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Eric Kuhn

ERIC KUHN AND JOHN FLECK

SCIENCE BE DAMMED

How Ignoring Inconvenient Science
Drained the Colorado River



COLORADO RIVER BASIN

HEARINGS

BEFORE THE

COMMITTEE ON IRRIGATION AND RECLAMATION

UNITED STATES SENATE

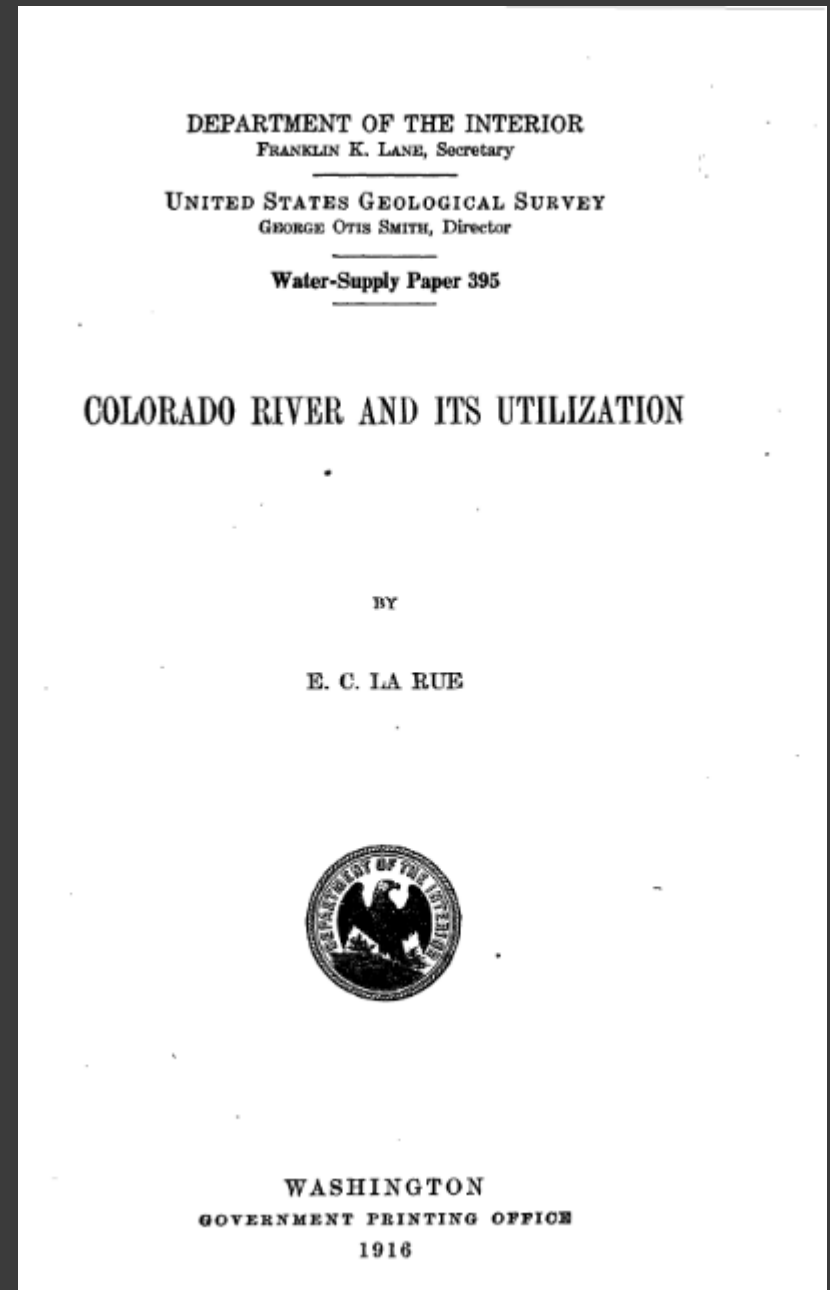
SIXTY-NINTH CONGRESS

“The flow of Colorado River and its tributaries is not sufficient....”

– Eugene Clyde LaRue, to the U.S. Senate Committee on Irrigation and Reclamation, December 1925

1916 – six years
before the
Compact

E.C. LaRue's first
attempt to go
beyond the
gauge record





“The flow of the Colorado River and its tributaries is not sufficient to irrigate all the irrigable lands lying within the basin.”

- E.C. LaRue, USGS Water Supply Paper 395, 1916

**“sufficient water for the irrigation of
all the lands”**

– A.P. Davis, 1922



investigations had reached a point where I felt confident that with proper and sufficient conservation which was thought advisable there would be sufficient water for the irrigation of all the lands that could be favorably reached from the standpoint of economics within or adjacent to the Colorado Basin, not only by gravity but by reason-

**Arthur Powell Davis, director, U.S.
Reclamation Service, first meeting of the
Colorado River Compact Commission, Jan.
26, 1922**

DEPARTMENT OF THE INTERIOR
Hubert Work, Secretary

U. S. GEOLOGICAL SURVEY
George Otis Smith, Director

Water-Supply Paper 556

WATER POWER AND FLOOD CONTROL
OF
COLORADO RIVER BELOW GREEN RIVER, UTAH

BY

E. C. LARUE

WITH A FOREWORD BY
HUBERT WORK
SECRETARY OF THE INTERIOR

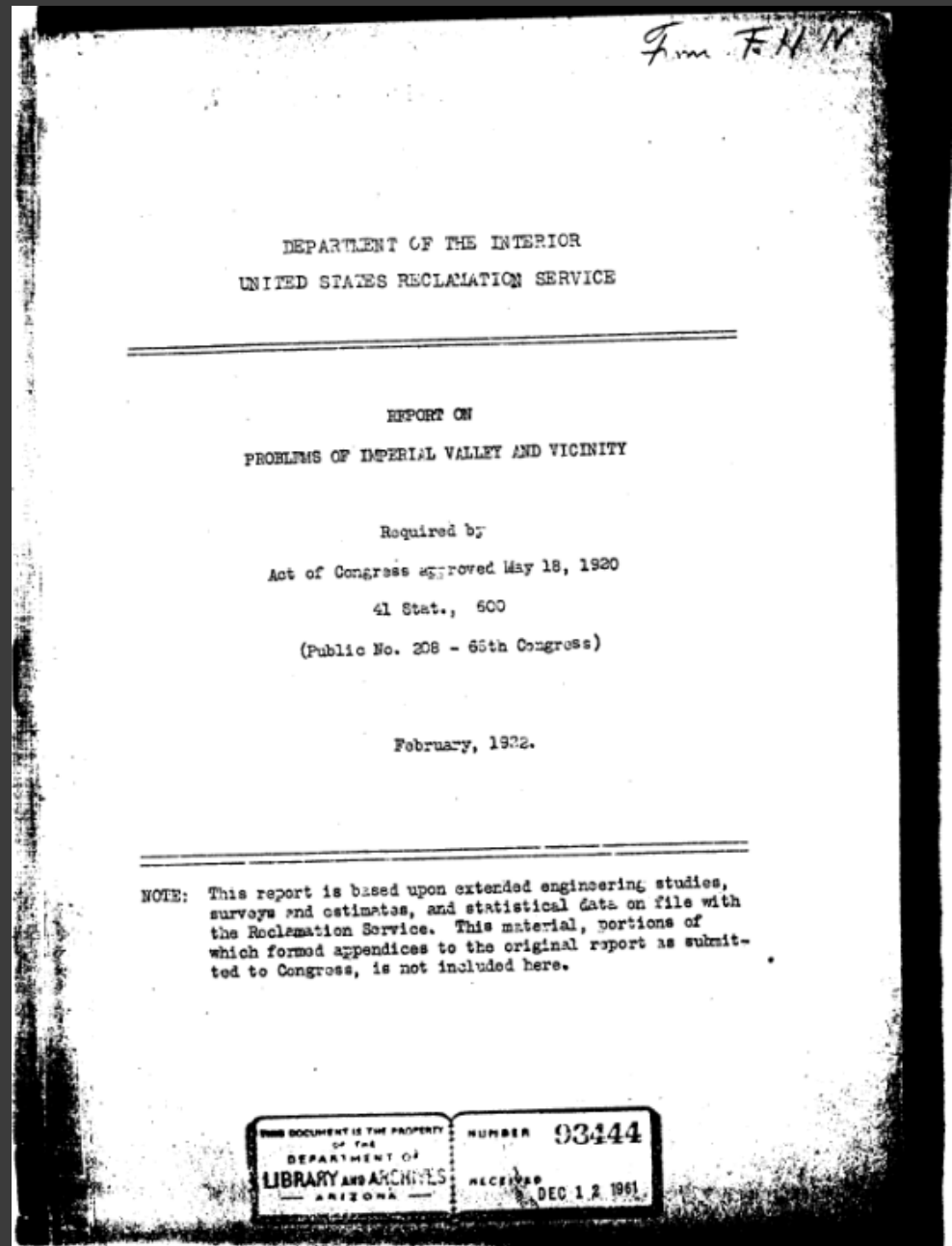


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WASHINGTON
GOVERNMENT PRINTING OFFICE
1925

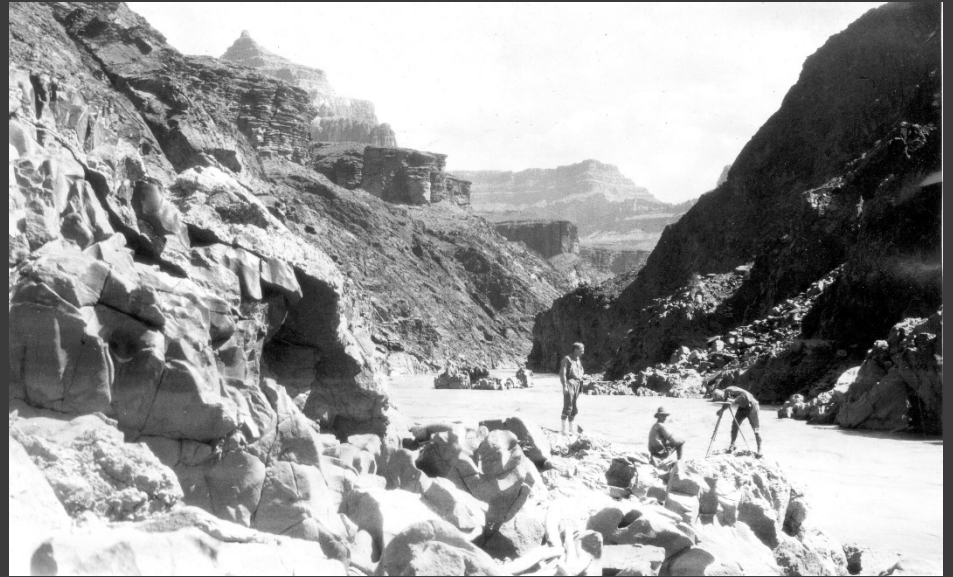
The numbers used to negotiate the Colorado River Compact – the “Fall-Davis Report”

- Measurement at Laguna Dam
- Period of record **1899-1920**
- Used actual measured flow, without accounting for upstream diversions



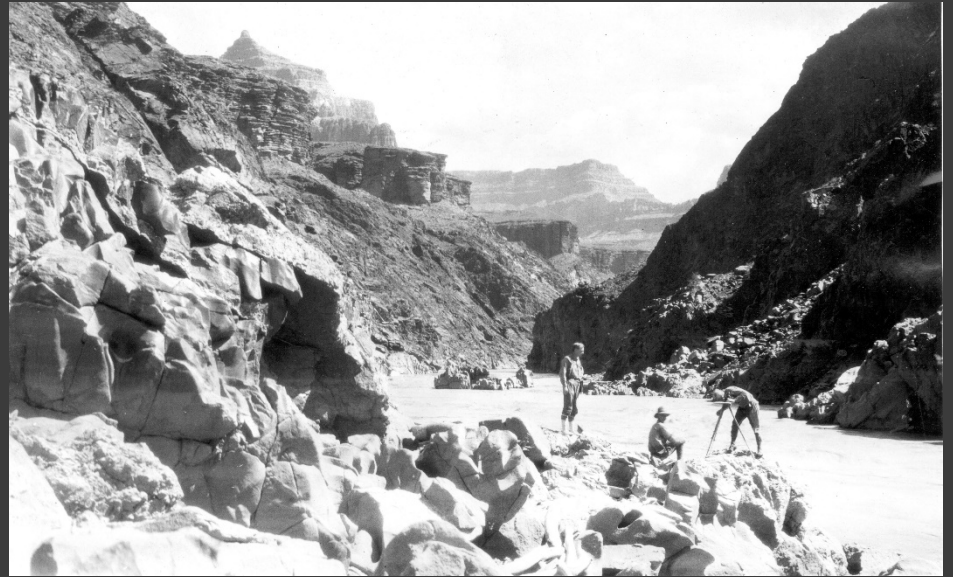
**Herman
Stabler,
USGS, 1923**

**Uses river
stage
measurements
at the Yuma
railroad bridge
to estimate
actual flows
1878 - 1920**



Herman Stabler,
USGS, 1923

Stabler's numbers
suggest an
average annual
flow of **14.3 maf**



E.C. LaRue, USGS, 1925

- Corrects for changes in upstream depletions over time
- Uses Great Salt Lake as a proxy to extend record back in time
- 1875 - 1922

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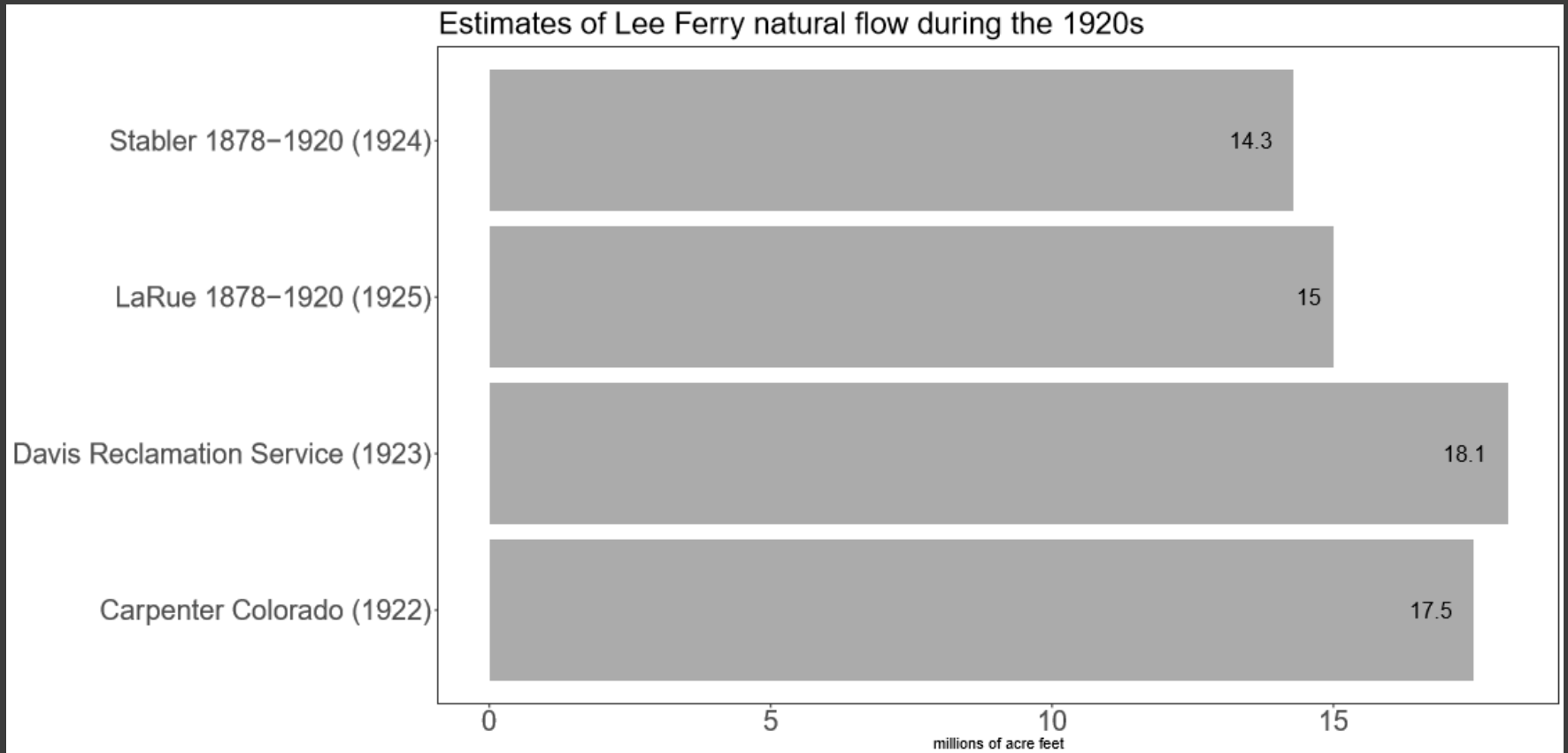
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Kuhn and Fleck, *Science be Dammed*

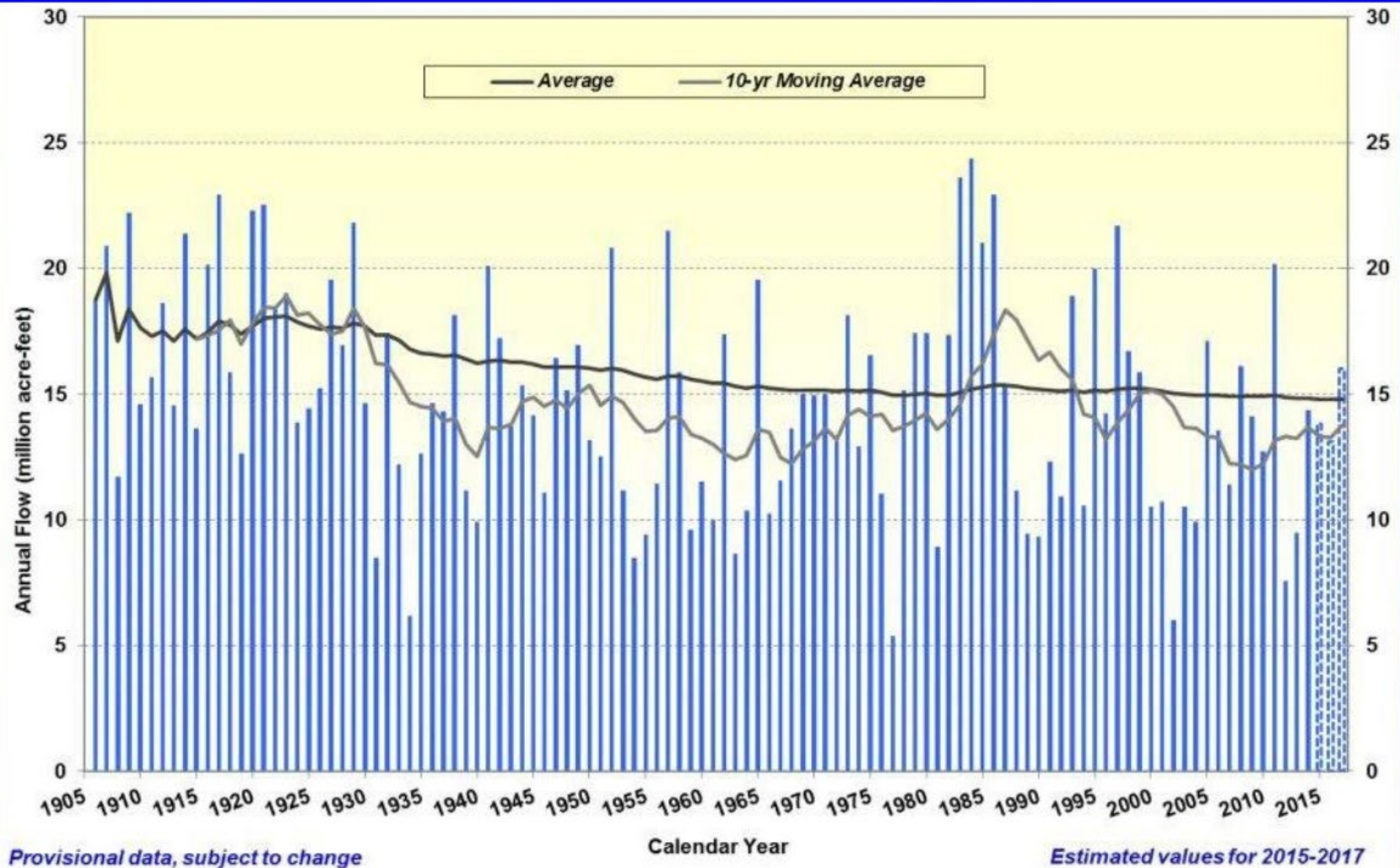
The first “natural flow” calculation

- **18.1** million acre feet at Lee Ferry
- Arthur Powell Davis, 1923
- Period of record:
1903 - 1920



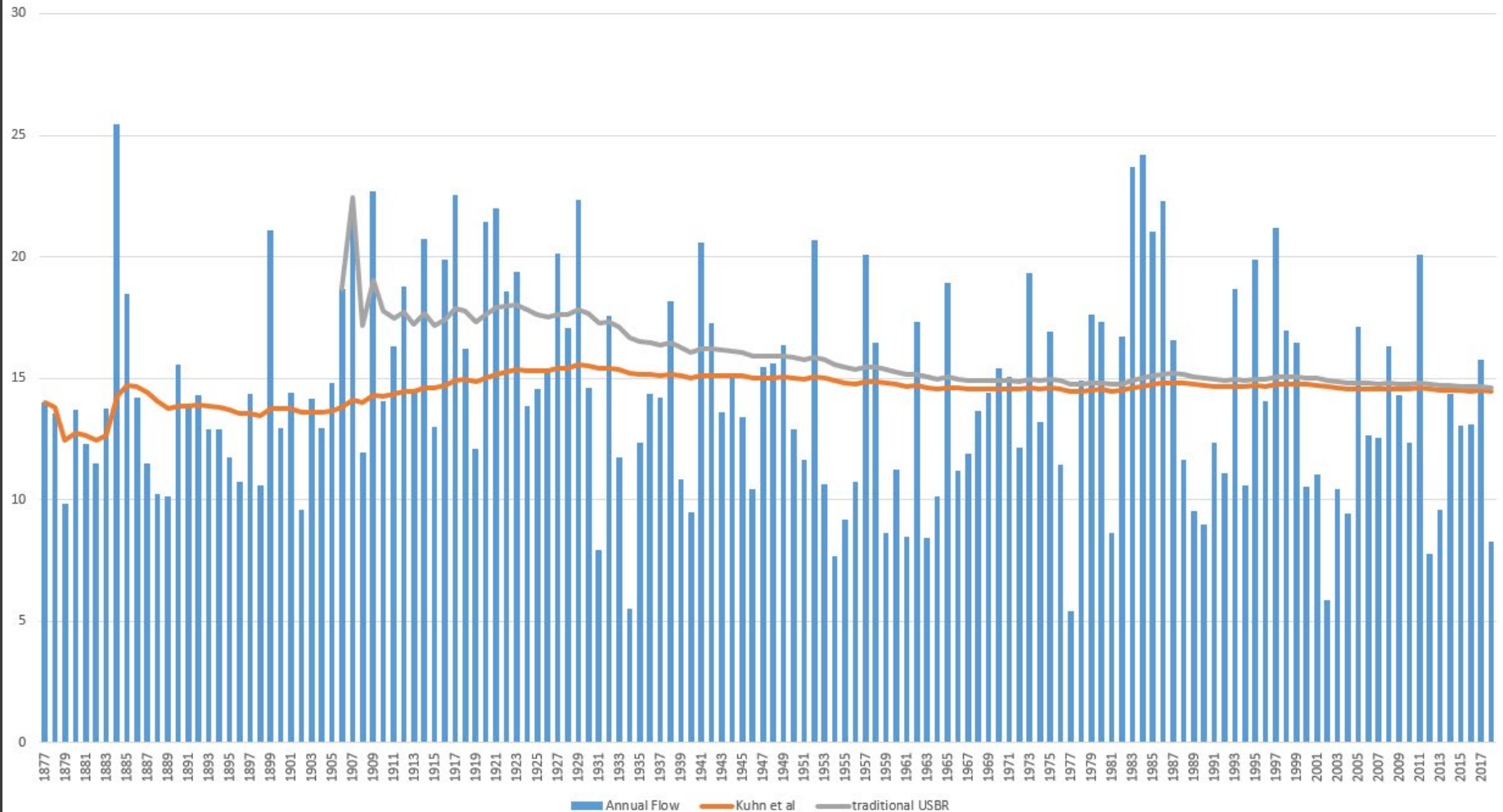
Natural Flow

Colorado River at Lees Ferry Gaging Station, AZ



The Colorado River: the traditional view

An Alternative Visualization



Kuhn, Fleck, Udall, Kanzer, Science Be Dammed Working Paper 2019-01

IMPORTANT MESSAGES FOR TODAY

- Inequities Between the Two Basins – LB Uses >10 MAF, UB Uses about 4.5 MAF, With fixed obligations @ Lee Ferry the UB has most of the risk of climate change
- Many of the Disputed Compact Issues from the 50s, 60s, & 70s were never resolved – Have they been forgotten?
- UB's Mexican Treaty delivery, How Apportionments are Measured, LB Tributary Uses (LB Compact), LB Reservoir Evaporation, the Meaning of Articles III(a) & (b). Native American Rights
- For the post 2026 River Management Guidelines, will these unresolved issues be forgotten or will they be resolved?