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A Simplified Classification Scheme for Lunar Resource Classification

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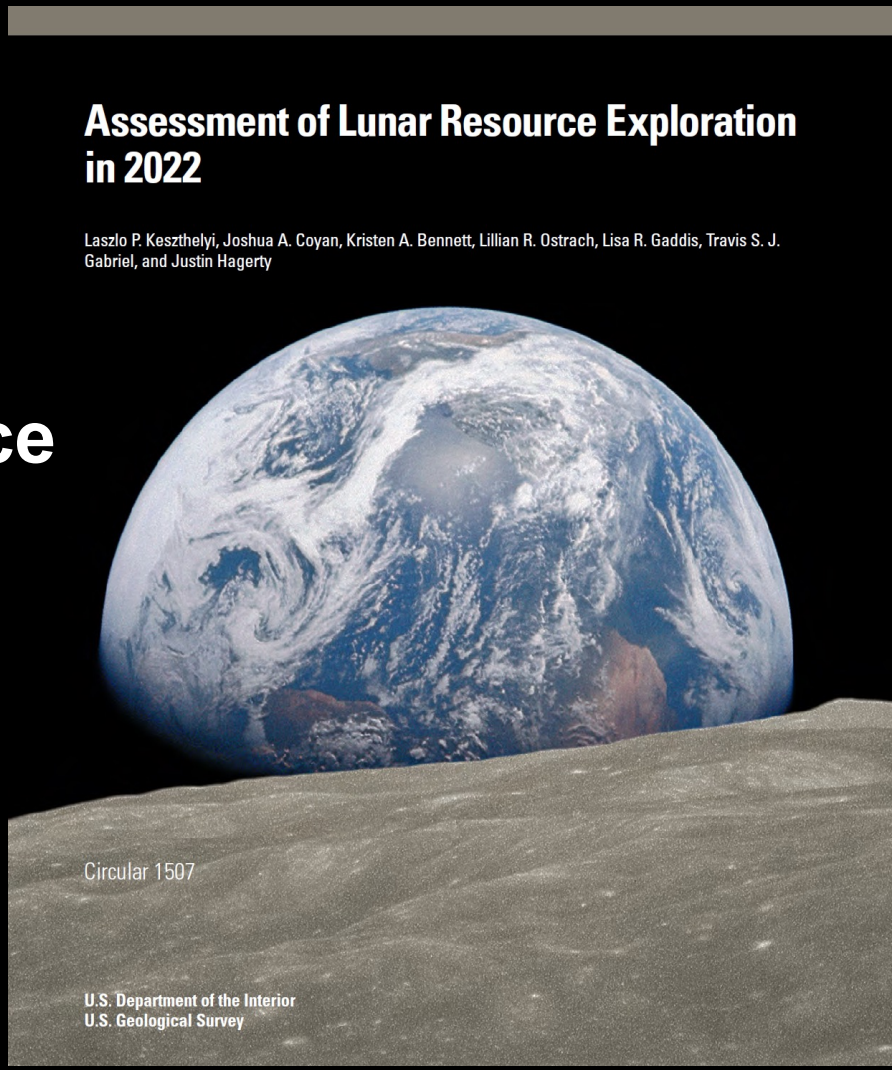
Outline

- Review Earth resource classification schemes
- Suggest a lunar resource classification scheme



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https://pubs.usgs.gov/circ/1507/cir1507.pdf

Why Does This Matter?

The lunar resource community is *very* diverse

We need a common language to bridge science, engineering, business, financial, and legal communities without misleading the public

It needs to be as intuitive as possible to as many as possible: KISS

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Just Use What We Already Have?

Inefficient to reinvent the wheel…

There is a robust working system for the Earth!

Using existing terms would aid communicating with groups that work with resources on Earth.

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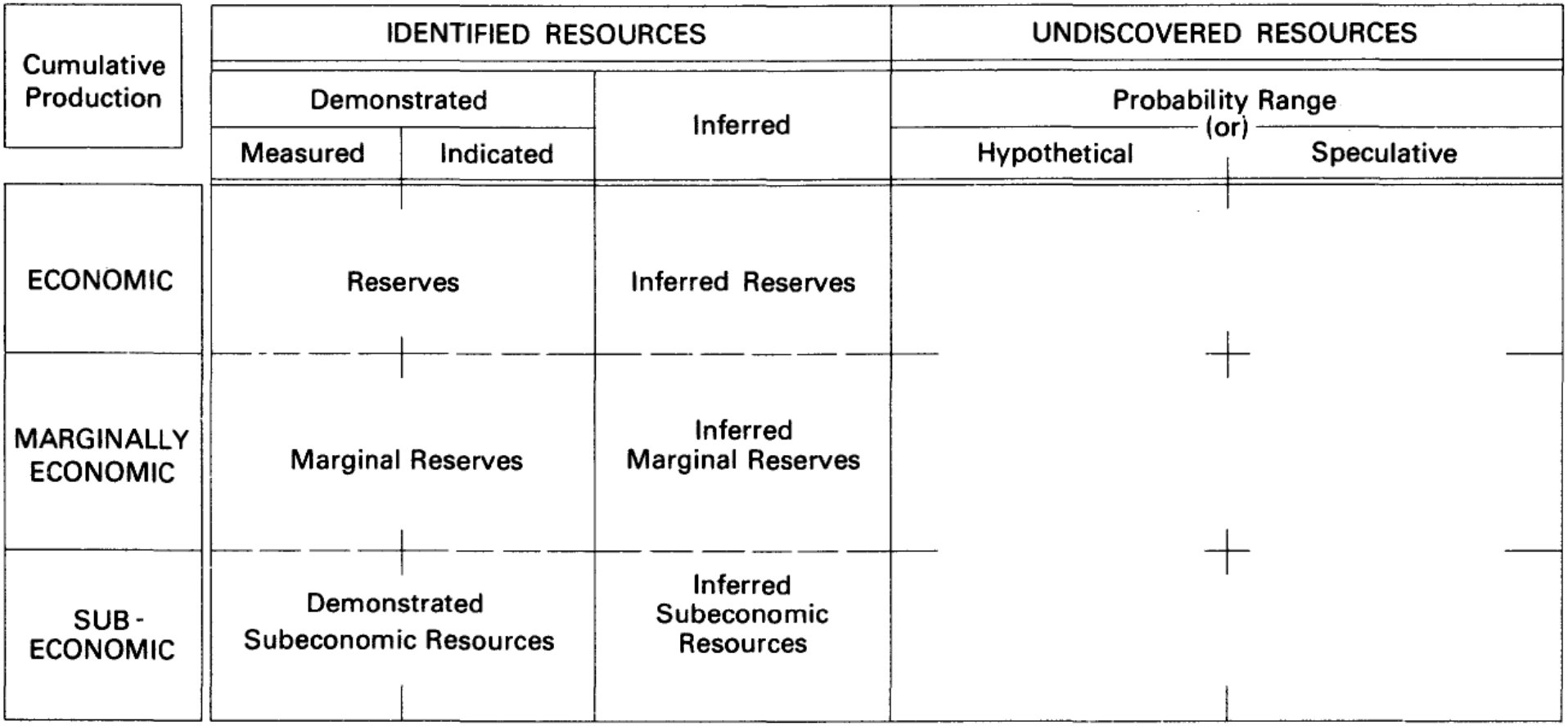
US Minerals Classifcation



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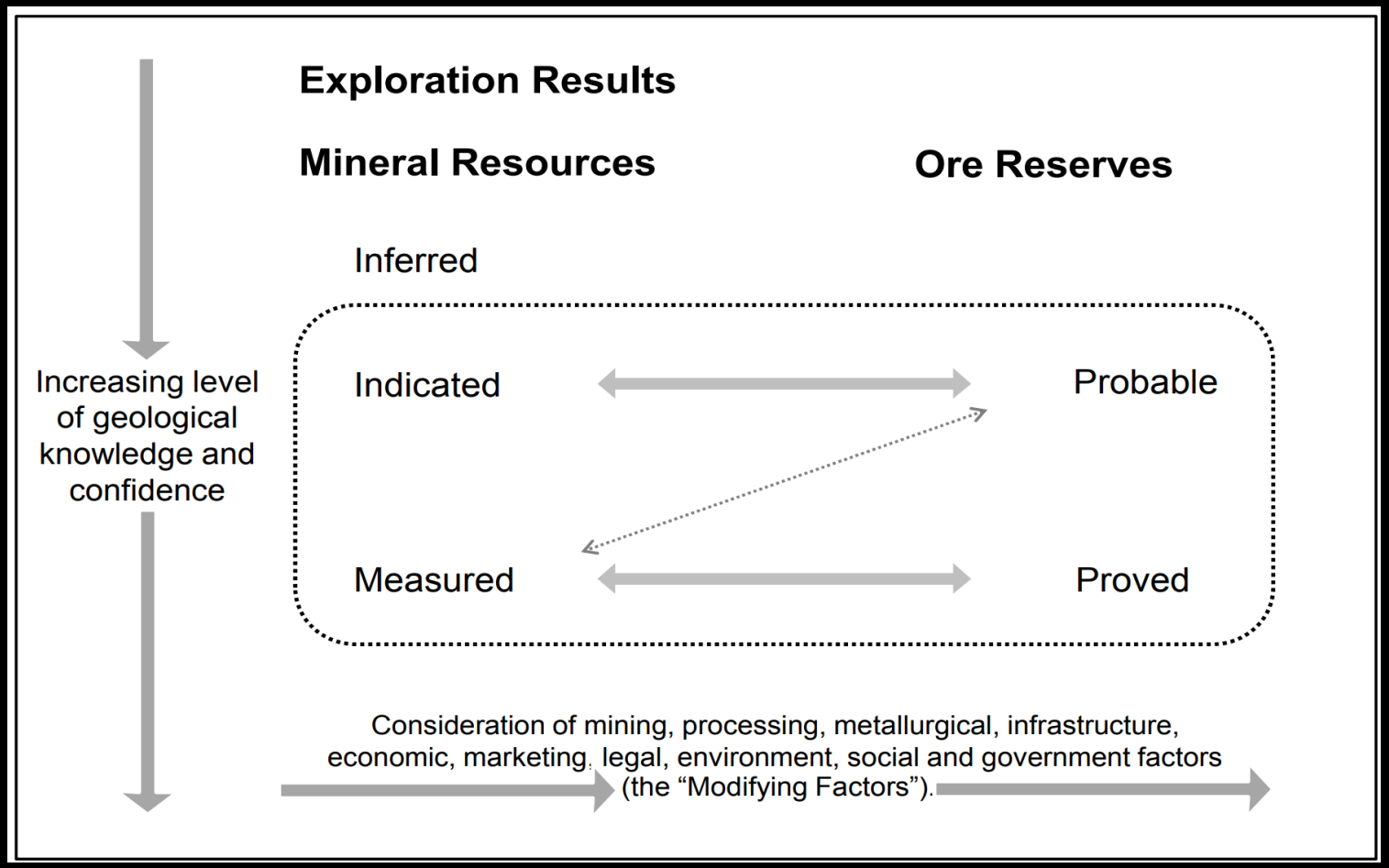
U.S. Bureau of Mines and USGS (1980) Principles of a Resource/Reserve Classification for Minerals, USGS Circular 831.

Australia



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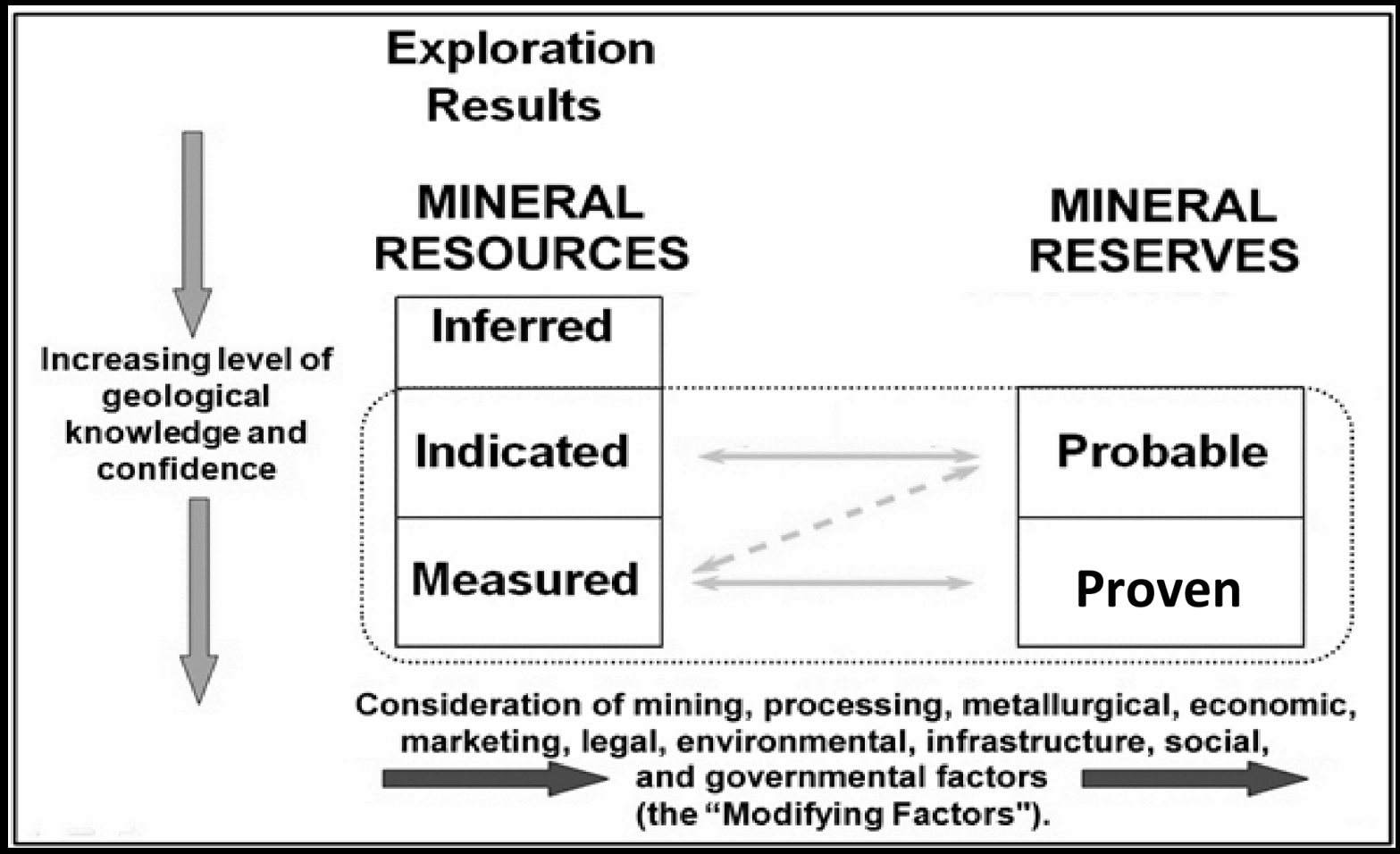
Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (2012)

Canada



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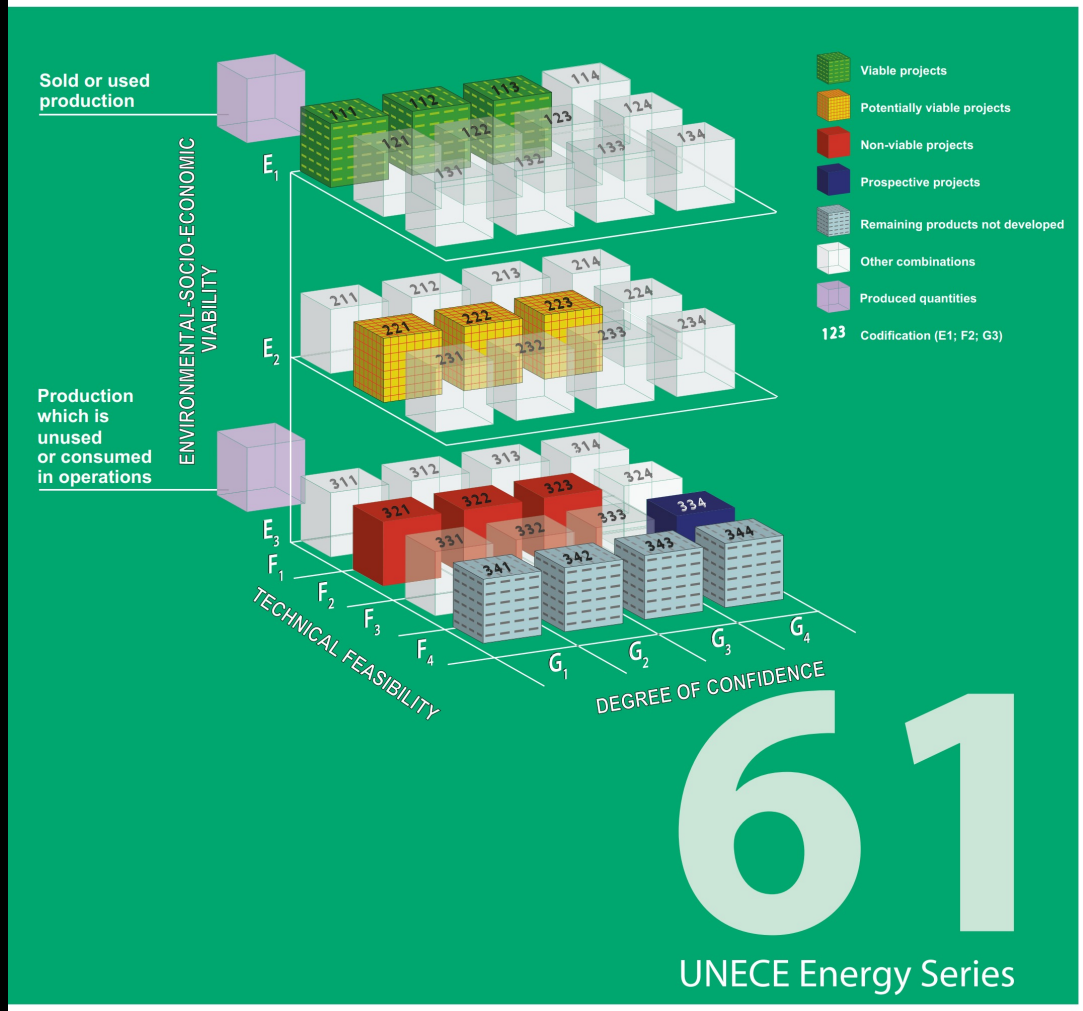
CIM Definition Standards for Mineral Resources & Mineral Reserves (2014)

United Nations Framework Classification for Resources

Update 2019



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UNECE Energy Series

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UNITED NATIONS

UN Resources

Abbreviated Version of UNFC, showing Primary Classes

Total Products	Produced	Sold or used production			
		Production which is unused or consumed in operations[a]			
		Class	Minimum Categories		
			E	F	G[b]
	The project's environmental-socio-economic viability and technical feasibility has been confirmed	Viable Projects[c]	1	1	1, 2, 3
	The project's environmental-socio-economic viability and/or technical feasibility has yet to be confirmed	Potentially Viable Projects[d]	2[e]	2	1, 2, 3
		Non-Viable Projects[f]	3	2	1, 2, 3
	Remaining products not developed from identified projects[g]		3	4	1, 2, 3
	There is insufficient information on the source to assess the project's environmental-socio-economic viability and technical feasibility	Prospective Projects	3	3	4
	Remaining products not developed from prospective projects[g]		3	4	4

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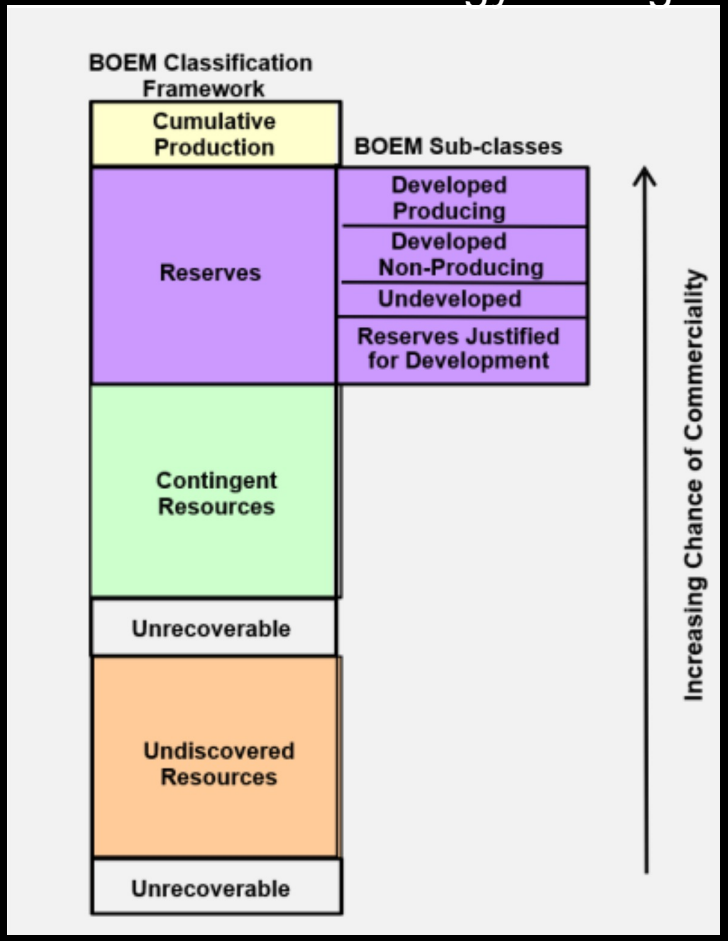
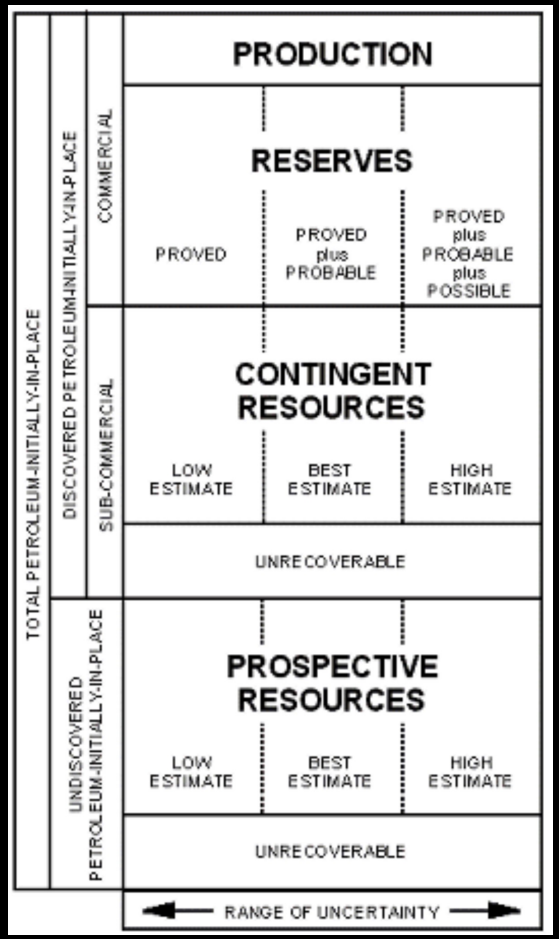
US Energy Resources

Bureau of Ocean Energy Management



BOEM website

Society of Petroleum Engineers



SPE website

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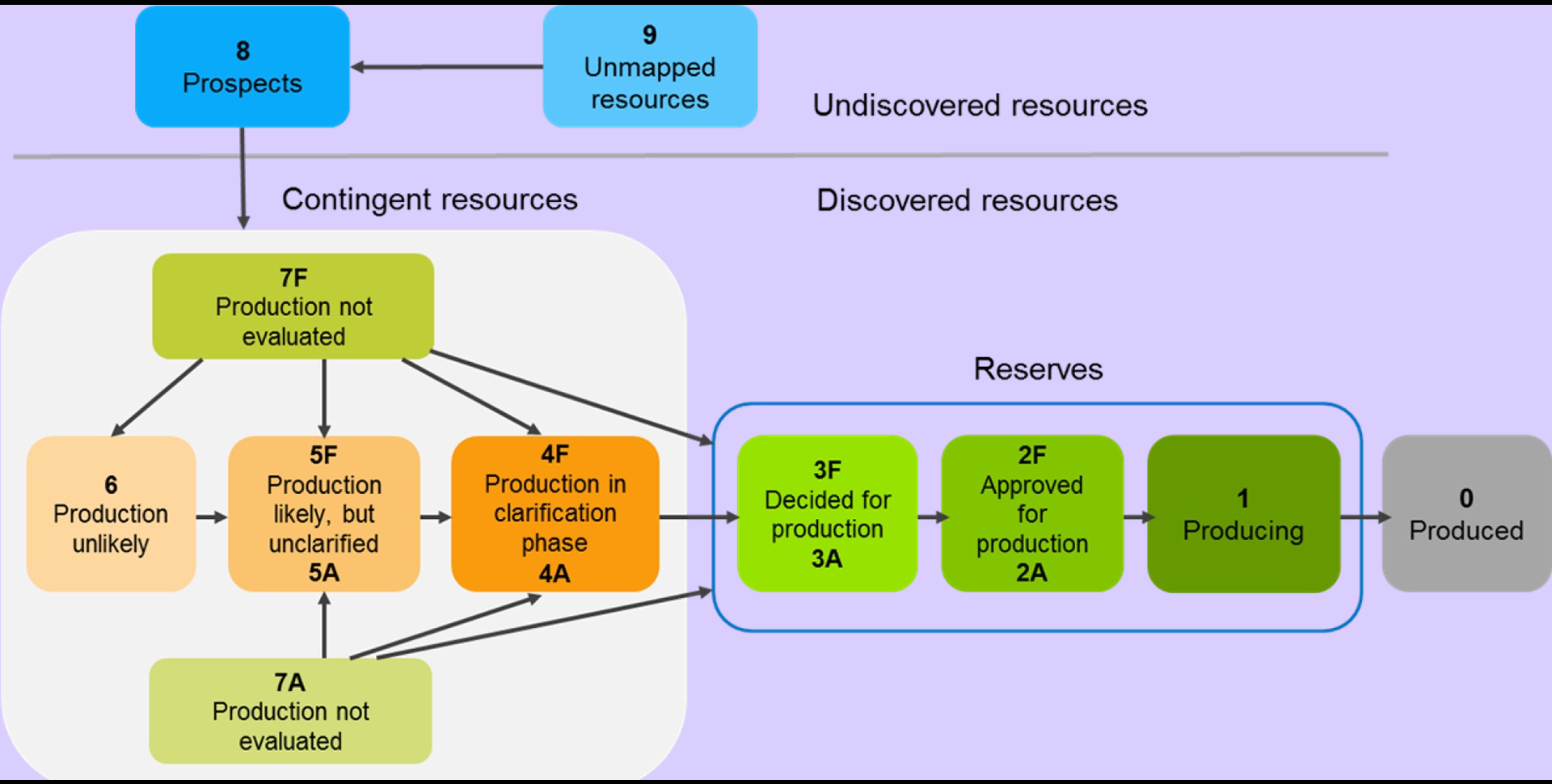
Norwegian Energy Resources



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Norsk Website

Timeframe matters...

U.S. Geological Survey Assessment Concepts for Conventional Petroleum Accumulations

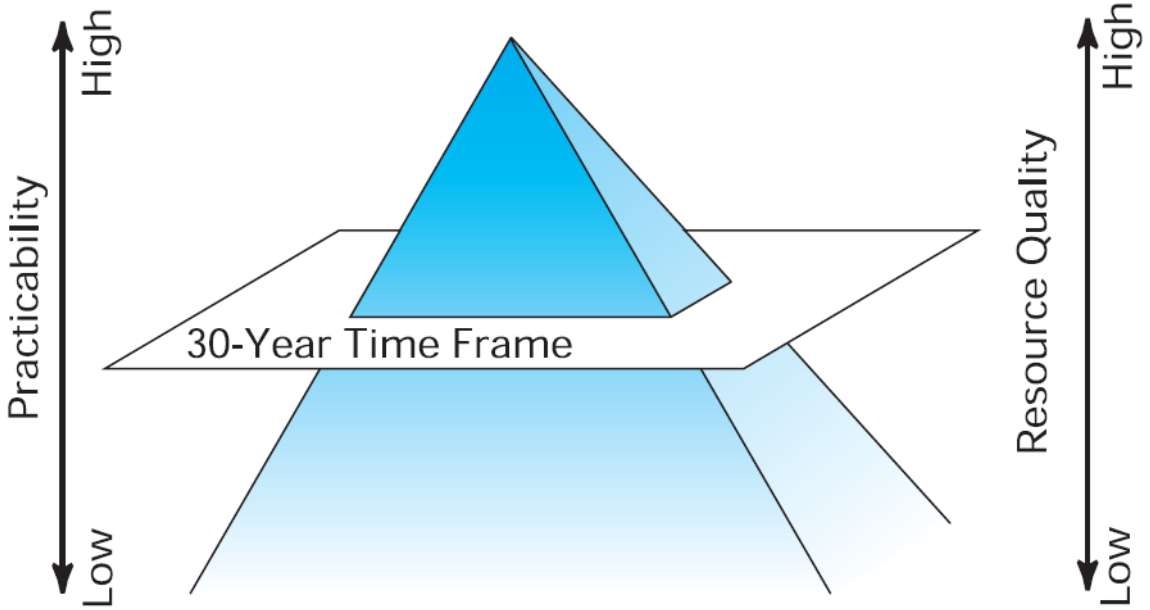

Figure 1. Sketch depicting a 30-year resource-assessment forecast span as a slice through the conventional-accumulation resource pyramid at some quality level. Accumulation categories below the selected slice level are excluded from assessment consideration. (Modified from McCabe, 1998.)

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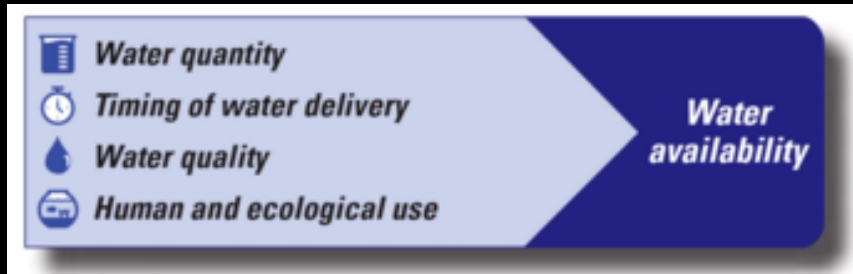
Schmoker and Klett (2005) USGS Digital Data Series DDS-69-D

Water: seasons also matter

National Integrated Water Availability Assessments

labs.waterdata.usgs.gov/estimated-availability



Can’t just use what we have...

Each type of resource has developed its own terminology

Terms are often directly tied to the laws or regulations of individual countries

...but perhaps we can generalize and simplify from what we have...?

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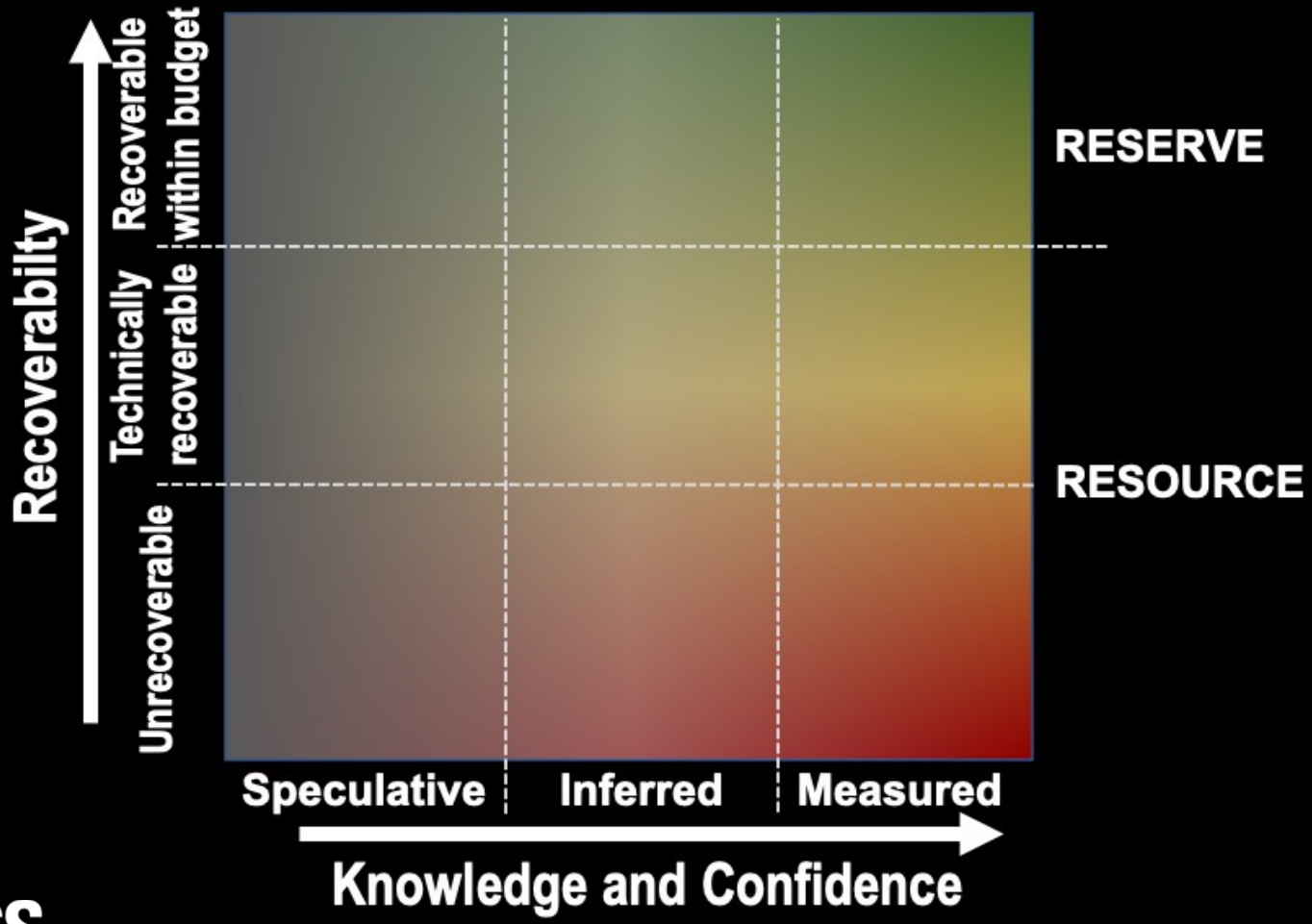
Suggested Classification



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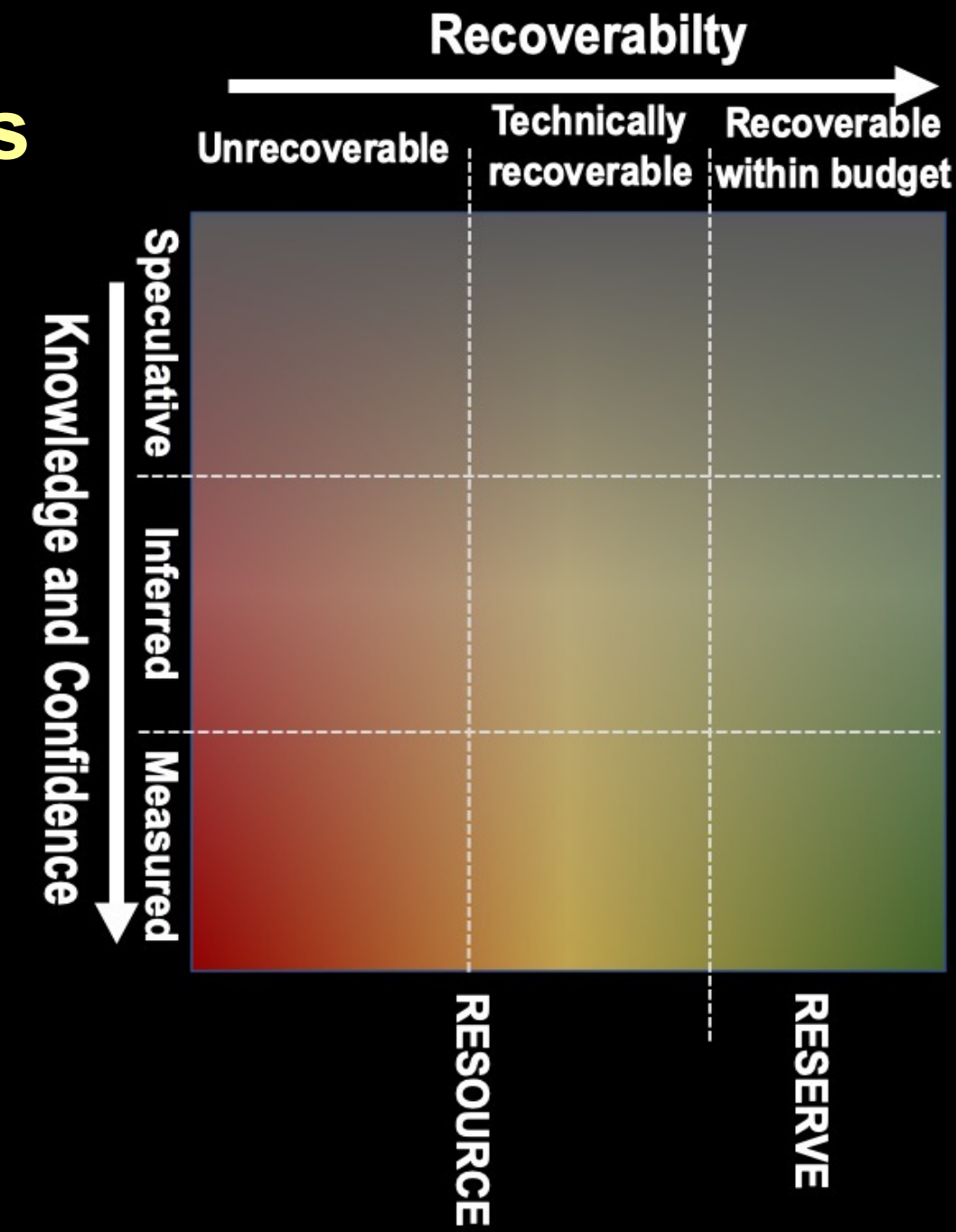
Minerals



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NASA Risk

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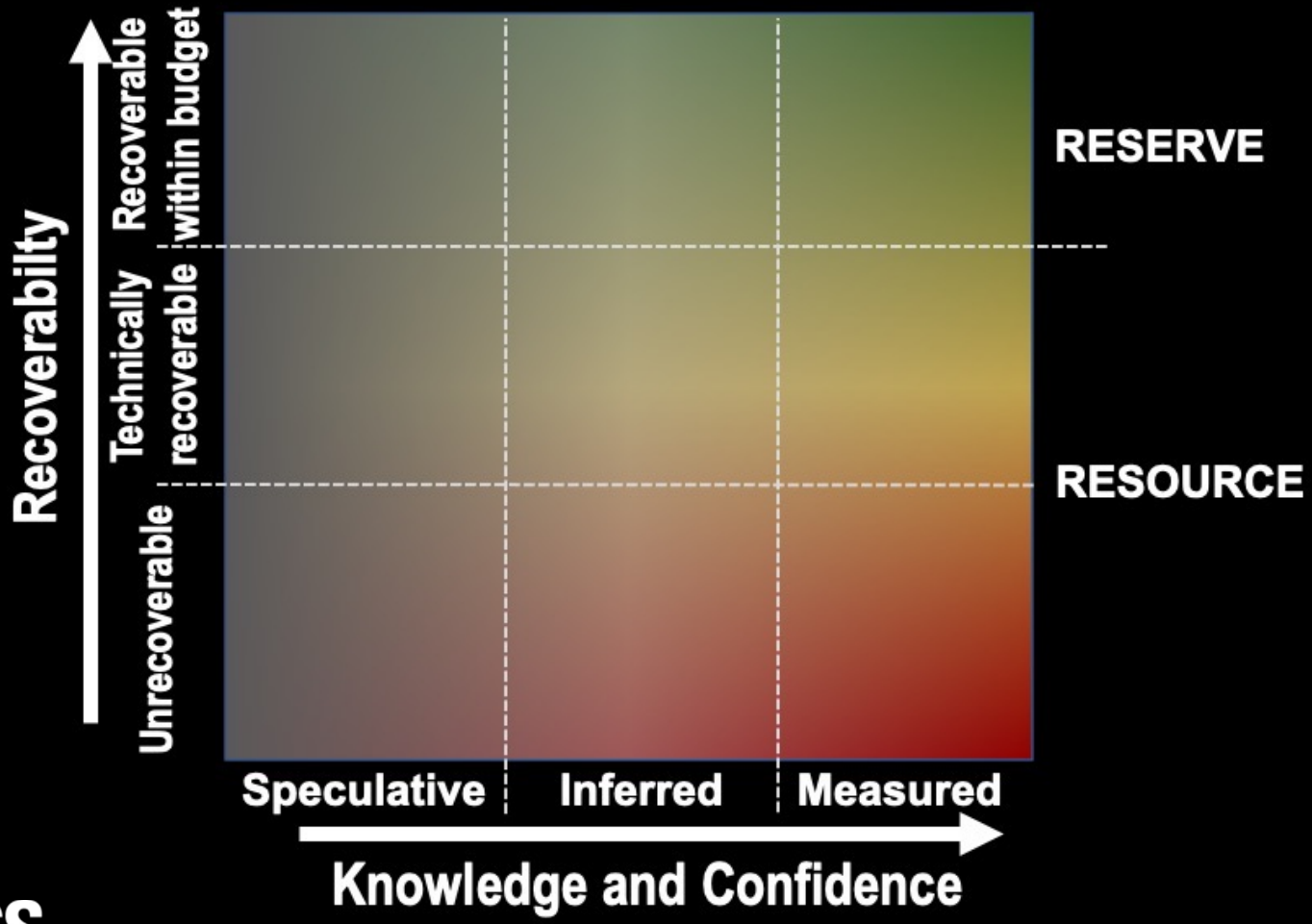
Suggested Classification



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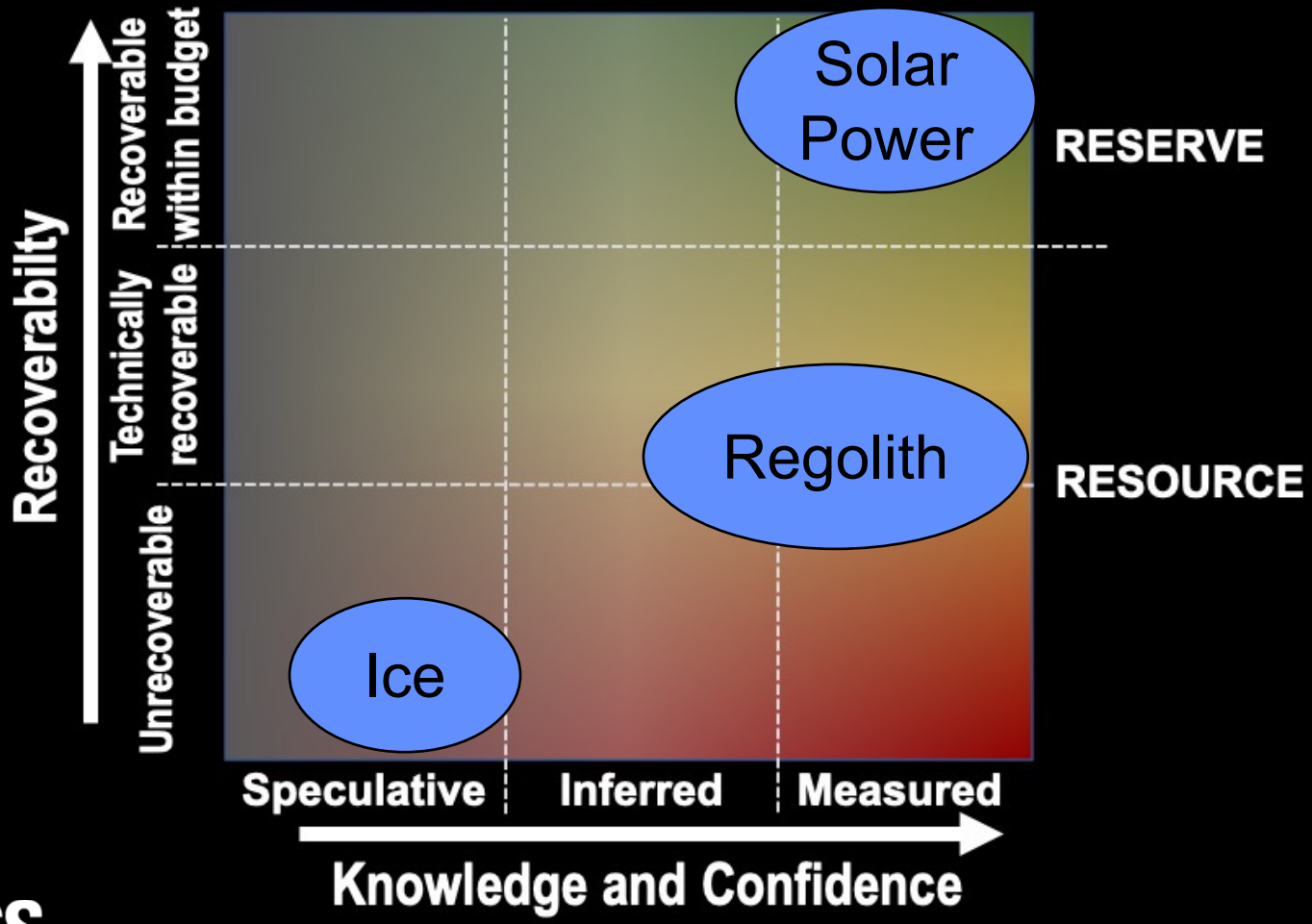
A Few Example Resources



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Summary

- Suggested scheme is probably the simplest that can be useful
- It is generic
- It tries to use terms that the general public should be able to understand but does not contradict expert-speak
- Easy to adjust for different audiences (spin the box)

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