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Confirmed
Meeting: GSA Annual Meeting in Denver, Colorado, USA – **25-28 Sep 2016**
Session Type: Topical Sessions
Primary Selection: T185. Autogenic and Allogenic Controls and Morphodynamic Responses of Large Fluvial Fans (Fluvial Megafans)
Final Session Number:

Abstract Title: MEGAFANS—SOME NEW PERSPECTIVES FROM A GLOBAL STUDY
Preferred Presentation Format: Oral
Discipline Categories: Geomorphology Sediments, Clastic
Abstract Submission Fee: Paid (gsa-2016AM-7307-2001-9703-9159)

Presenting Author M. Justin Wilkinson
Texas State University
NASA/Johnson Space Center
601 University Drive
Geography Dept.
San Marcos, TX 78666

Phone Number: 281-483-5159 281-483-5159
Email: justin.wilkinson-1@nasa.gov
Student? N

T185. Autogenic and Allogenic Controls and Morphodynamic Responses of Large Fluvial Fans (Fluvial Megafans)

Jianqiao Wang, Andrew Leier
SEPM (Society for Sedimentary Geology); GSA Sedimentary Geology Division

Your confirmation number is: gsa-2016AM-7307-2001-9703-9159.
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MEGAFANS—SOME NEW PERSPECTIVES FROM A GLOBAL STUDY

WILKINSON, M. Justin, Geography Dept., Texas State University, NASA/Johnson Space Center, 601 University Drive, San Marcos, TX 78666, justin.wilkinson-1@nasa.gov
A global study of megafans (>100 km long) has revealed their widespread existence on all continents, with almost 200 documented, 93 in Africa where research is most thorough. The largest measures 705 km. Megafans are a major subset of “DFS” (distributive fluvial systems, a category that includes all fan-like features >30 km long).

1. Many researchers now recognize megafans as different from floodplains, small coarse-grained alluvial fans, and deltas. Although smaller architectural elements in megafans are the

same as those encountered in floodplains (channel, overbank, etc.), larger architectures differ because of the unconfined setting of megafans, versus the valley-confined setting of floodplains.

2. A length continuum is now documented between steep alluvial fans 10-20 km in length, and fluvial fans 30-50 km long. This implies a continuum of process from end-member alluvial fan processes (e.g. high-energy flows that emplace gravels, debris-flow units) to the relatively fine-grained channel and overbank deposits common to purely fluvial fans. *Combinations* of these different processes will then occur in many mid-sized fans.

3. The global distribution suggests a prima facie relationship with tectonic environment rather than climatic zones, with local controls being the slope of the formative river and the existence of a basin subsiding below the long profile of the river. But the global population has revealed that most megafans are relict. So it is possible that further research will show relationships to prior climatic regimes.

4. Megafans can have regional importance: e.g., along the east flank of the central Andes, nested megafans total ~750,000 km2—and 1.2m km2 if all megafans in S. America are counted. Modern megafan landscapes thus have basinal importance, orders of magnitude greater than alluvial fan bajadas.

5. Because so many aggrading basins are dominated today by DFS, it is claimed that DFS ought to be significant in the subsurface; and that existing fluvial models therefore may not apply to the majority of fluvial sedimentary units. Arguments have been raised against this view, but as modern megafan systems become better known they are rapidly being applied as a model in many fluvial basins. A small literature has arisen with apparent examples from every part of the world.

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Presenting Author
M. Justin Wilkinson
Texas State University
NASA/Johnson Space Center
601 University Drive
Geography Dept.
San Marcos, TX 78666

Phone Number: 281-483-5159281-483-5159
Email: justin.wilkinson-1@nasa.gov
Student? N

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Megafans—some new perspectives from a global study

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