Exploration trends, finds and issues in Australia

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Overview

For the first time, the analysis includes **Bulk Mineral** discoveries

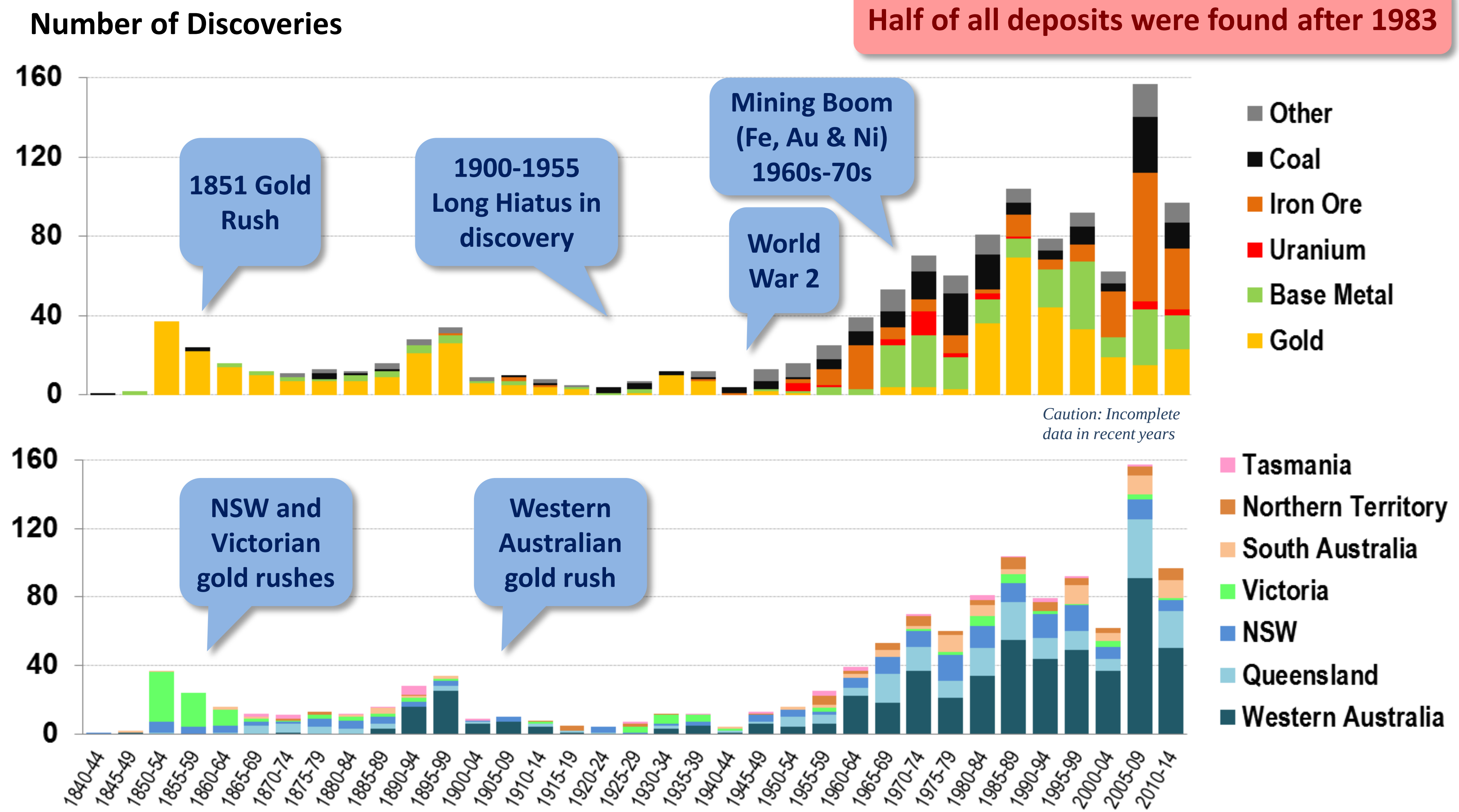
1. Two Centuries of discovery in Australia
2. Trends in exploration spend (1975-2014)
3. Location of discoveries made
4. Number of discoveries made
5. Increasing depth of discovery
6. Quality and value of the discoveries made
7. Who made the discoveries ?
8. Financial challenges facing Junior Explorers
9. Summary / Conclusions

There have been several waves of exploration success in Australia since mining first started in the early 1800s

1. TWO CENTURIES OF DISCOVERY IN AUSTRALIA

No. of significant mineral discoveries in Australia: 1840-2014

Half of all deposits were found after 1983



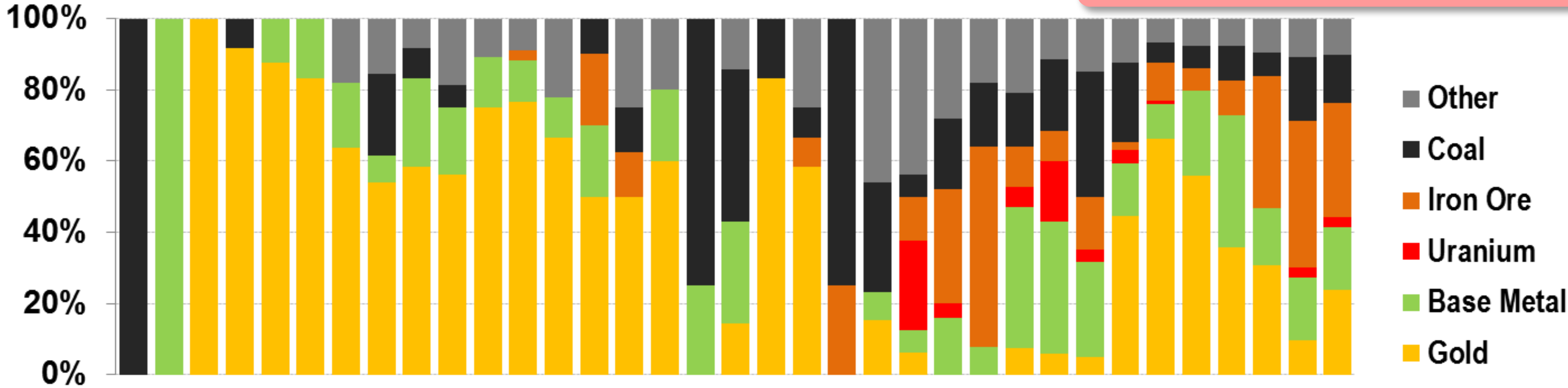
Note: Based on 1225 discoveries >= "Moderate" in size, i.e. >0.1 Moz Au, >5 kt U_3O_8, >10 kt Ni, >0.25 Mt Zn+Pb, >0.1 Mt Cu-equiv >20 Mt Thermal Coal, >10 Mt Coking Coal, >10 Mt Fe, >10 Mt Al_2O_3
Excludes 414 deposits without a discovery date. Excludes satellite deposits within existing camps

Source: MinEx Consulting © November 2015

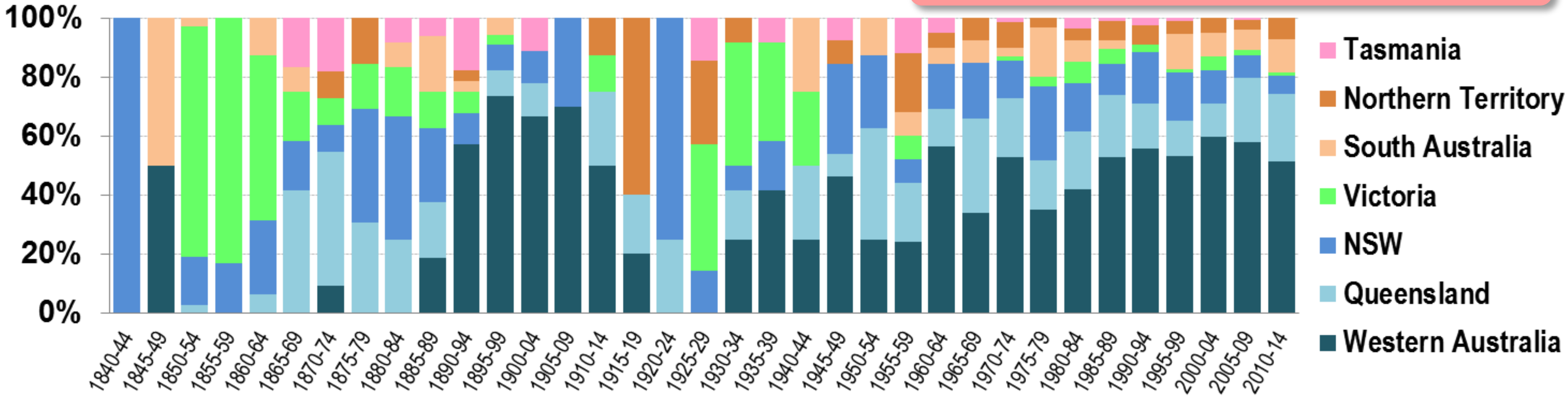
Significant mineral discoveries in Australia: 1840-2014

Percentage Breakdown

Gold is the main target



Western Australia is the main destination



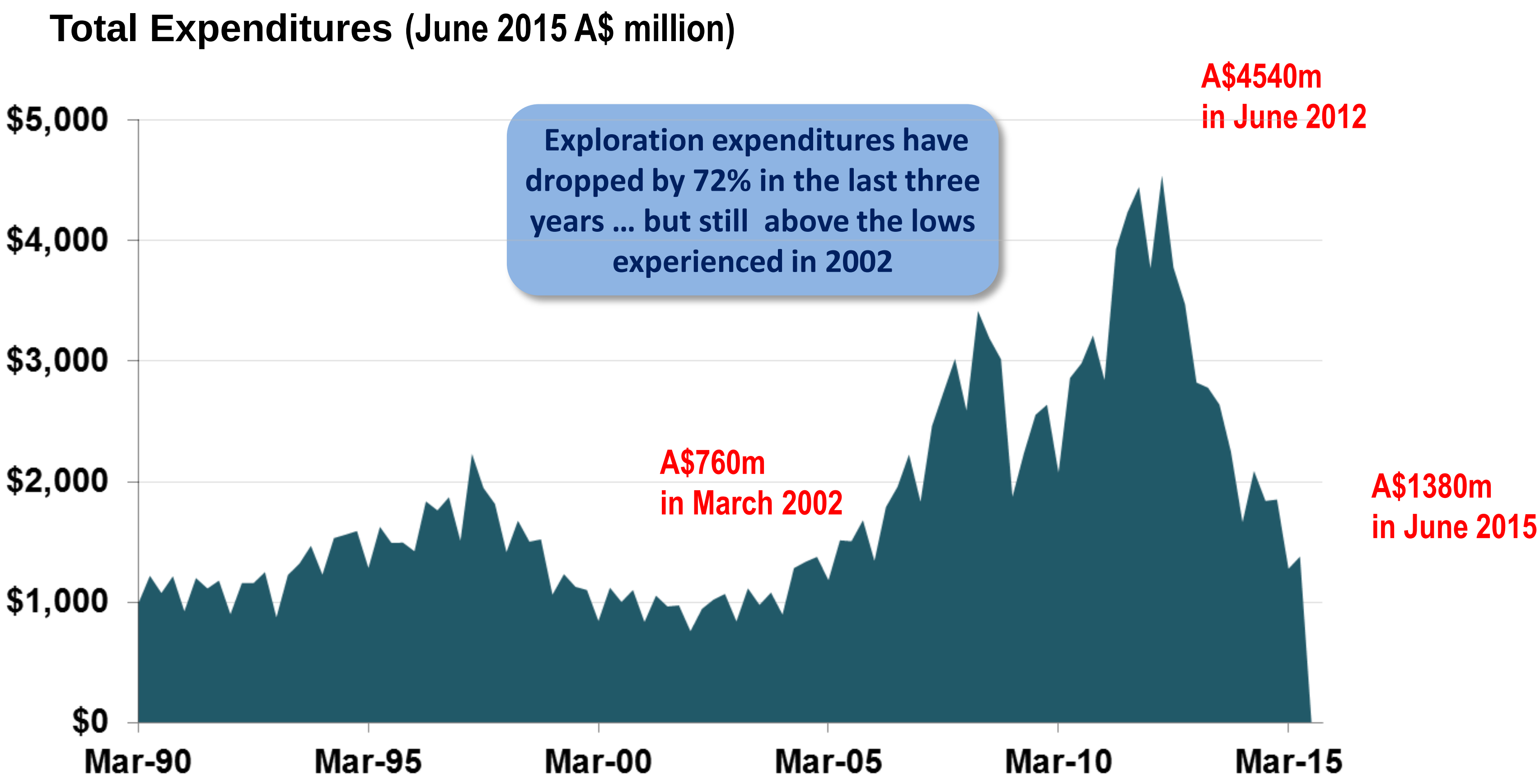
Note: Based on 1225 discoveries >= "Moderate" in size,
Excludes 414 deposits without a discovery date. Excludes satellite deposits within existing camps

Source: MinEx Consulting © November 2015

Exploration expenditures in Australia reached an all-time high in 2012

2. TRENDS IN EXPLORATION SPEND

Exploration expenditures in Australia

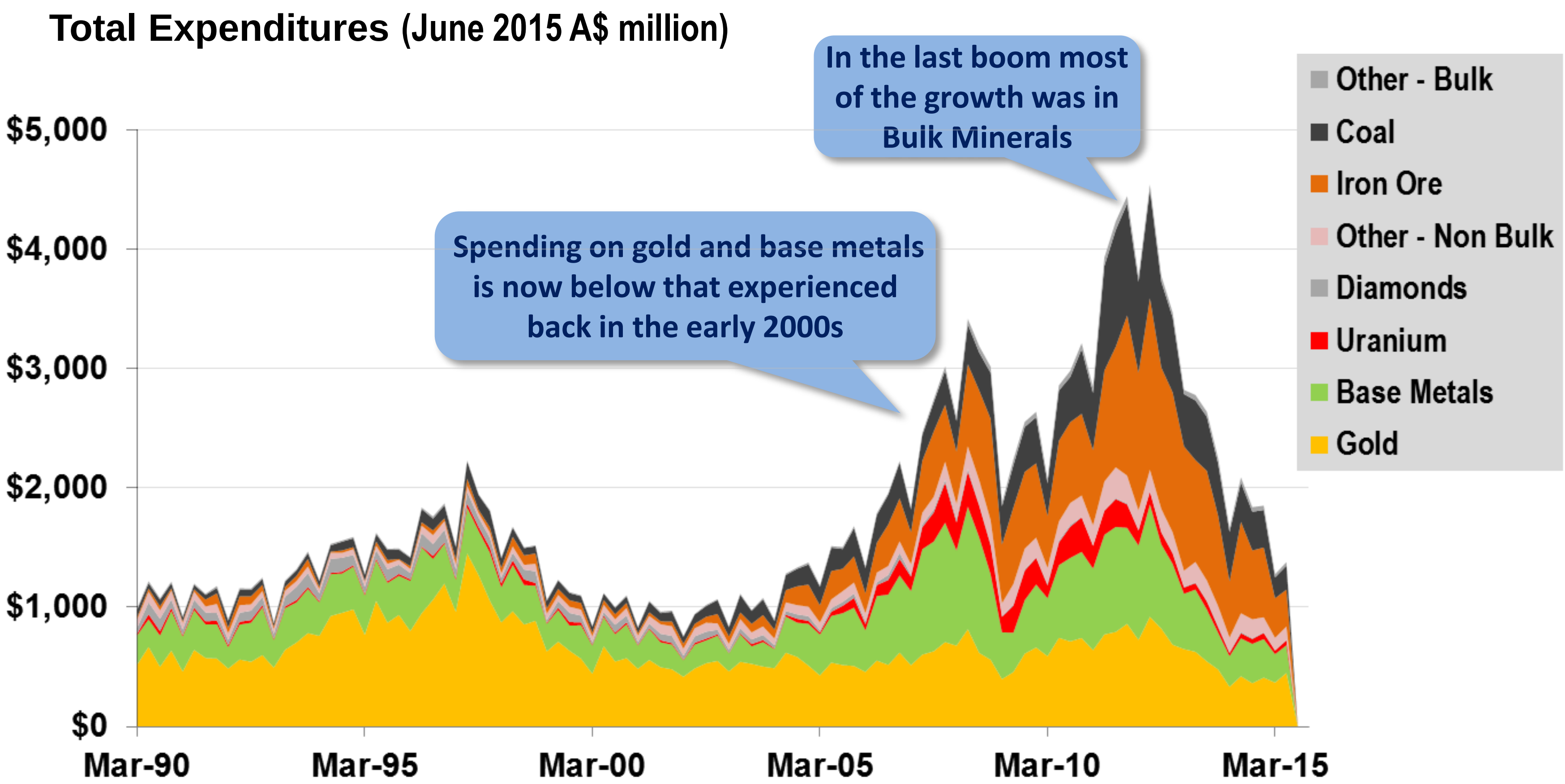


Source: ABS Cat No. 8412.0

Note: Data reported on an annualised basis
Includes exploration expenditures on Bulk Minerals (such as coal, iron ore and bauxite)

Exploration expenditures in Australia by Commodity

March 1990 to June 2015

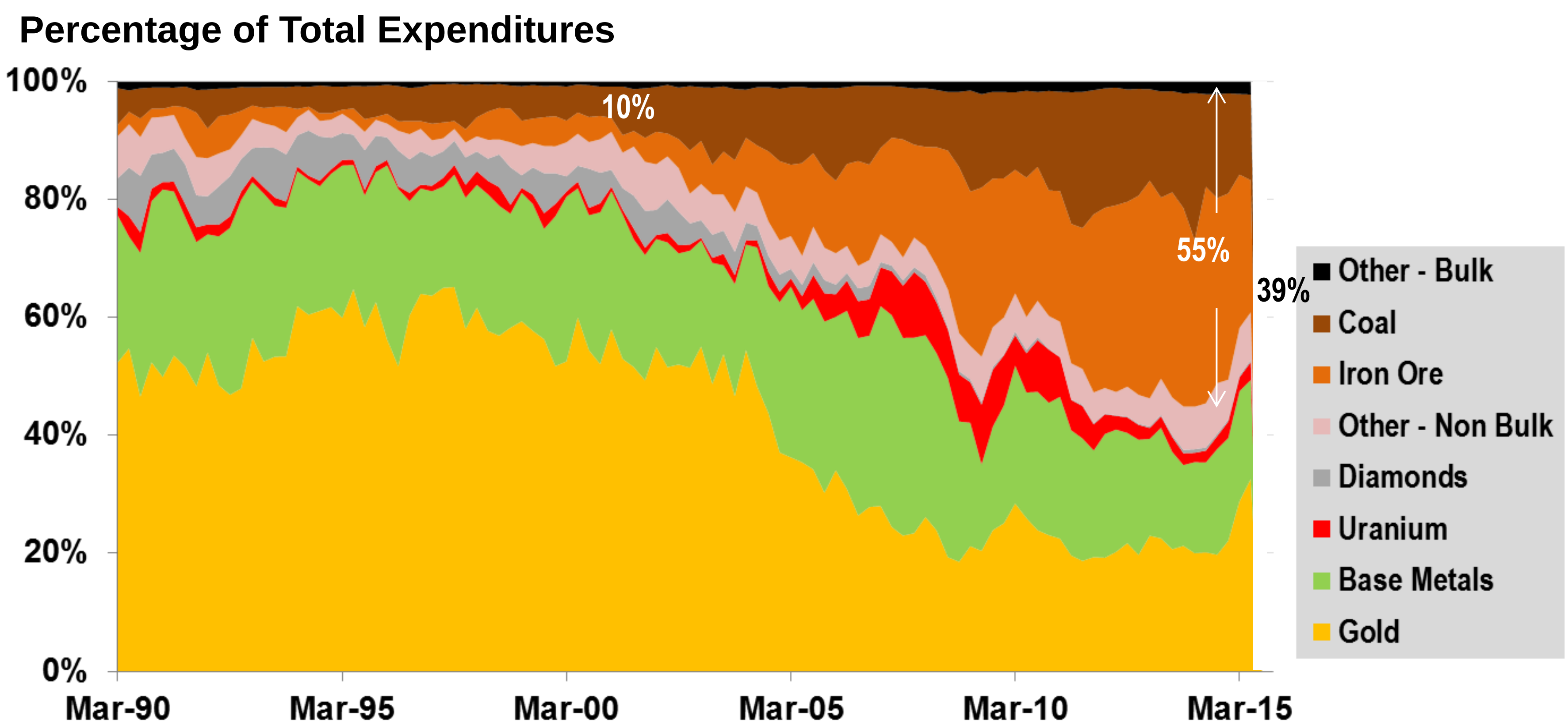


Note: Data reported on an annualised basis

Source: ABS Cat No. 8412.0

Bulk Minerals now accounts for half of the total spend

Level of exploration by Commodity in Australia: March 1990 - June 2015

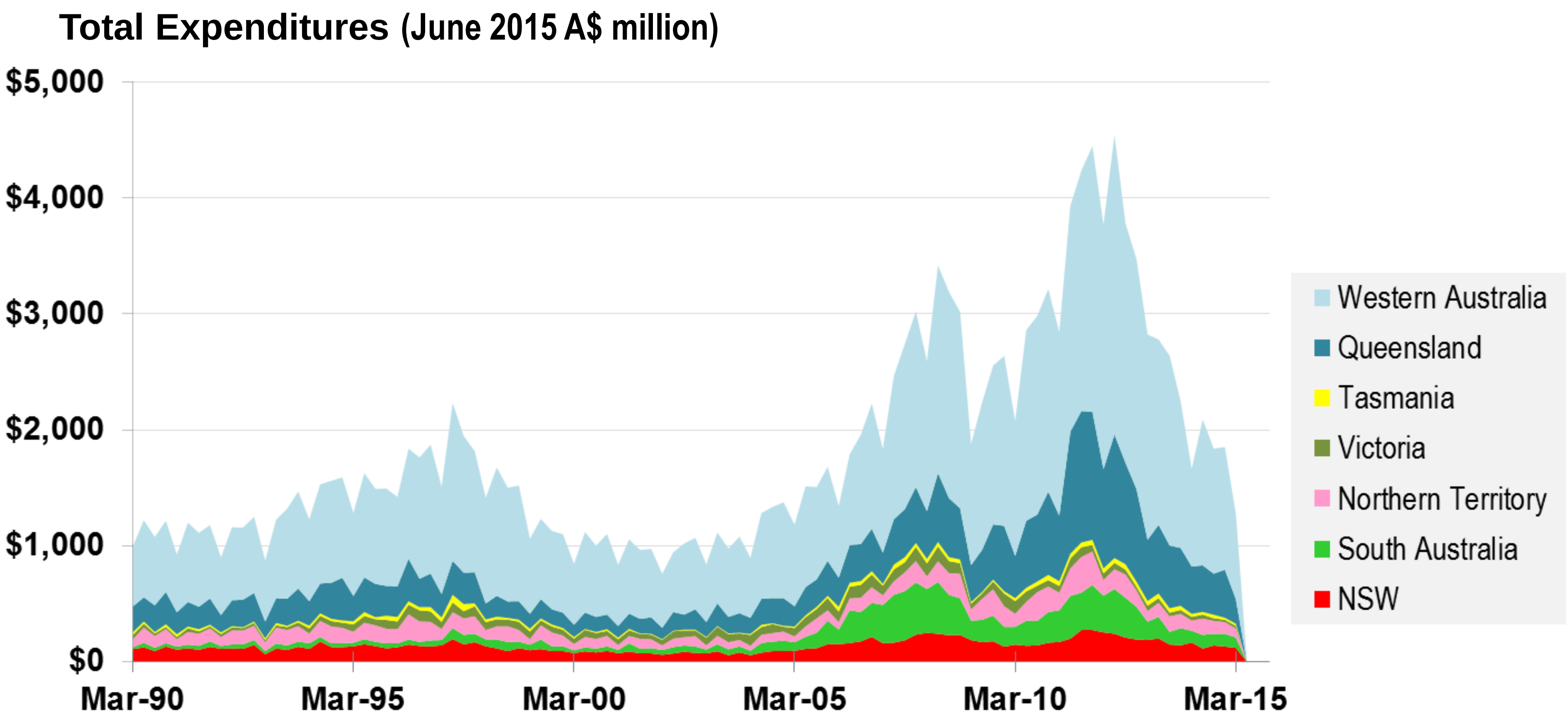


Note: Data reported on an annualised basis

Source: ABS Cat No. 8412.0

Total exploration spend in Australia by State

March 1990 - June 2015

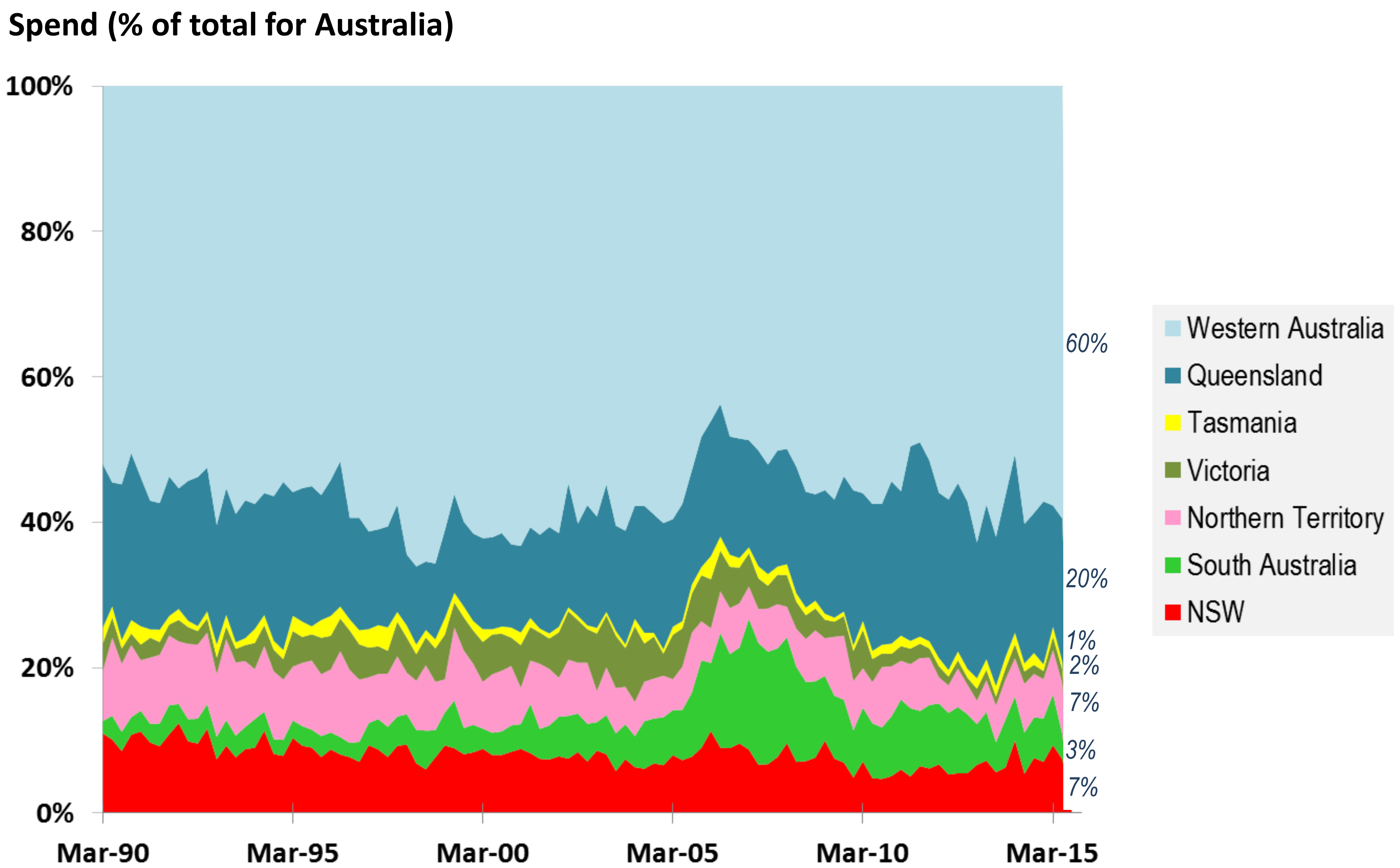


Note: Quarterly spend data is reported on an annualised basis

Source: ABS 8412

Total exploration spend in Australia by State

March 1990- March 2015



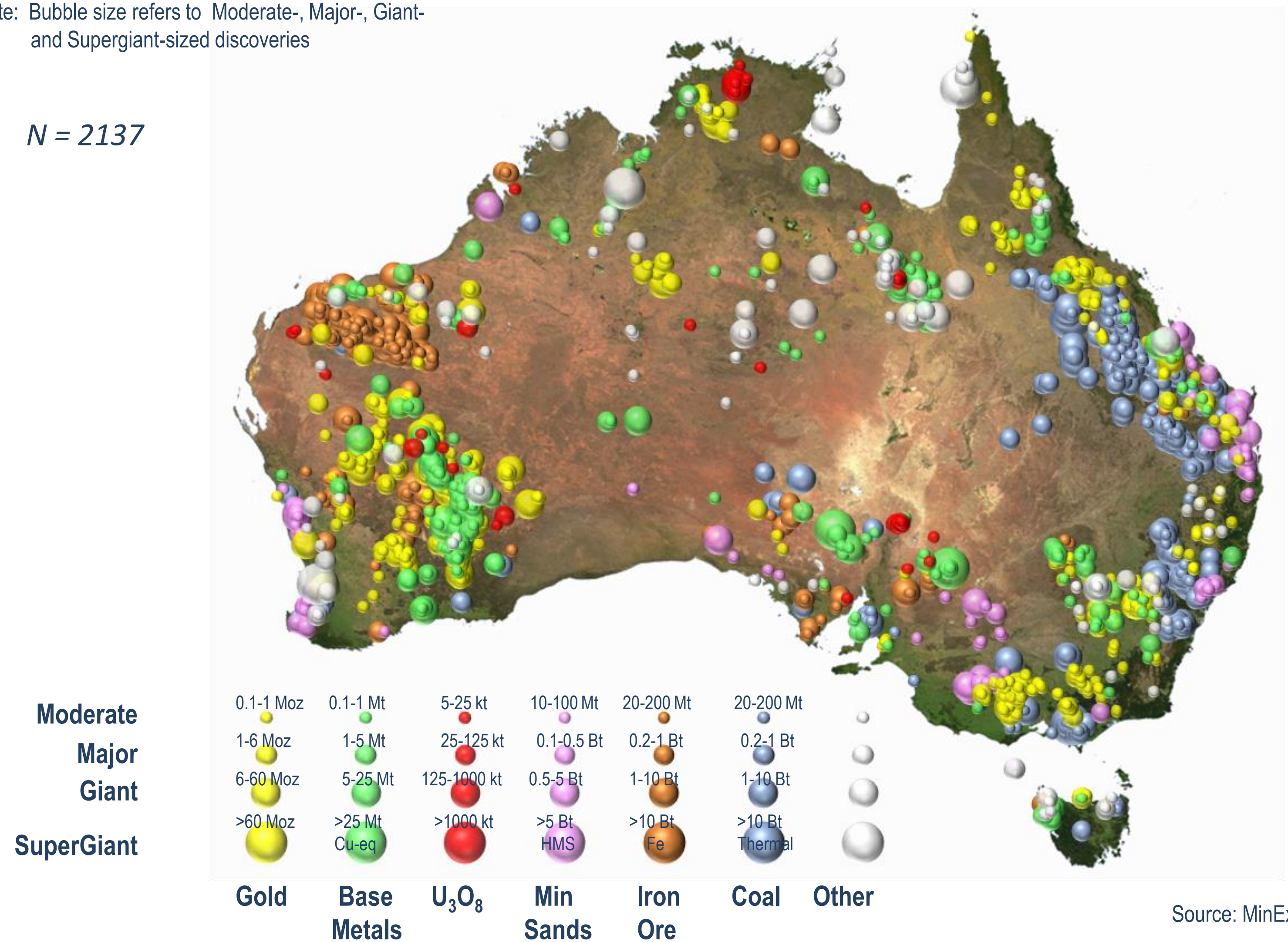
Source: ABS 8412

3. LOCATION OF DISCOVERIES

Discoveries – All Years

Note: Bubble size refers to Moderate-, Major-, Giant- and Supergiant-sized discoveries

N = 2137



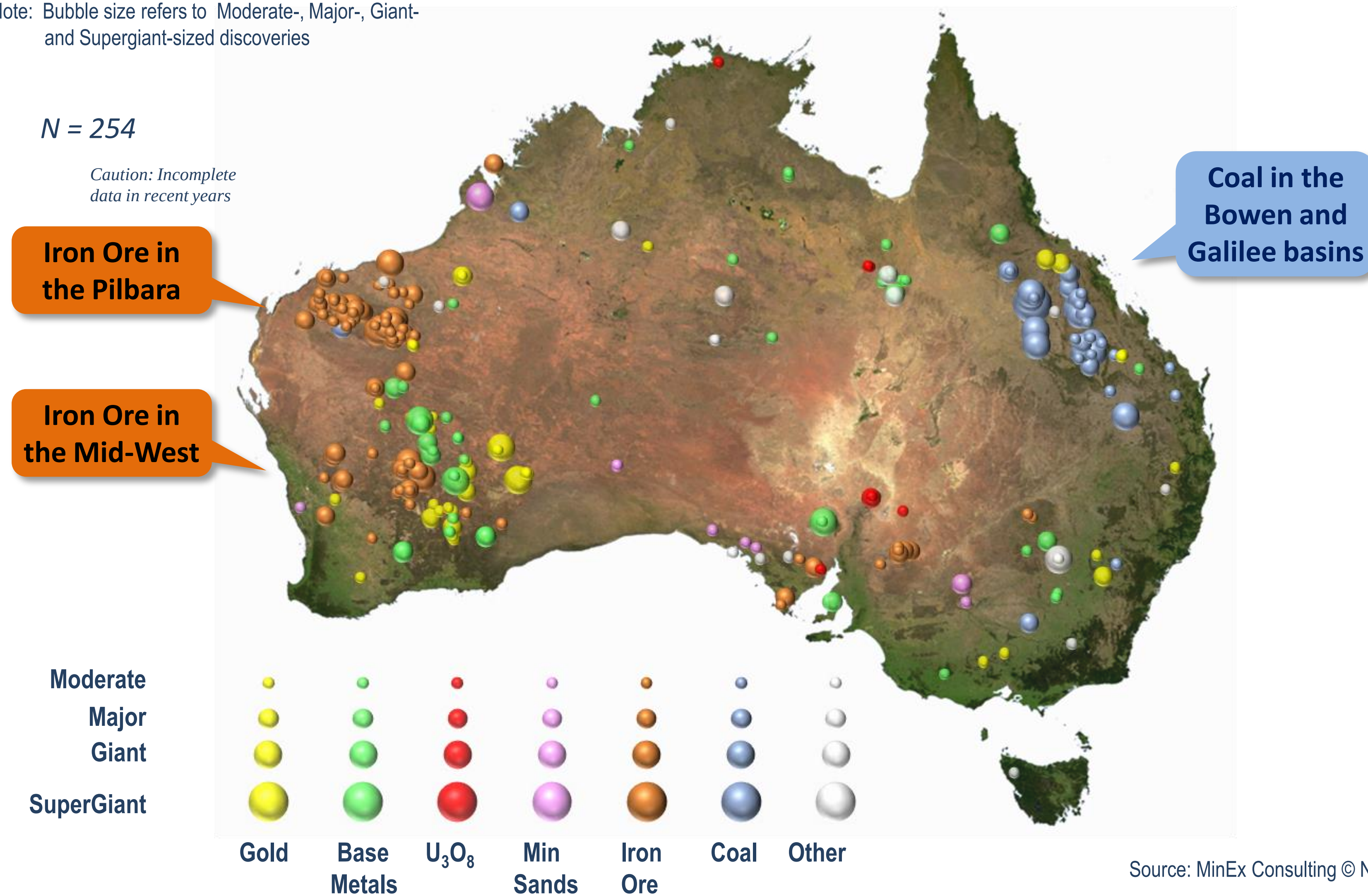
Source: MinEx Consulting © November 2015

Discoveries : 2005-2014

Note: Bubble size refers to Moderate-, Major-, Giant- and Supergiant-sized discoveries

N = 254

Caution: Incomplete data in recent years



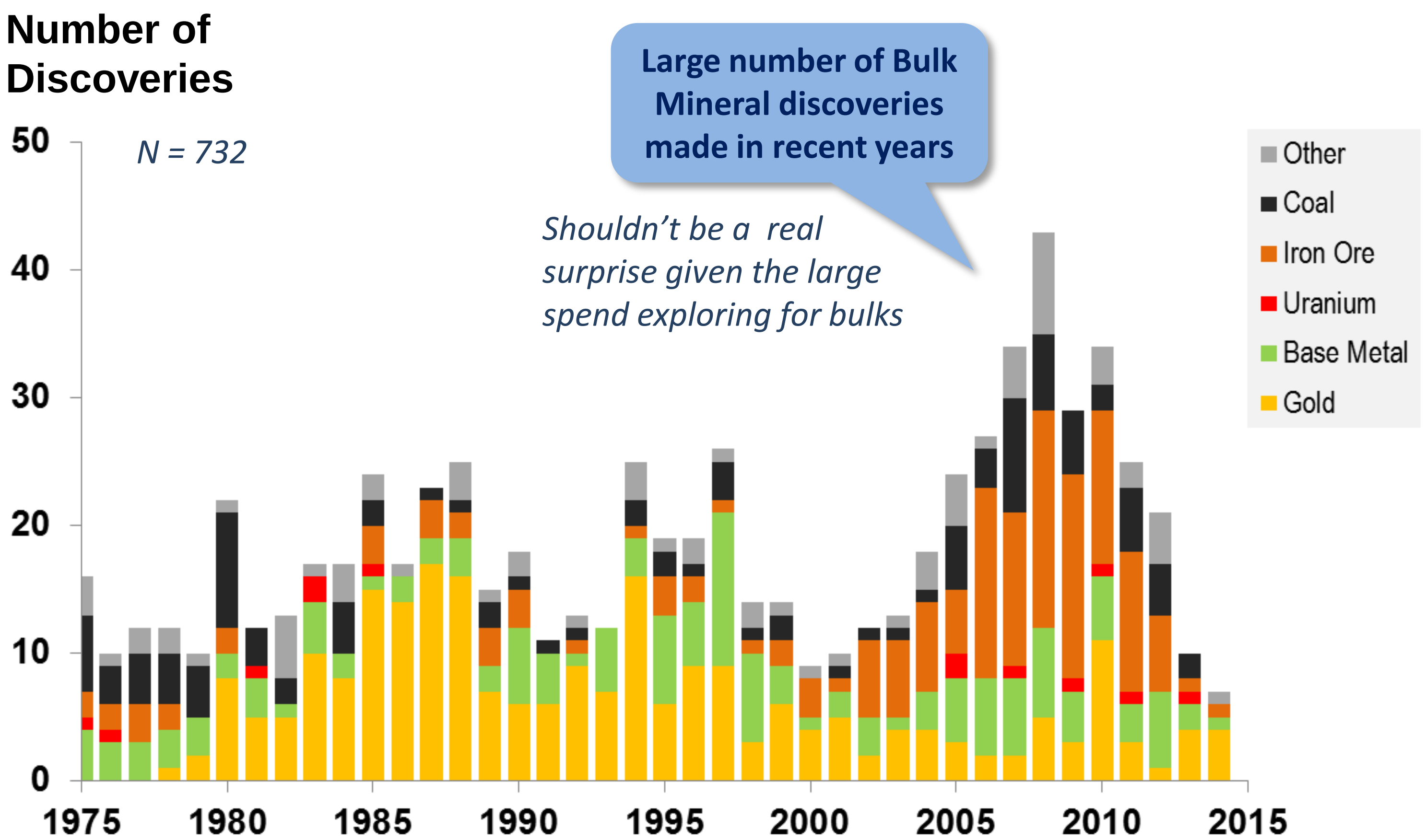
Source: MinEx Consulting © November 2015

465 significant discoveries have been made since 1975. the rate is a function of exploration spend and metres drilled

4. NUMBER OF DISCOVERIES MADE

Number of discoveries made by Commodity

Australia: 1975-2014

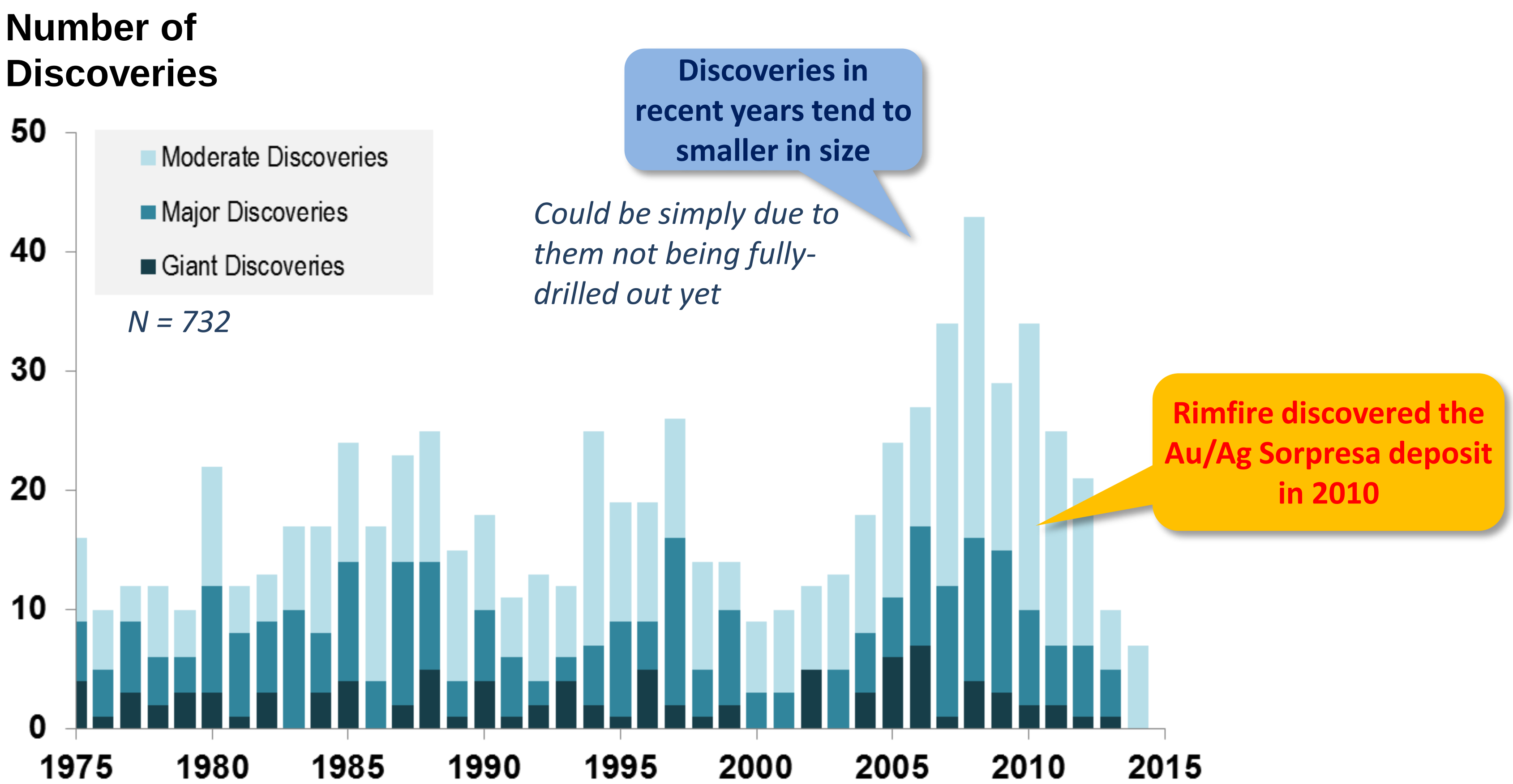


Note: Excludes satellite deposits within existing Camps. Includes Bulk Mineral discoveries..
Analysis based on Moderate-, Major- and Giant-sized deposits

Source: MinEx Consulting © November 2015

Number of discoveries made by Size

Australia: 1975-2014

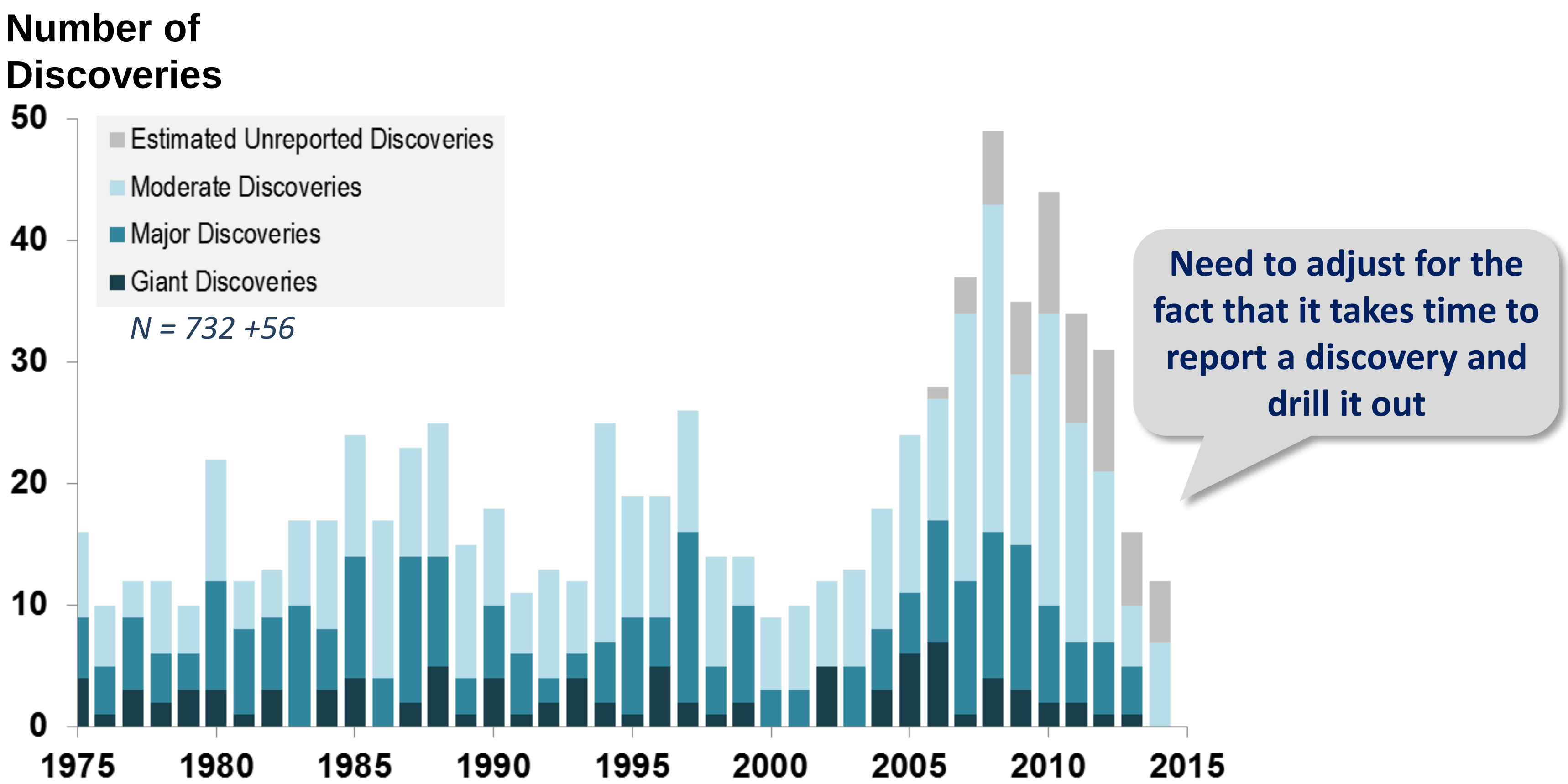


Note: Excludes satellite deposits within existing Camps. Includes Bulk Mineral discoveries..
Analysis based on Moderate-, Major- and Giant-sized deposits

Source: MinEx Consulting © November 2015

Adjusted number of discoveries made by Size

Australia: 1975-2014

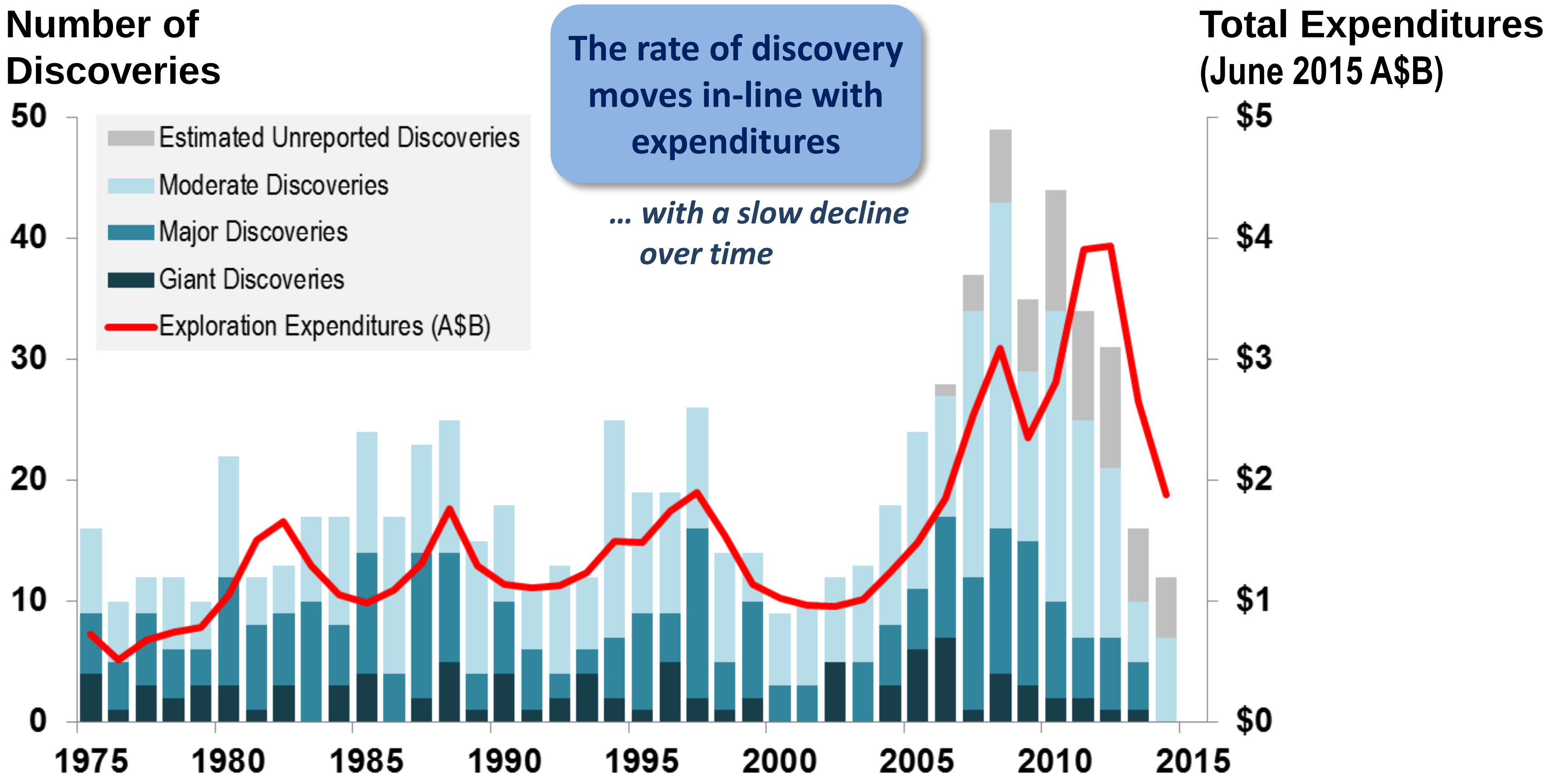


Note: Excludes satellite deposits within existing Camps. Includes Bulk Mineral discoveries..
Analysis based on Moderate-, Major- and Giant-sized deposits

Source: MinEx Consulting © November 2015

Adjusted number of discoveries versus A$ Spend

Australia: 1975-2014

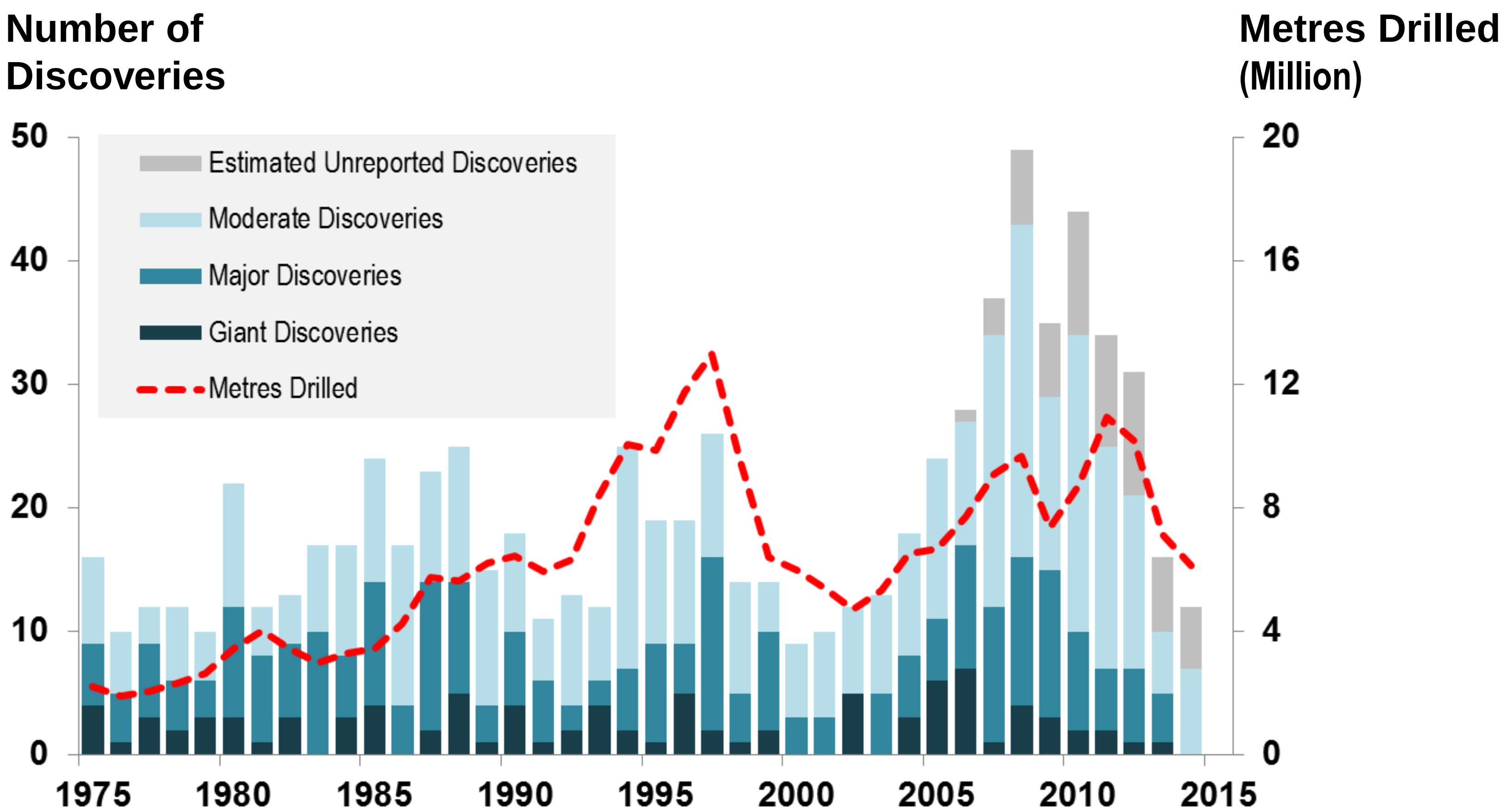


Note: Excludes satellite deposits within existing Camps. Includes Bulk Mineral discoveries..
Analysis based on Moderate-, Major- and Giant-sized deposits

Source: MinEx Consulting © November 2015

Discovery rate also moves in-line with drilling

Exploration drilling and discoveries Australia: 1975-2014

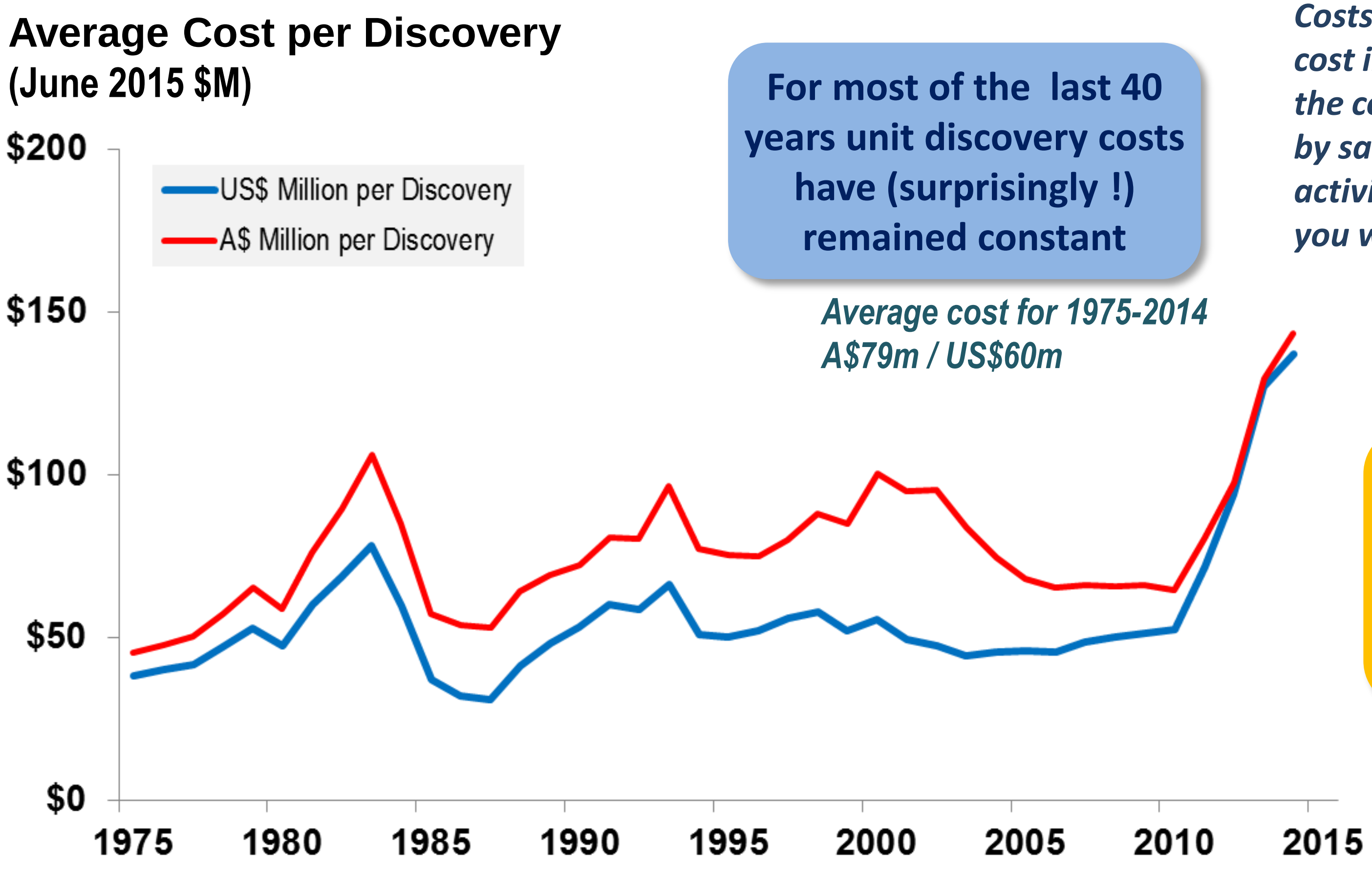


Note: Excludes satellite deposits within existing Camps. Includes Bulk Mineral discoveries..
Analysis based on Moderate-, Major- and Giant-sized deposits

Source: MinEx Consulting © November 2015

Average cost per discovery

Australia: 1975-2014



For most of the last 40 years unit discovery costs have (surprisingly !) remained constant

Costs blew out in 2010 due cost inflation associated with the commodity boom, then by savage decline in field activities … if you don't drill you wont find

Between 1999-2010 Rimfire spent a total of A$15m (US$10m) in Constant 2015 Dollars on exploration and discovered Sorpresa

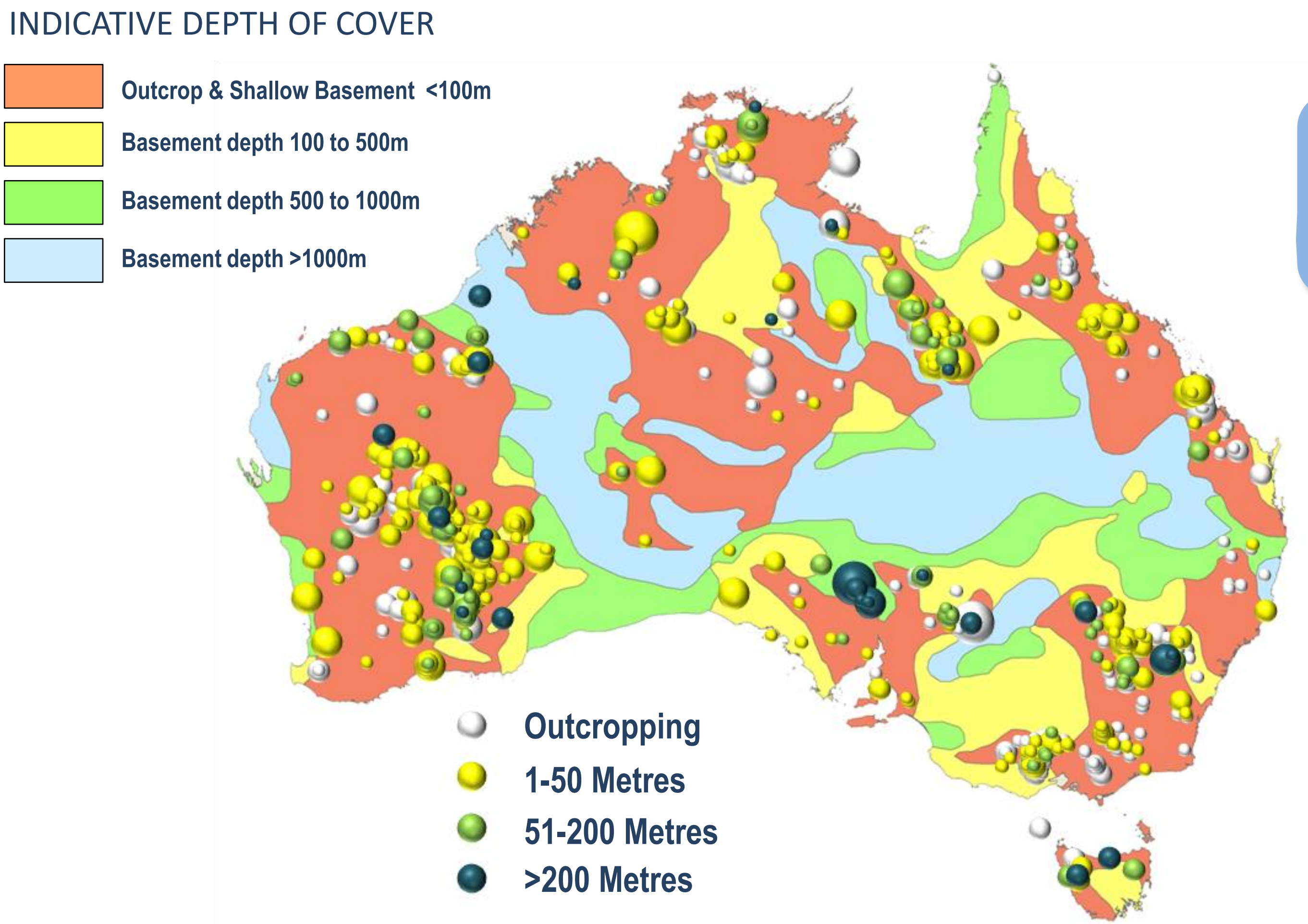
Note: Costs are calculated on a 3-year rolling average

Source: MinEx Consulting © November 2015

We are having to progressively explore under deeper cover

5. INCREASING DEPTH OF DISCOVERY

Estimated depth to basement for non-bulk mineral deposits in Australia



In general we are still exploring in areas of shallow cover

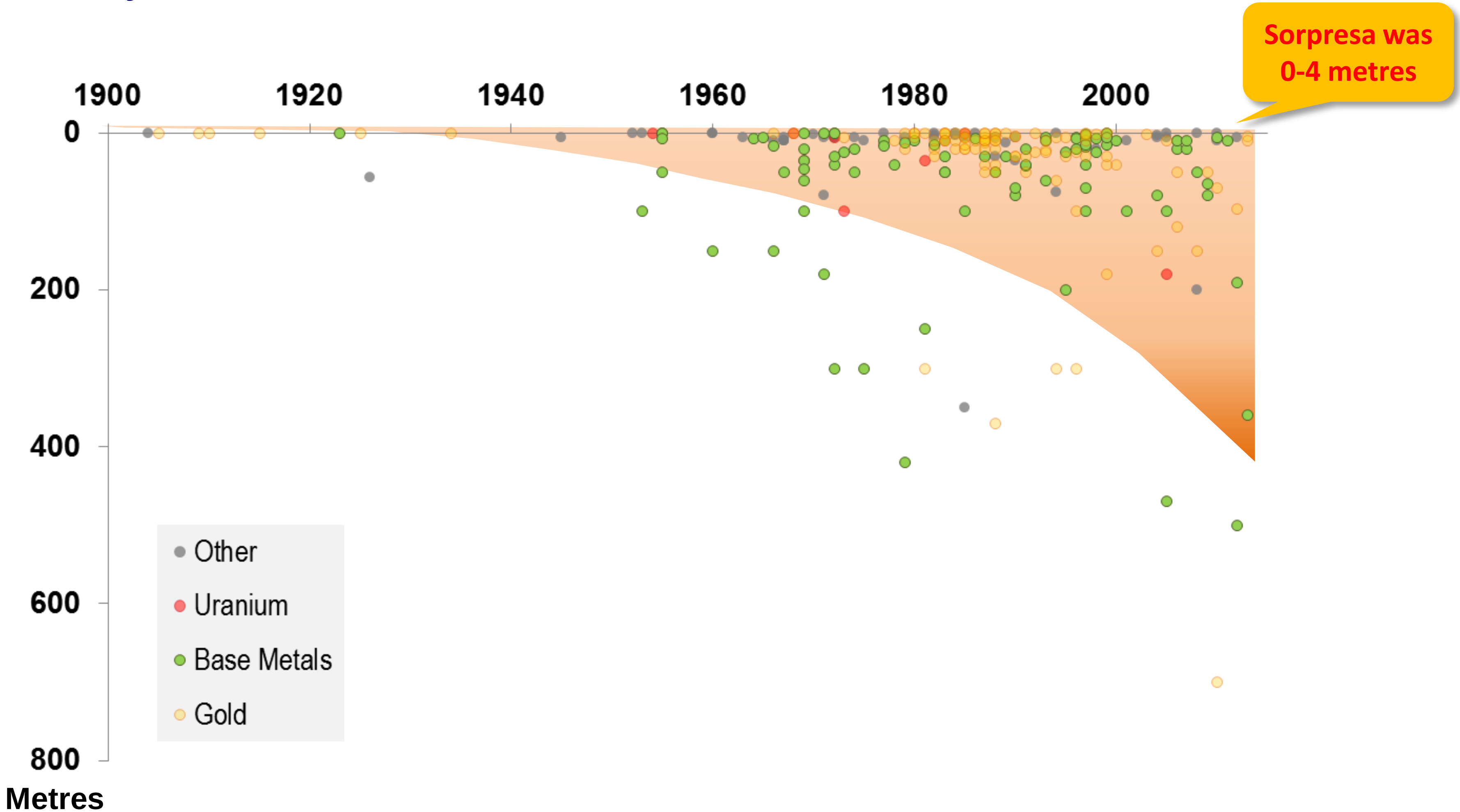
Note: Bubble size refers to Moderate-, Major-, Giant- and Supergiant-sized discoveries, using the same size criteria as before

Analysis excludes Mineral Sands Bauxite, Iron Ore and Coal

Sources: MinEx Consulting © November 2015
Geoscience Australia

Depth of cover on discoveries – by Commodity

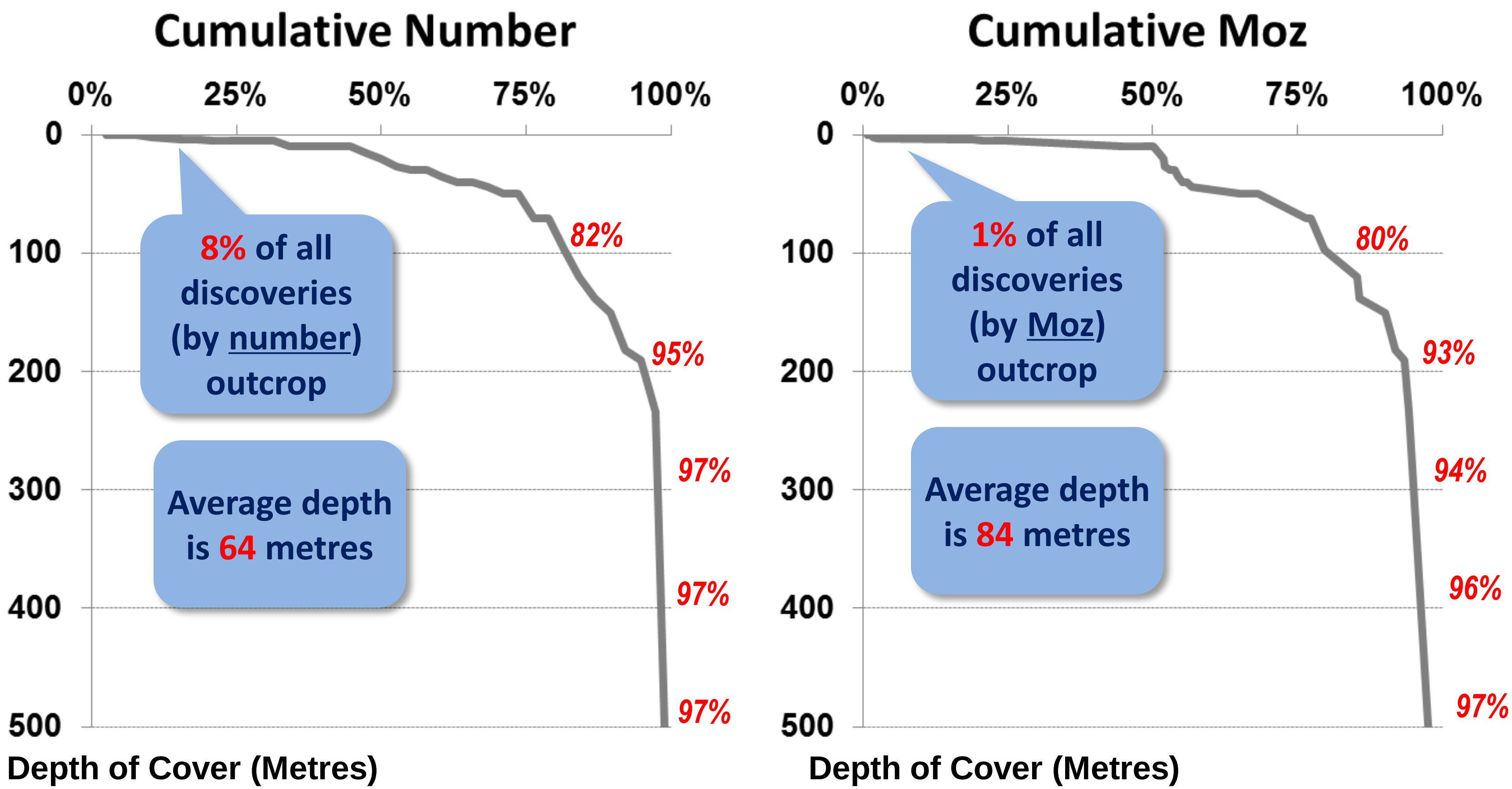
Major & Giant Mineral discoveries in Australia: 1900-2014



Note: Excludes satellite deposits within existing Camps. Also excludes Bulk Mineral discoveries.
Shaded envelope refers to depth of cover for 95% of all deposits in given decade
Analysis based on >=Major- sized deposits only

Source: MinEx Consulting © November 2015

Cumulative distribution of depth for primary gold deposits > 100 koz found in Australia:2005-2014



Note: Analysis based on 38 deposits > 100 koz.
Includes both Greenfield and Brownfield discoveries

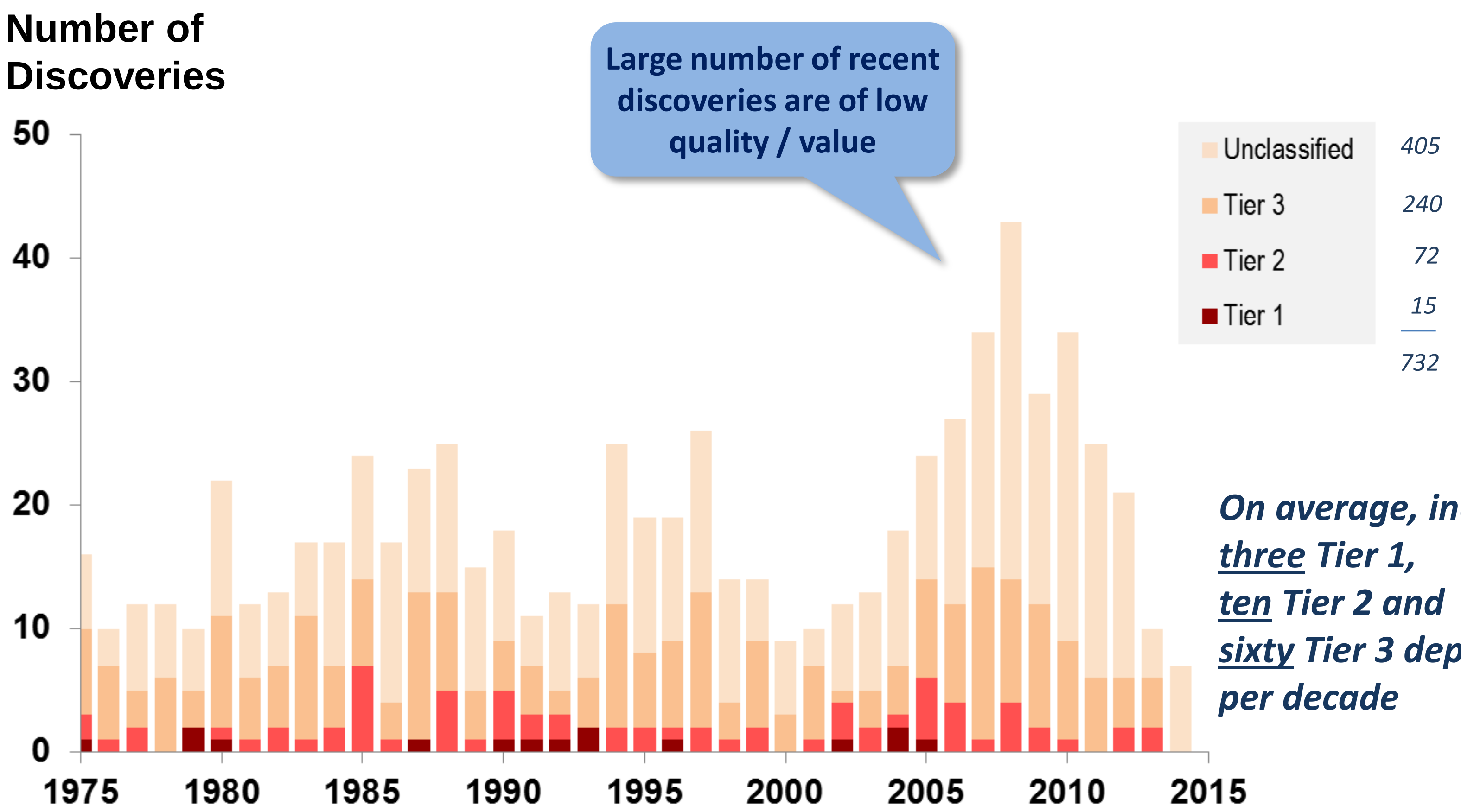
Source: MinEx Consulting © November 2015

Do we make money out of exploration?

6. QUALITY & VALUE OF THE DISCOVERIES MADE

Number of discoveries made by Quality

Australia: 1975-2014

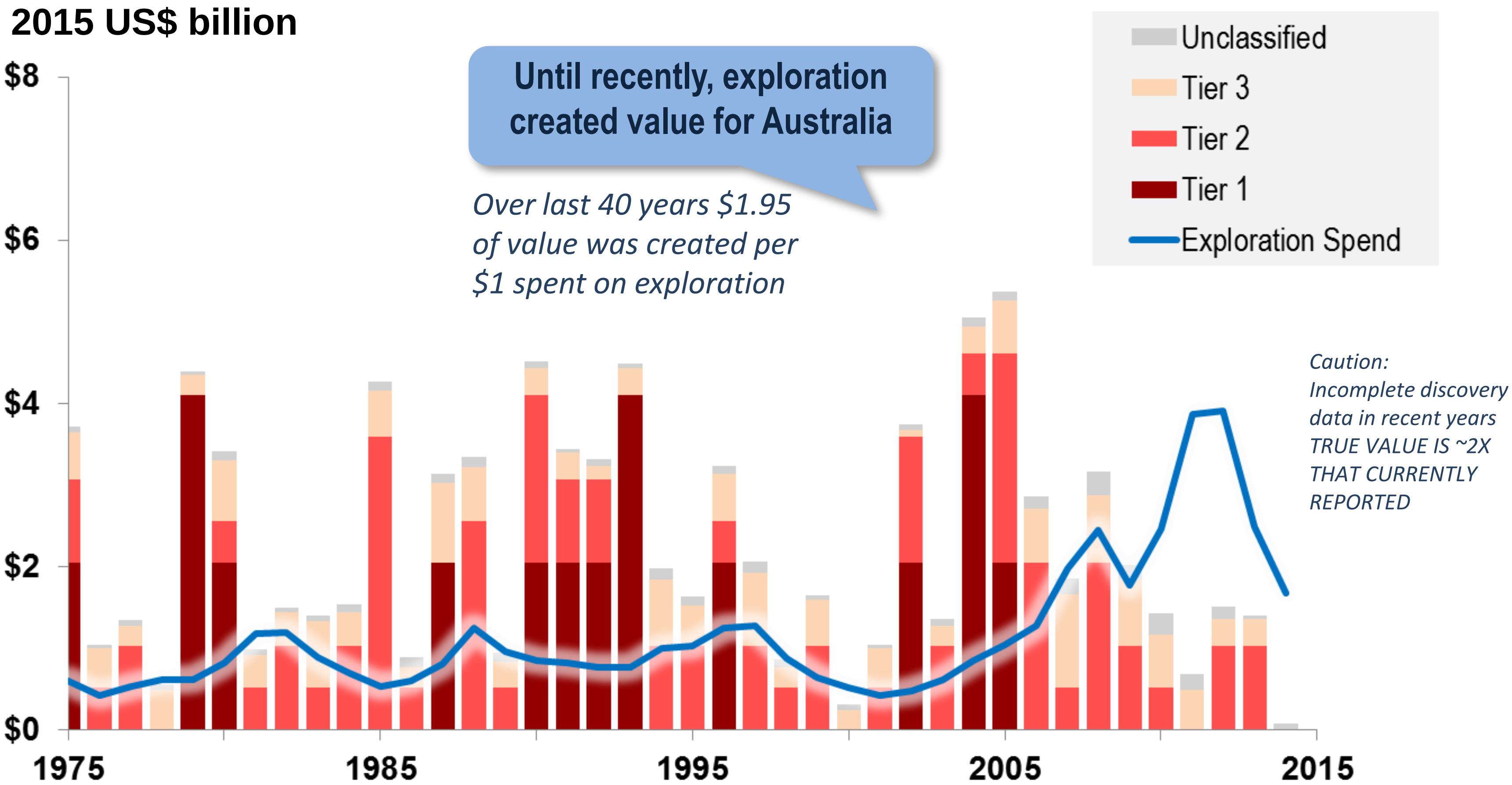


On average, industry finds <u>three</u> Tier 1, <u>ten</u> Tier 2 and <u>sixty</u> Tier 3 deposits per decade

Note: Excludes satellite deposits within existing Camps. Includes Bulk Mineral discoveries..
Analysis based on Moderate-, Major- and Giant-sized deposits

Source: MinEx Consulting © November 2015

Exploration expenditures versus expected value of discoveries in Australia



CAUTION: Values are indicative/approximate only.

No adjustment made for discovery not reaching Decision to Build milestone

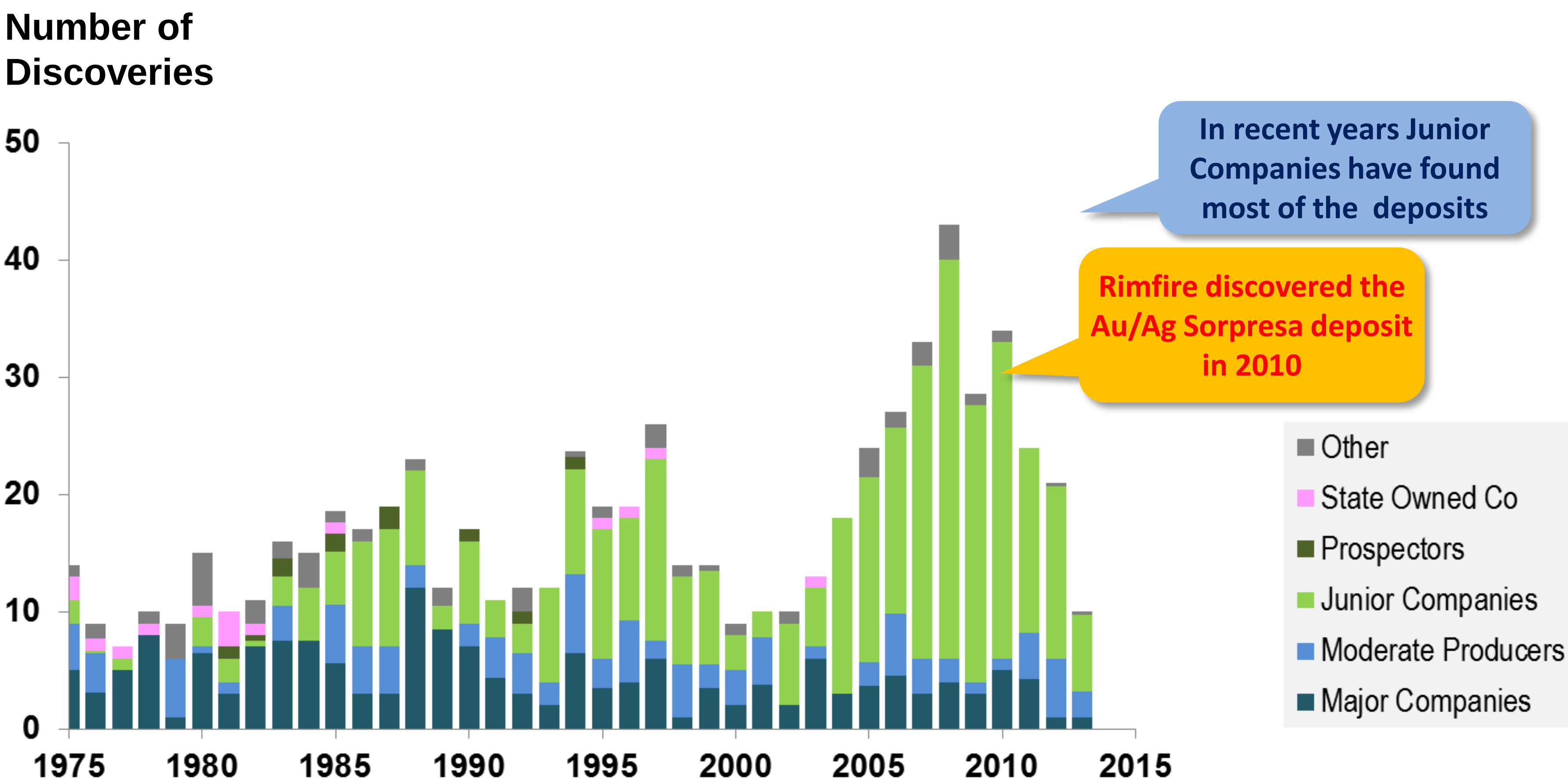
Source: MinEx Consulting © November 2015

In recent years Junior Explorers have became a key driver for Australia’s exploration performance

7. WHO MADE THE DISCOVERIES ?

Percentage of discoveries made by Company Type

Moderate+Major+Giant discoveries in Australia: 1975-2014

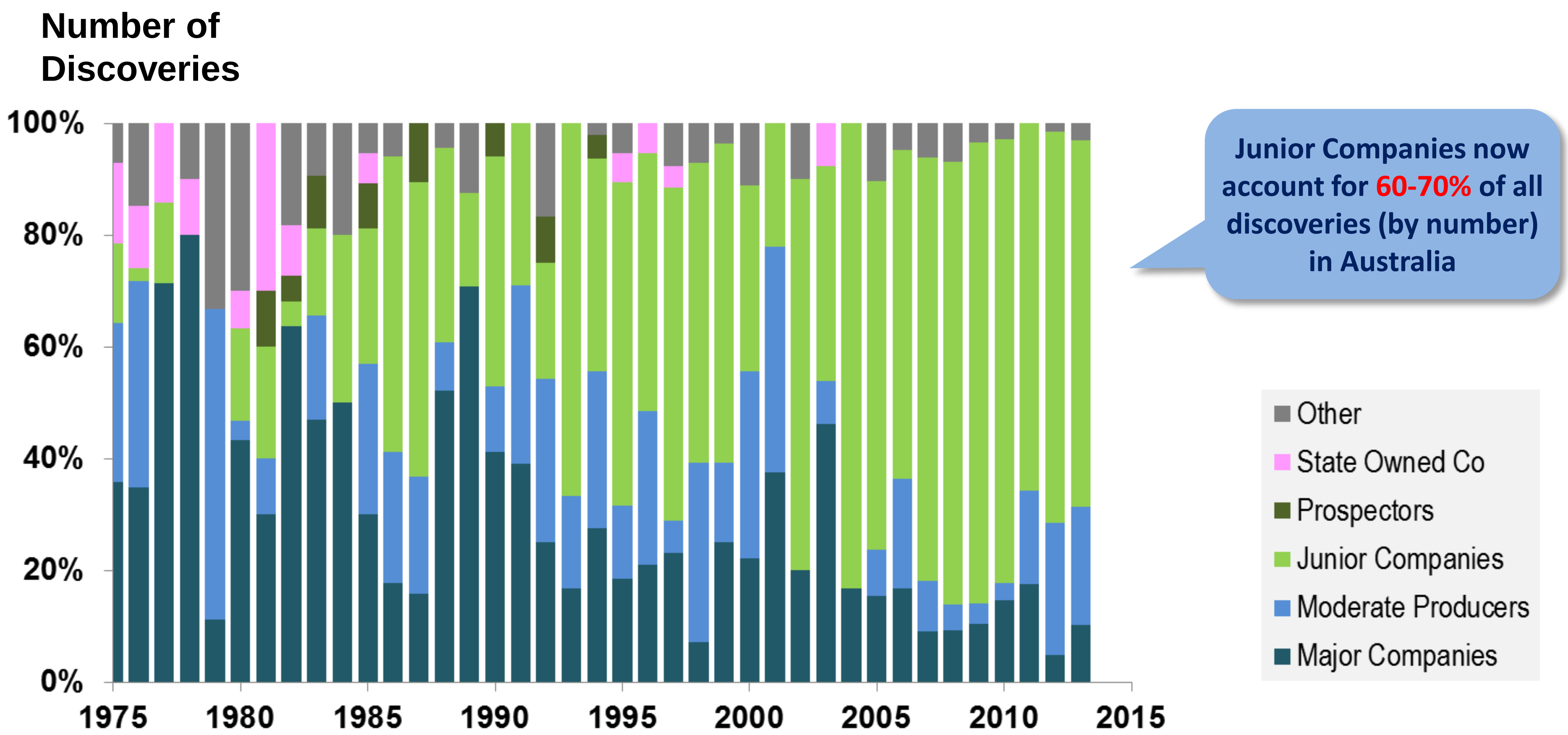


Note: Figures are adjusted for shared discoveries
Excludes satellite deposits within existing Camps

Source: MinEx Consulting © November 2015

Percentage of discoveries made by Company Type

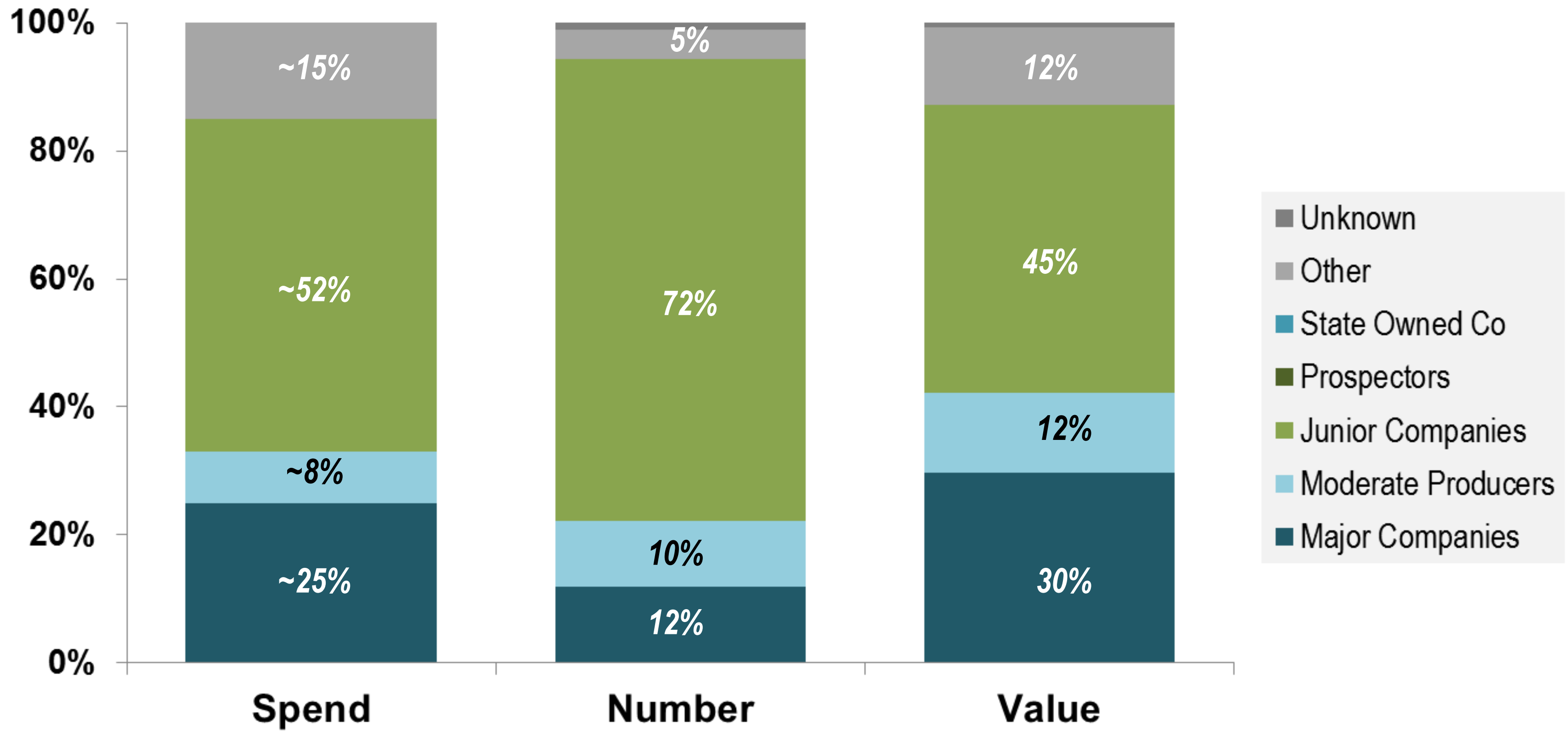
Moderate+Major+Giant discoveries in Australia: 1975-2014



Note: Figures are adjusted for shared discoveries
Excludes satellite deposits within existing Camps

Source: MinEx Consulting © November 2015

Majors versus Juniors
Australia: 2005-2013



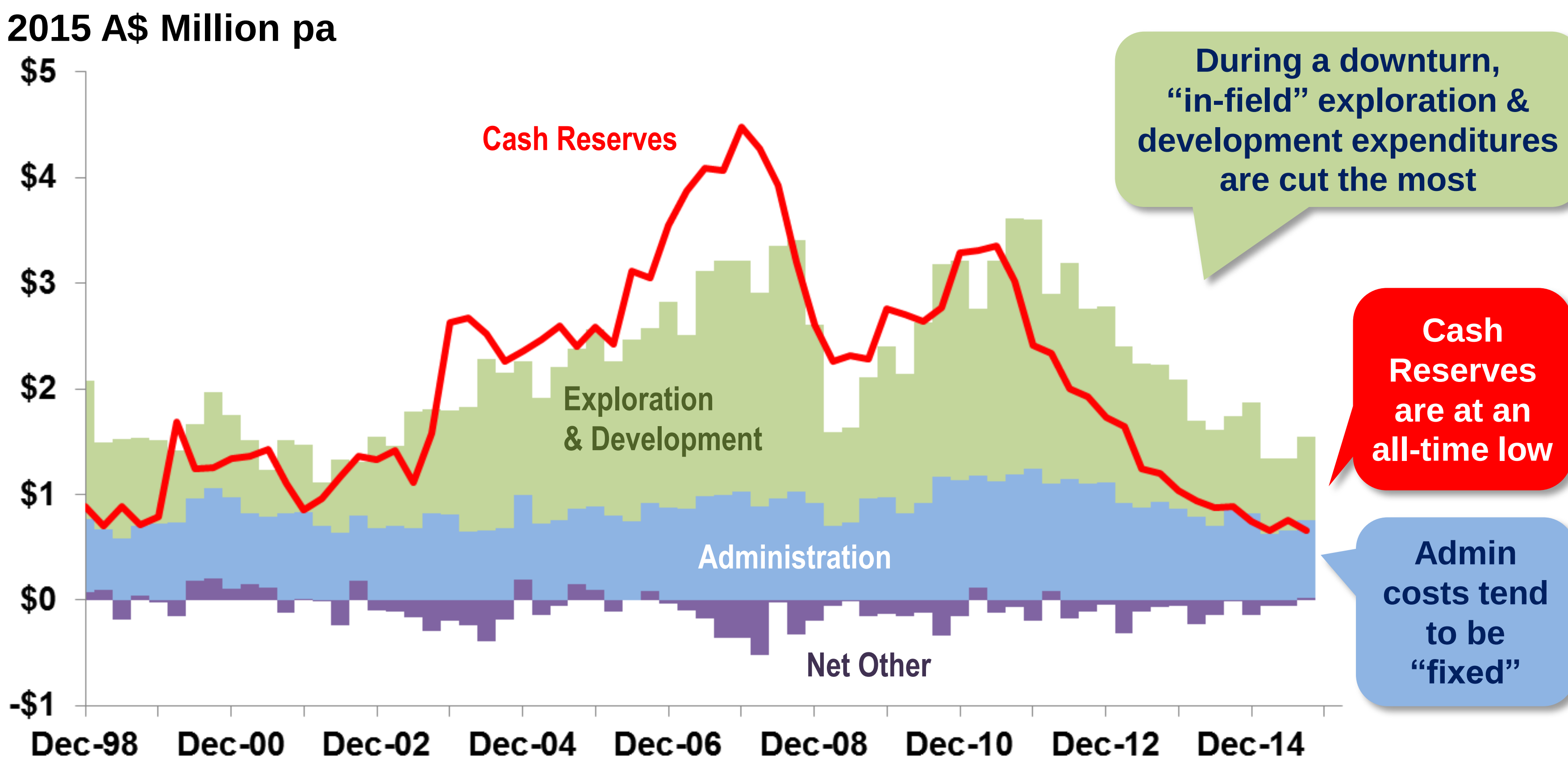
Note: Figures are adjusted for shared discoveries
Excludes satellite deposits within existing Camps
Exploration expenditures are approximate only

Source: MinEx Consulting © November 2015

Junior Explorers are struggling to raise cash – which severely impacts on their level of work in the field

8. FINANCIAL CHALLENGES FACING JUNIOR COMPANIES

Cash Reserves and Expenditures for the MEDIAN Australian Junior Exploration Company : 1998-Sept 2015



Note: Survey based on a sample of 320 junior exploration companies listed on the ASX between 1998-2015
"Net Other" includes production and other costs less interest income, mine revenue, Government Assistance and R&D tax credits
Quarterly spend data has been multiplied by 4x to produce an annualised spend rate

Source: MinEx Consulting © November 2015 based on Quarterly Reports to the ASX

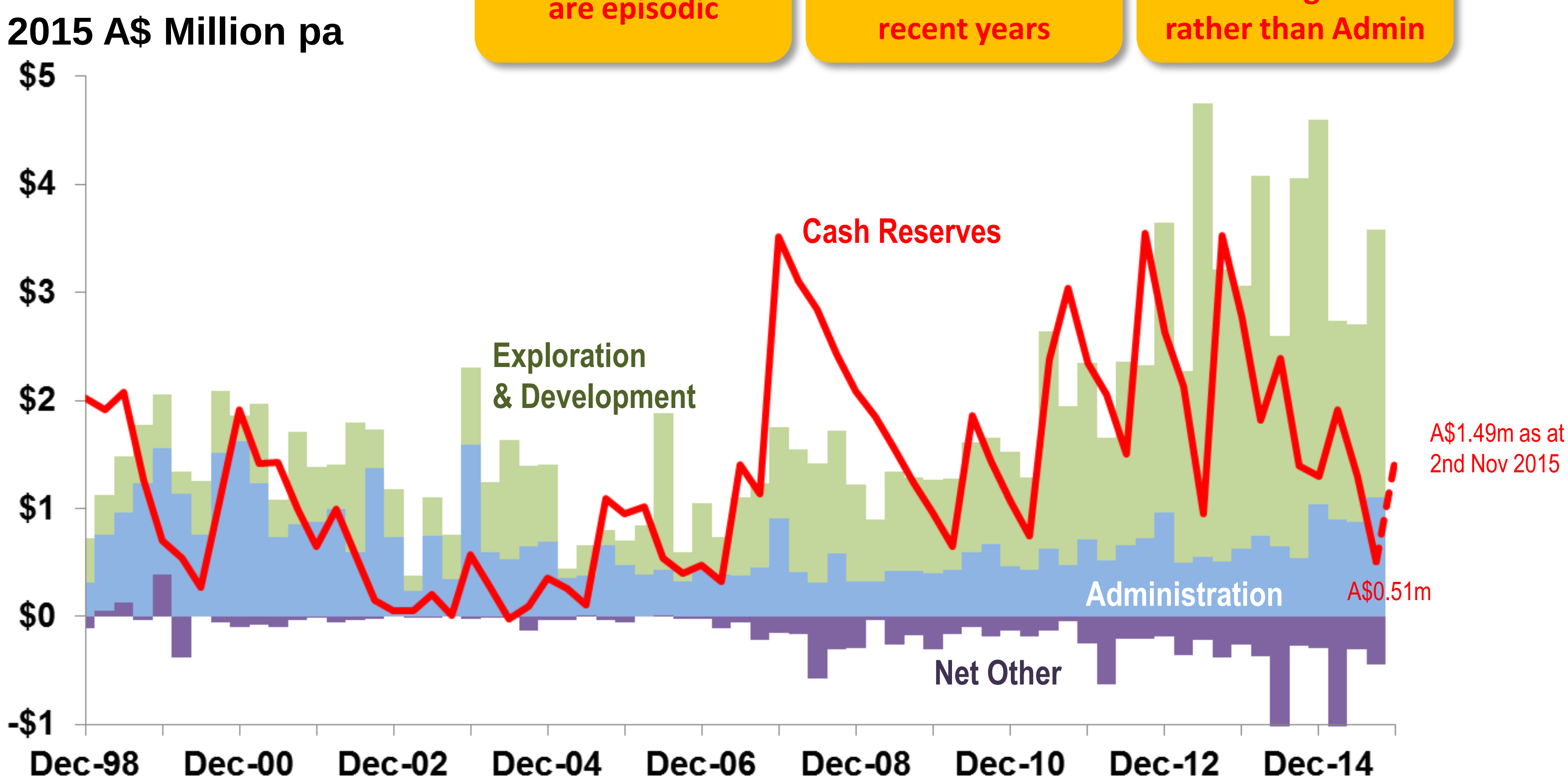
Cash Reserves and Expenditures

Rimfire Pacific Mining: December 1998-September 2015

RIM's cash raisings are episodic

RIM's expenditures have doubled in recent years

Most of the spend is "into the ground" rather than Admin

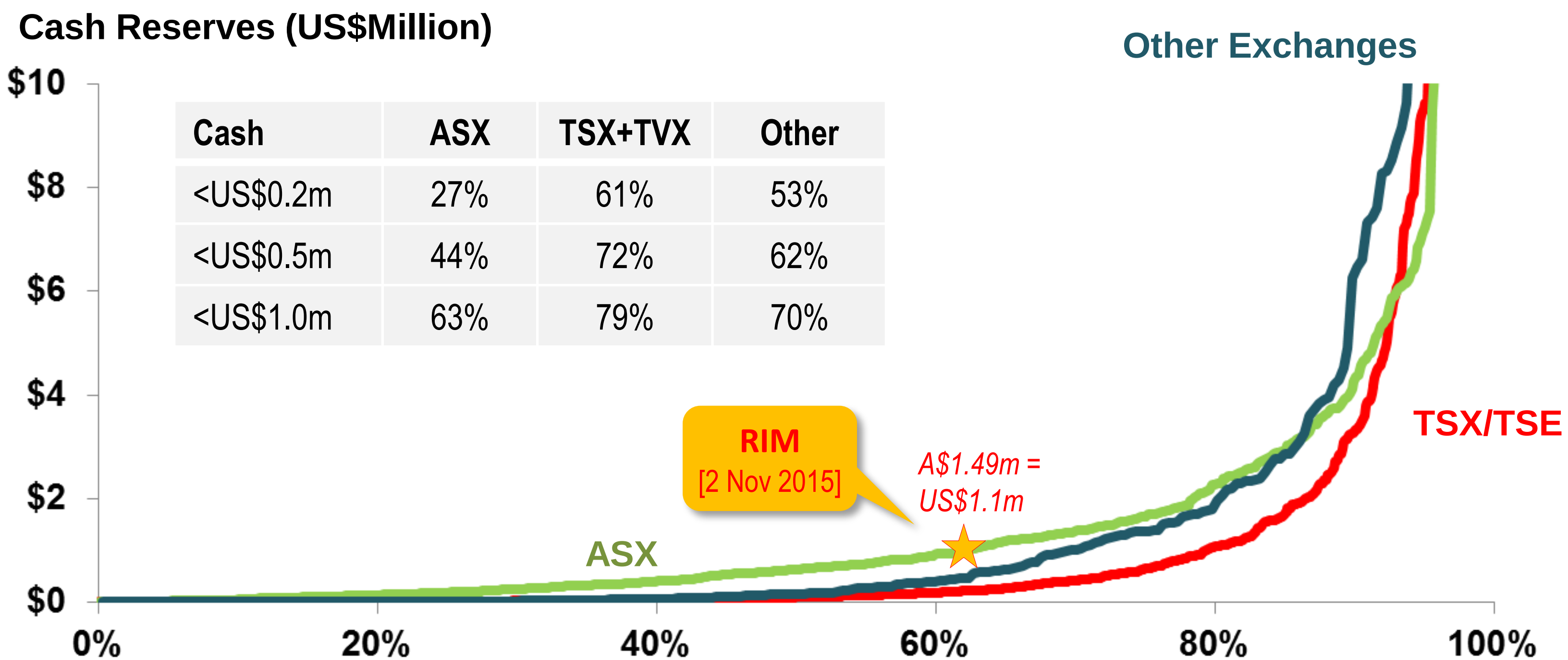


Source: MinEx Consulting © November 2015 based on Quarterly Reports to the ASX

Note: "Net Other" includes production and other costs less interest income, mine revenue, Government Assistance and R&D tax credits

Quarterly spend data has been multiplied by 4x to produce an annualised spend rate

Most Junior Explorers in Australia & Overseas currently have less than $1m in Cash Reserves

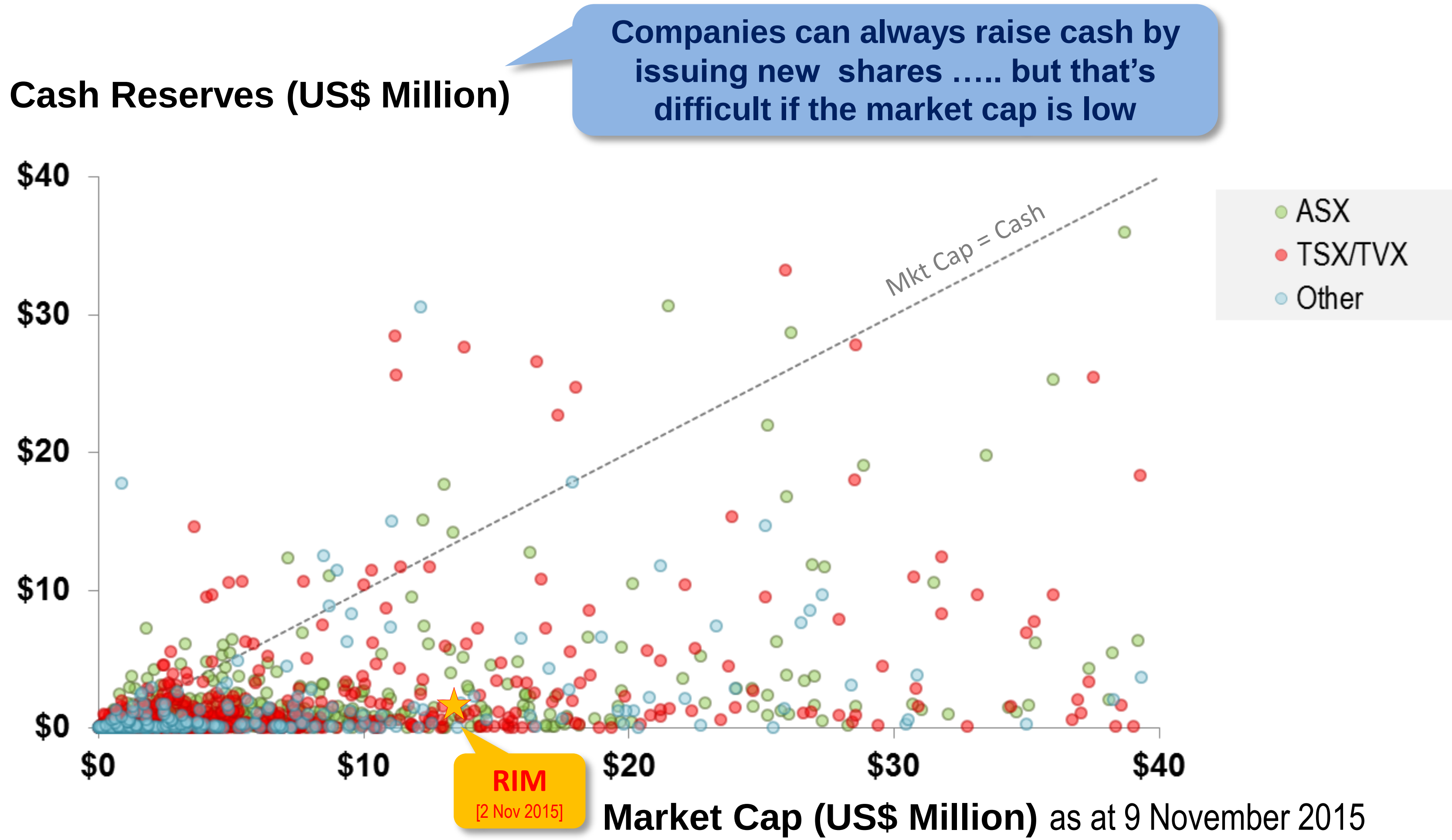


Cash	ASX	TSX+TVX	Other
<US$0.2m	27%	61%	53%
<US$0.5m	44%	72%	62%
<US$1.0m	63%	79%	70%

Note: Based on an analysis of the cash reserves (as at June-Sept 2015) for 2027 publicly listed Junior Explorers - 1151 on the TSX/TVX, 589 on the ASX and 287 on other exchanges (such as the CSE, NYSE, AIM, NEC, NZE,OTC and NEC and Pink Sheets). Excludes companies with annual revenues >US$1m.
Based on ExRate of US$1.00 = C$1.33 = A$1.38

Source: MinEx Consulting © November 2015

The lack of cash is of main concern to those junior companies with low market caps



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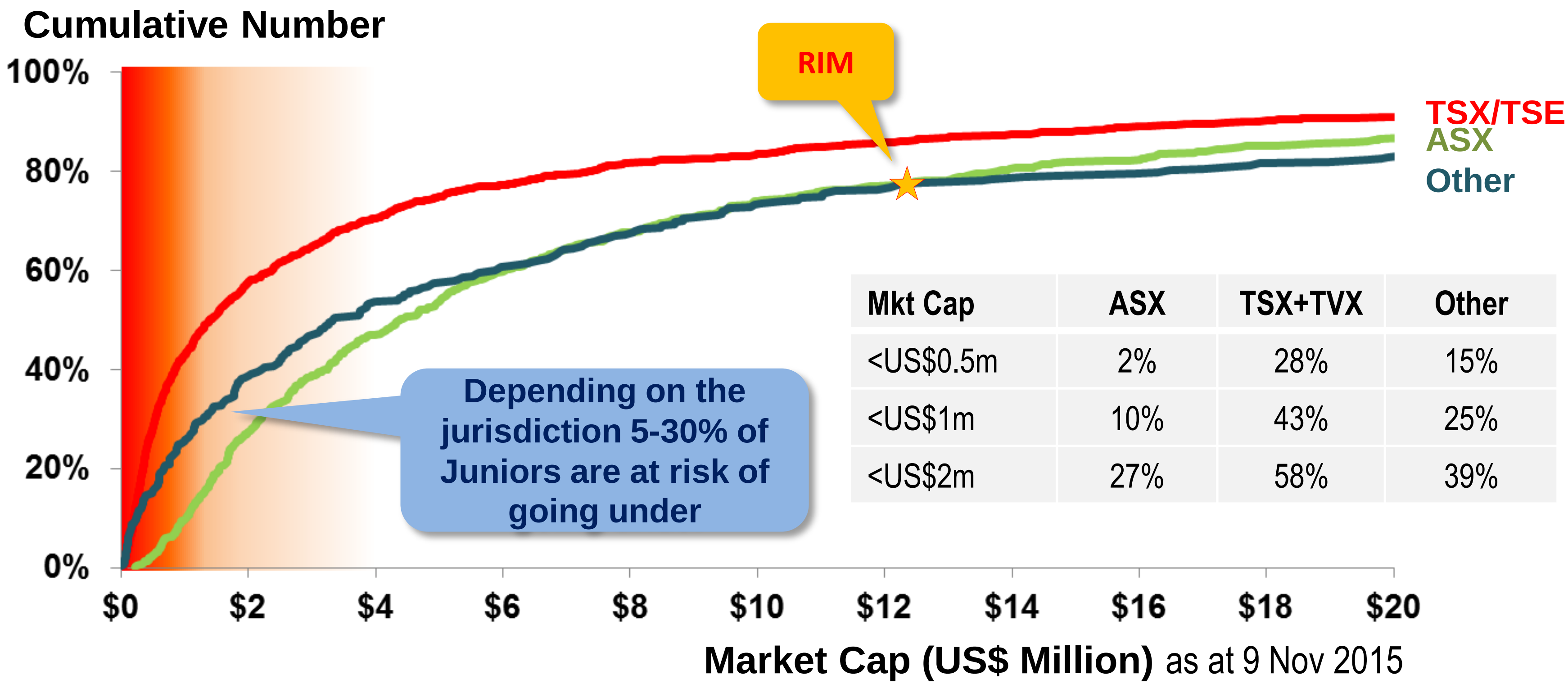
Source: MinEx Consulting © November 2015

Junior Explorers with very small market-caps are at most risk of failing



Mkt Cap	ASX	TSX+TVX	Other
<US$0.5m	2%	28%	15%
<US$1m	10%	43%	25%
<US$2m	27%	58%	39%

Note: Based on an analysis of the cash reserves (as at June-Sept 2015) for 2027 publicly listed Junior Explorers - 1151 on the TSX/TVX, 589 on the ASX and 287 on other exchanges (such as the CSE, NYSE, AIM, NEC, NZE,OTC and NEC and Pink Sheets). Excludes companies with annual revenues >US$1m.
Based on ExRate of US$1.00 = C$1.33 = A$1.38

Source: MinEx Consulting © November 2015

Summary / Conclusions [1/3]

1. Two centuries of discovery in Australia
   - Australia's exploration history is driven by "droughts" and innovation
   - Half of significant deposits have been found in the last 32 years
2. Trends in Exploration spend
   - Reached an all-time high of A$4.5 billion in June 2012. Is only 30% of that now!
   - Bulk minerals make up nearly half of current spending in Australia
3. Location of discoveries
   - Discoveries made in all States with most in Western Australia
4. Number of discoveries
   - On average 15-25 significant discoveries are made each year in Australia
   - Discovery rates follow spending (and drilling) … but performance has declined in recent years (due to higher input costs and over-focus on brownfield targets)

Summary / Conclusions [2/3]

5. Change in the depth of discovery
   - Have to progressively explore under deeper cover. +200 metres is not uncommon. Average depth for gold is 64 metres.
   - Even so, majority of discoveries are still made under shallow cover

6. Quality & Value of Discoveries
   - Tier 1 deposits are the most valuable (>$2billion) – but very rare (only 3 per decade in Australia)
   - Over last 40 years, industry generated on average $1.95 of value per $1 spend exploration
   - Appears to be a decline in the value and quality of recent discoveries – due to over-focus on brownfield targets

Summary / Conclusions [3/3]

7. Who made the discoveries ?
   - Juniors are key driver for industry's discvoery performance
   - Over the last decade Junior Companies accounted for ~52% of exploration spend, found 72% of the deposits and 45% of the value.

7. Financial challenges facing Junior Companies
   - Cash reserves are at an all-time low
   - Median Australian Junior explorer has less than 6 months of cash available.
   - They will need to place more shares – but this is very hard if the market cap is low
   - The number of Juniors in deep hibernation has increased 4-fold in the last 6 years. Currently ~6% of Juniors are doing zero exploration
   - Juniors are survivors. Most will live to see another day

Contact details

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Copies of this and other similar presentations can be downloaded from my website

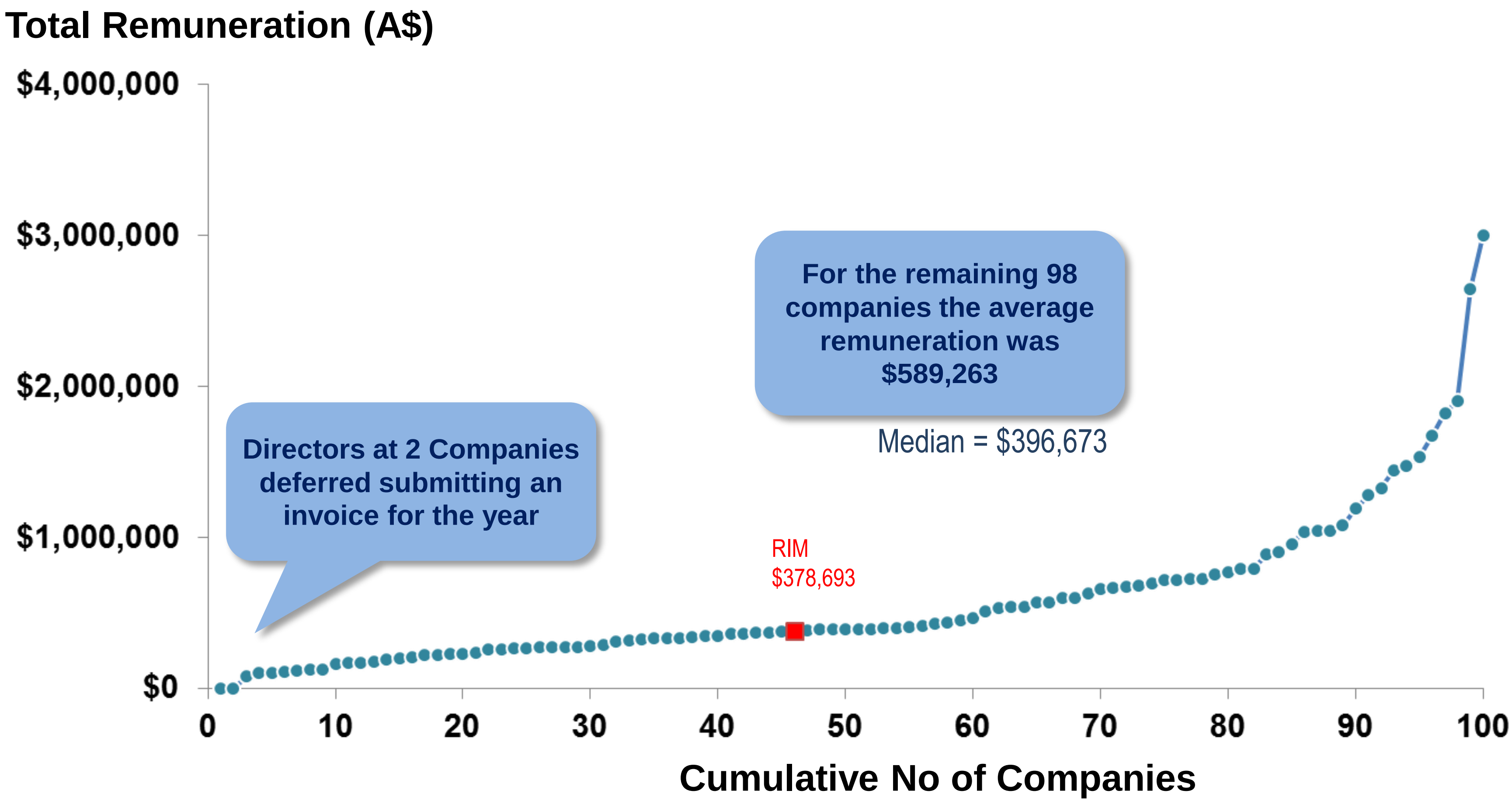
Addendum

REMUNERATION FOR DIRECTORS & KEY EXECUTIVES OF AUSTRALIAN JUNIOR EXPLORATION COMPANIES

The following analysis is based on a random sample of 100 ASX-listed junior exploration companies for the year-ending June 2015 …

Total Remuneration for Directors & Key Executives

ASX-listed Junior Exploration Companies for year ending June 2015

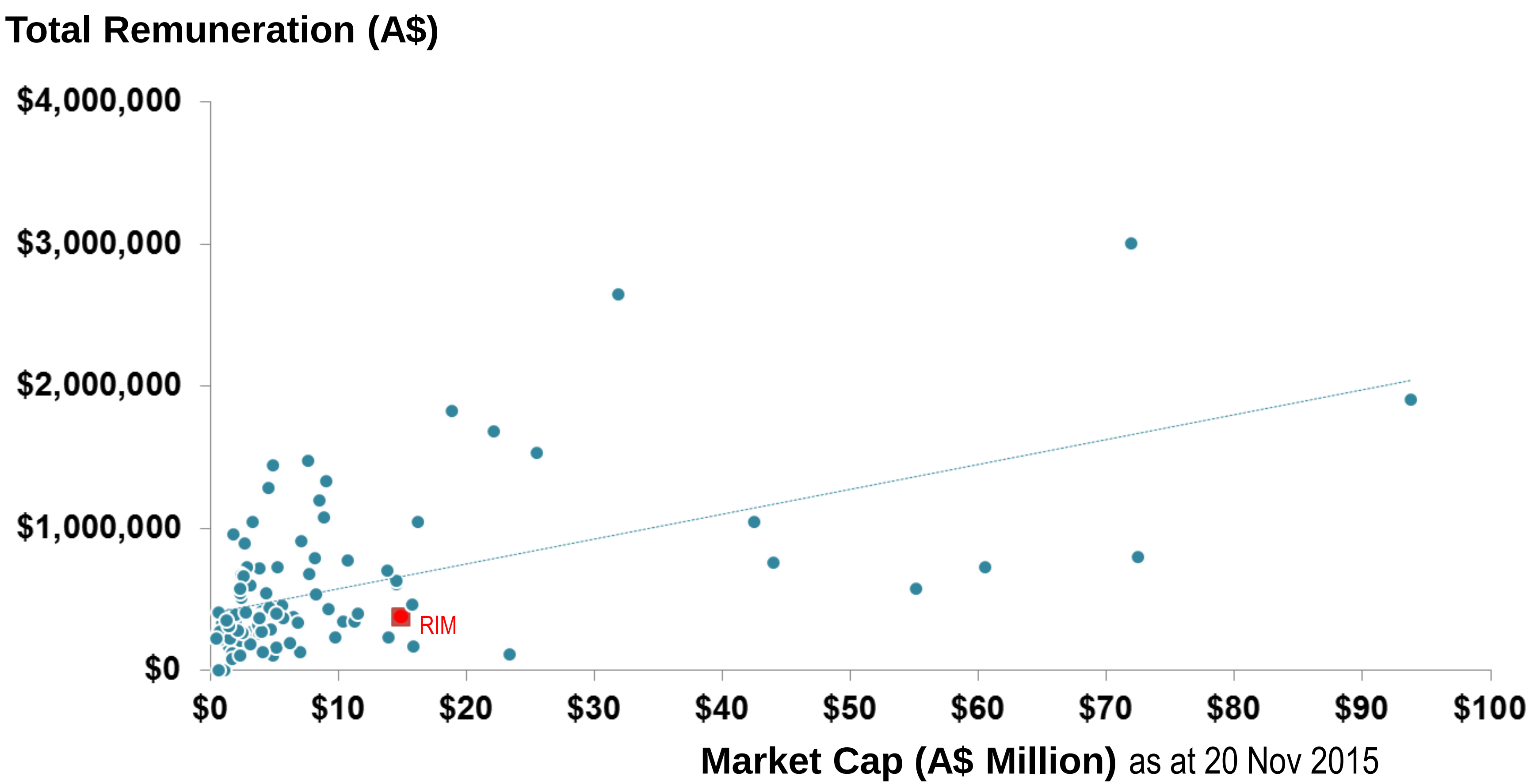


Note: Figures are based on a random sample of 100 ASX-listed Junior Exploration Companies
Remuneration includes salaries, superannuation, bonuses, share issues and other income in YE 30 June 2015

Source: MinEx Consulting © November 2015
based on Company Annual Reports

Total Remuneration for Directors & Key Executives versus Market Cap

ASX-listed Junior Exploration Companies for year ending June 2015



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