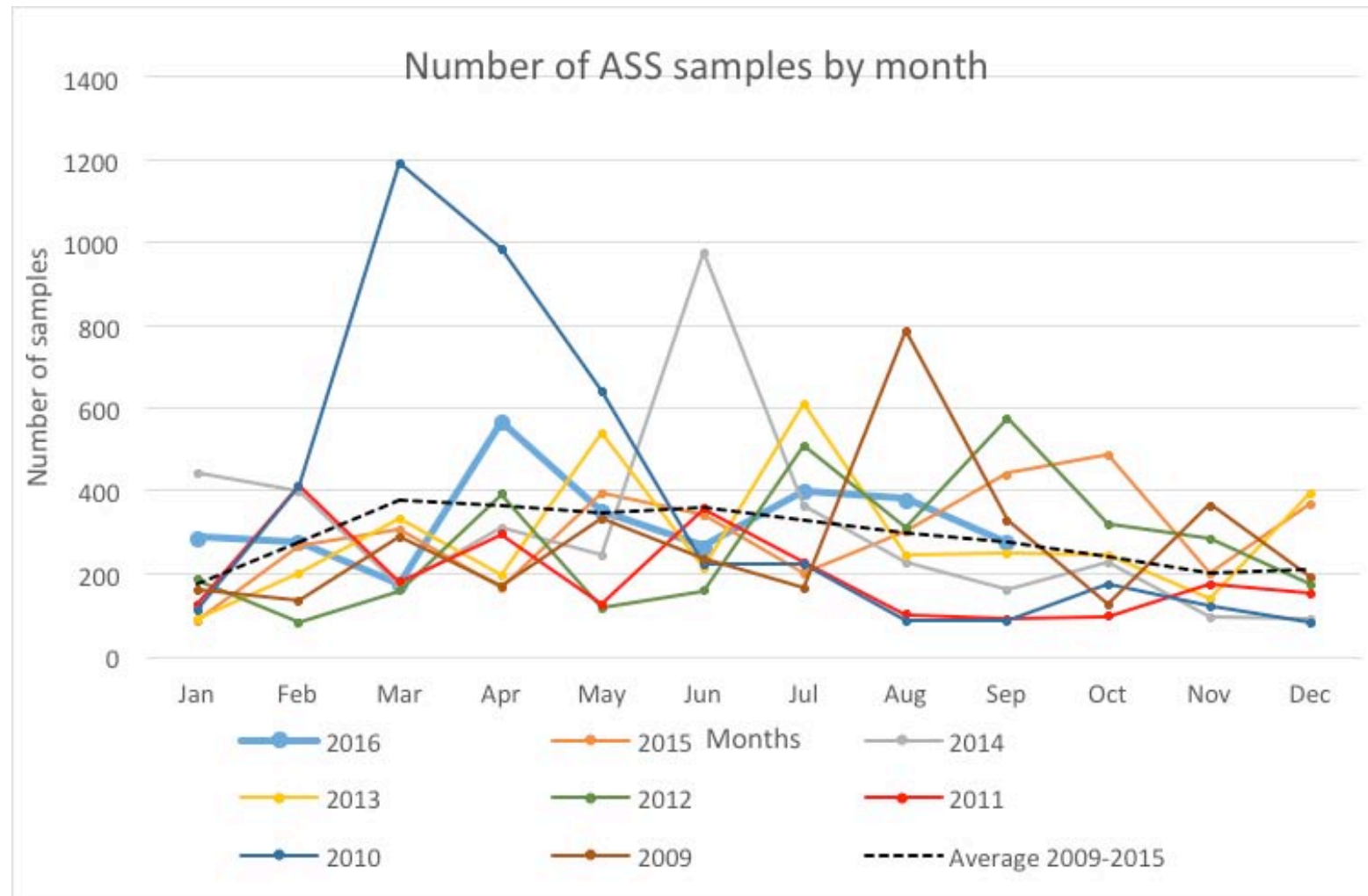
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Monitoring Acid Sulfate



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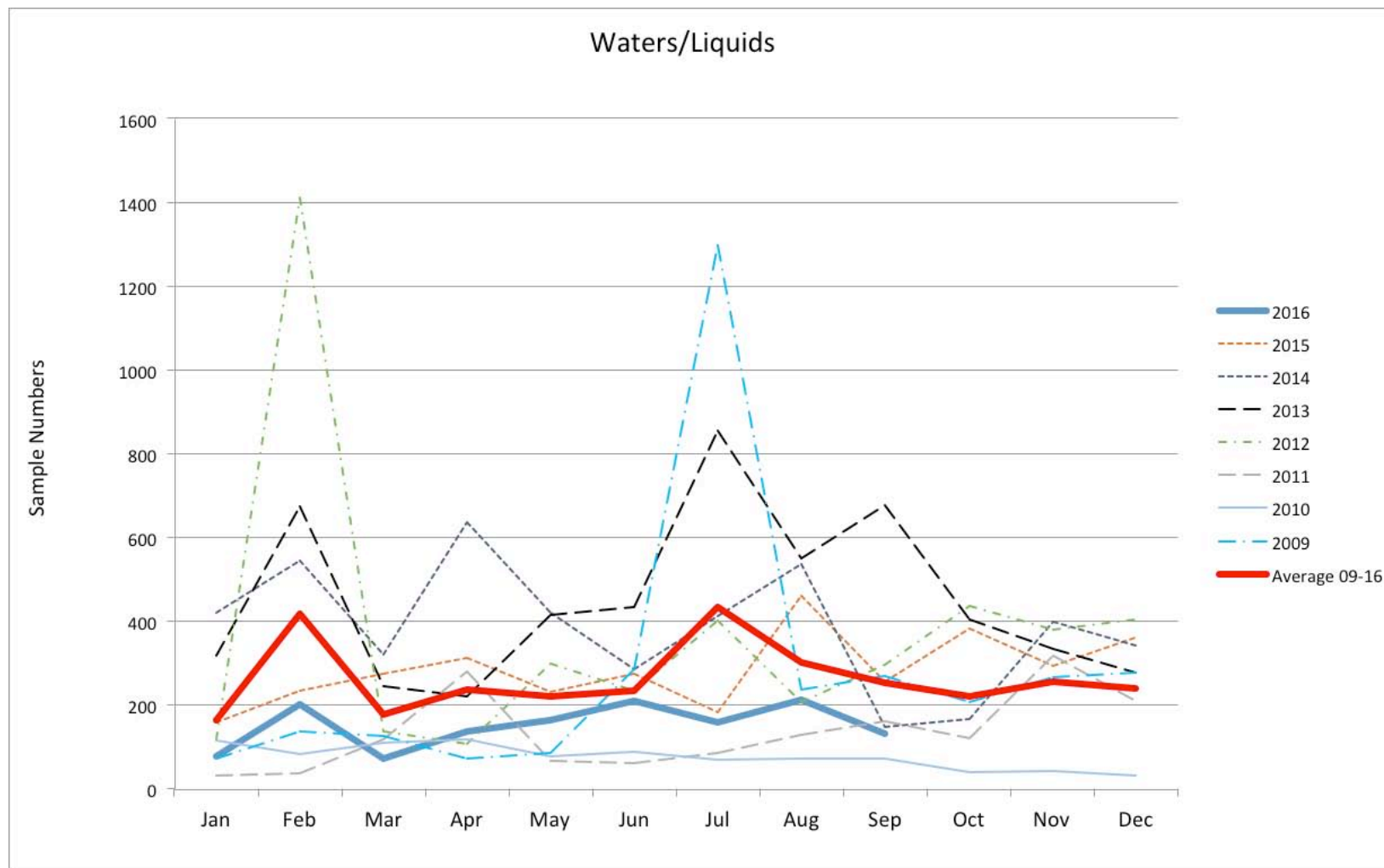
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Monitoring Waters ICPMS



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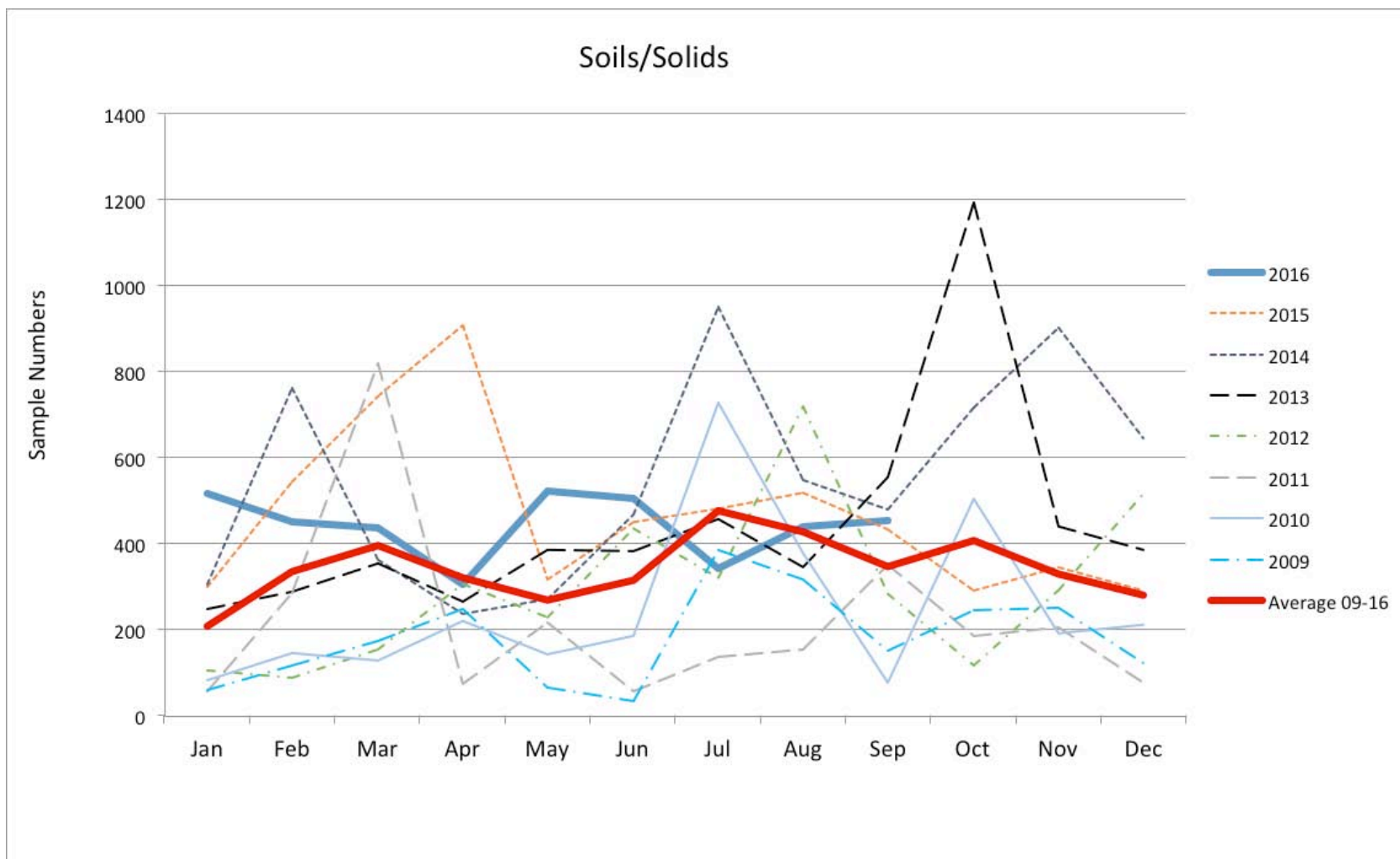
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Monitoring Solids ICPMS



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Challenges

- Surviving boom and bust model.... Over 20 years Ive seen hundreds of clients go bust... over/under capitalise
- Ridiculous internal financial arguments... budget tight so don't pay suppliers.
- In 2012 had an 'EAL Consultancy Services' section – section/ staff terminated...
- Any indication that a section of a University poses any 'safety' or 'poor PR' threat has potential for closure
- Fight for internal political survival.....

EAL Report Card- Resume

- What EAL provides the Uni:
- FULL cost recovery... all staffing and operating costs
- All EAL instrumentation - Internal loans/ compete
- Subsidisation of research and teaching in the order of \$0.5M /year
- Financial return of around \$0.7-0.9M/year to SCU
- 5-10% business growth every year BUT is this all sufficient justification for survival?

Conclusion...

- Extremely challenging in a University system and structure
- Some autonomy in mgt essential without academics
- Model allows potential to utilise, maintain and provide operating costs for under-utilised instrumentation
- Commercial also a curse.... bled dry.
- Academics aren't always the best managers of staff or budgets.... Need practicality

Conclusion...cont'

- EAL vision statement:
'To operate as a world-class analytical laboratory supporting research and teaching funded by commercial activities'.
- Since 1992 – a conservative estimate of EAL support to SCU is:
 - \$25M of external commercial income
 - \$10M of ARC project support
 - \$5M internal student support
 - \$5M internal staff support....

QUESTIONS!!

- Tours and visits always welcome

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