Writing an Effective Plain Language Summary

AGU ADVANCING EARTH AND SPACE SCIENCE

A Plain Language Summary (PLS) is a way to summarize a scientific study and its results in terms that are accessible to people outside of a specific scientific circle. The example below, taken from a research article published in *Geochemistry, Geophysics, Geosystems* , is broken down to show the four key elements that make an effective PLS and how the language from an Abstract can be modified for a Plain Language Summary.

Example from Geochemistry

	ABSTRACT		PLAIN LANGUAGE SUMMARY
Topic overview	Results from the first focused heat flow study on the U.S. Beaufort Margin provide insight into decadal-scale Arctic Ocean temperature change and raise new questions regarding Beaufort Margin evolution.	**What does a non-expert reader need to know about the topic to understand your paper?** • Provides information to contextualize the area of study for readers with limited background knowledge of the subject • Explains the importance of the topic • Accessible to a non-expert	The Arctic Ocean represents one of the last geological frontiers on Earth. The formation of the Arctic Ocean remains unclear, and although it is well understood that the Arctic surface temperature is warming at a rate approximately twice as fast as the rest of the Earth, it is unclear how deep Arctic Ocean temperatures are changing. Understanding whether deep Arctic Ocean water is warming is important, since it can lead to the breakdown and release of huge quantities of frozen methane molecules trapped below the Arctic seafloor, which can increase ocean acidity and destabilize the seafloor.
Paper overview	This study measured heat flow using a 3.5-m Lister probe at 103 sites oriented along four north-south transects perpendicular to the ~700-km long U.S. Beaufort Margin.	**What did you set out to investigate?** • Explains what the study aims to do • Describes where the data come from	To understand both Arctic Ocean temperature change and geologic evolution, we collected temperature measurements at 103 sites. These measurements tell us how temperature increases with depth below the seafloor and can be used to understand both ocean temperature change and regional geology.
Paper findings	The new heat flow measurements, corrected both for seasonal ocean temperature fluctuations and bathymetric effects, reveal low average heat flow values (~35 mW/m2) at seafloor depths of 300–900 m below sea level (mbsl) and anomalously high (~80 mW/m2) values at seafloor depths of >1,000 mbsl, near the predicted continent-ocean transition. Anomalously low heat flow values measured on the upper margin are consistent with previous studies suggesting decadal-scale ocean temperature warming to ~500 mbsl. Our results, however, indicate this ocean warming likely extends to depths as great at 900 mbsl—400 m deeper than previous studies suggest—implying widespread, ongoing, methane hydrate destabilization across much of the U.S. Beaufort Margin.	**What was the most significant result or conclusion in your paper?** • Gives a general picture of the results • Indicates why the findings are significant	Analysis of our data shows that at depths of 300–900 m below sea level, the Arctic Ocean has been warming steadily for perhaps several decades—nearly twice as deep as previous studies suggest. However, at the same two sites, the addition of iButtons significantly reduced root mean square error and bias compared to other methods.
Key takeaways	The cause of the anomalously high heat flow values observed at seafloor depths >1,000 at the continent-ocean transition is unclear. We suggest three candidate processes: (1) higher heat production and lower thermal conductivity on the margin edge due to the thickest sedimentary cover at the ocean-continent transition, (2) seaward migrating subsurface advection, and (3) possible fault-reactivation at the northern boundary of the Alaskan Microplate.	**Why should a reader care about your findings?** • Identifies needs for further research	The cause of these significant increases is unclear.

Hornbach, M. J., Harris, R. N., & Phrampus, B. J. (2020). “Heat flow on the U.S. Beaufort Margin, Arctic Ocean: Implications for ocean warming, methane hydrate stability, and regional tectonics.” *Geochemistry, Geophysics, Geosystems*, 21, e2020GC008933. https://doi.org/10.1029/2020GC008933

More resources about Plain Language Summaries available at agu.org/Publish-with-AGU/Publish/Author-Resources/Plain-Language-Summary