RESSED

THE NATIONAL RESERVOIR SEDIMENTATION DATABASE

OF THE

FEDERAL INTERAGENCY SUBCOMMITTEE ON SEDIMENTATION
Advisory Committee on Water Information

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USGS Office of Surface Water, Reston, VA
With the SOS RESSED Workgroup
Jerry Webb, COE; Jerry Bernard, NRCS; Tim Randle, BR

http://ida.water.usgs.gov/ressed/

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Overview of Presentation

- Overview of ACWI-SOS RESSED project, 2009-10
- Description of RESSED Database and Website
- RESSED issues/problems
- Big Picture/Long Term Goals

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COE-USGS RESSED Project

- Render static RESSED Database updatable on-line by any “certified” user
- Include info from the 2008 COE “Data Call”
- “Push” data to COE Oracle database/CorpMap
- Provide capability to produce reports useful to the COE and others
- “Modern” schema and use of FilemakerPro database (flexible) software renders product useful for present and future applications.

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COE-USGS RESSED Project

- Funded by the COE/Water Resources Institute; support arranged by Jerry Webb
- COE team: Jerry Webb, Meg Jonas, John Remus, Mike Smith, James Stinson
- USGS team: John Gray, Jerry McFaul, Jenifer Bracewell, Kevin Laurent, Dave Stewart
- Functional Product by July 2010

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What Is RESSED?

- SCS database, initiated ~1953
- Changes in capacities are computed from bathymetric data (+/- acre feet/year)
- 1,824 reservoirs, 6,618 surveys, lower US, 1:PR
- Based on Soil Conservation Service Form 34
- ?Presumed to be largest such database for US?

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Very Brief History

- SCS Form 34 developed in 1953
- Results published in at least 3 summary reports: through 1953; through 1975; 1981-1985
- 1993: An unmarked magnetic tape is found in a box by NRCS – Presumed all Form 34 data
- USGS ports data iteratively to MS Access, uses data as part of carbon cycle budget research

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WICP Water Information Coordination Program
ACWI Advisory Committee on Water Information

RESSED – Subcommittee on Sedimentation

Subcommittee on Sedimentation

The Reservoir Sedimentation Database (RESSED)

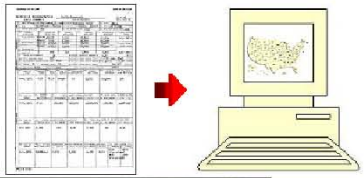
- WELCOME
- PURPOSE AND SCOPE
- BACKGROUND
- DATA SOURCES AND DATA QUALITY
- DATABASE DOWNLOAD AND DOCUMENTATION
- INTERACTIVE MAP
- LIST OF RESERVOIRS
- ENHANCEMENT AND EXPANSION
- UPDATING RESSED - INTERIM GUIDELINES
- ACKNOWLEDGEMENTS
- SELECTED REFERENCES
- ACRONYMS
- CONTACT

WELCOME TO THE RESERVOIR SEDIMENTATION (RESSED) DATABASE

The Advisory Committee on Water Information, Subcommittee on Sedimentation's Reservoir Sedimentation (RESSED) database enables access to sedimentation-survey data for selected United States reservoirs. These data or their visual representation are available via:

- A Relational Database containing all Subcommittee on Sedimentation's compiled reservoir-survey information to facilitate analyses related to reservoir-sediment deposition.
- Interactive Maps for viewing reservoir-survey locations and ancillary information, and
- List of Reservoirs and Individual Data Sheets used to populate the relational database for all but two of the surveyed reservoirs.

RESSED, developed in March 2009 from its predecessor RESIS-II, is a work-in-progress, dynamic database. The Subcommittee on Sedimentation seeks additional or revised quality-assured sediment-survey information to improve and expand RESSED.



The Reservoir Sedimentation Database (RESSED) - Windows Internet Explorer

http://ida.water.usgs.gov/ressed/interactive_map/index.cfm

File Edit View Favorites Tools Help

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INTERACTIVE MAP

Select a State

Select a State or View the Reservoir Master List by Data Sheet Number.

AK - AL - AR - AZ - CA - CO - CT - DE - FL - GA - HI - IA - ID - IL - IN - KS - KY - LA - MA - MD - ME - MI - MN - MO - MS - MT - NC - ND - NE - NH - NJ - NM - NV - NY - OH - OK - OR - PA - PR - RI - SC - SD - TN - TX - UT - VA - VI - VT - WA - WI - WV - WY -

Done

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http://ida.water.usgs.gov/ressed/interactive_map/selectstate.cfm/011D084517540242B2/index.htm

File Edit View Favorites Tools Help

The Reservoir Sedimentation ...

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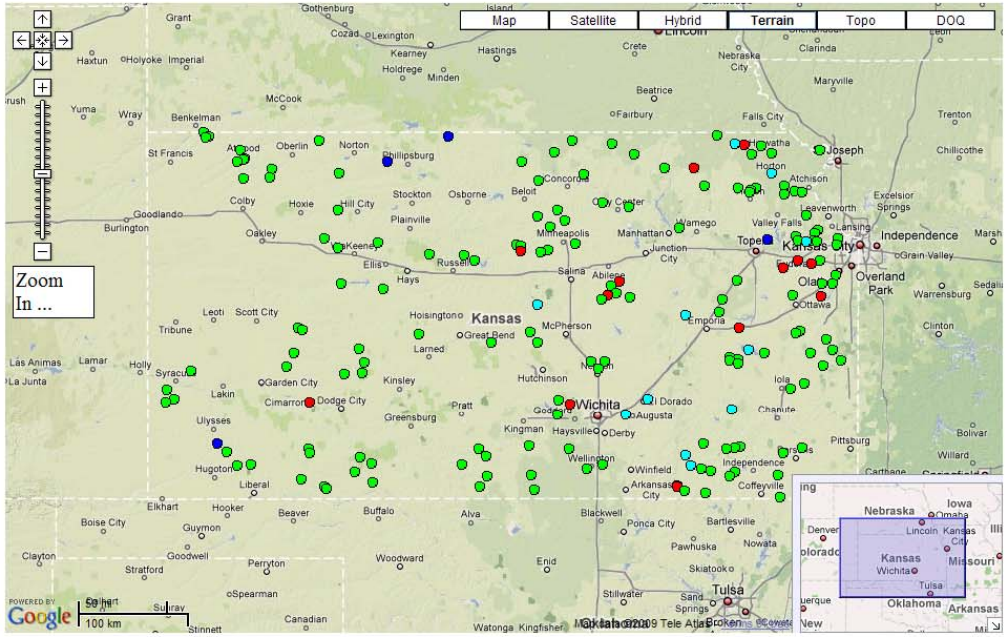

● Verified on 1:24,000 topo map ● NHD lat/lon of dam outlet, & Verified on 1:24,000 topo maps ● NID lat/lon

● Original datasheet lat/lon ● Located at nearest post office

Reservoir Name	County	Water Course	Data Sheet	Reservoir Map	NID ID
ADAIR	CHAUTAUQUA	NORTH CANEY RIVER	45-25	Map	
ADAMS	HARPER	TRIB. OF BLUFF CREEK	46-26	Map	
ALBERT SAUVAGE STOCKWATER DAM	RAWLINS	SAPPA CREEK	33-15	Map	KS01762
AMERINE	HAMILTON	TRIB. OF LITTLE BEAR CREEK	47-14	Map	KS03546
BARBER	RICE	TRIB. OF ARKANSAS RIVER	46-45	Map	
BARRETT	HARPER	WILD CREEK	46-31	Map	

Done Internet 100%

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SCS Form 34

Lake Meade

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RESERVOIR SEDIMENT
DATA SUMMARY

LAKE MEAD (HOOVER DAM)
NAME OF RESERVOIR

62-1a
DATA SHEET NO.

DAM

1. OWNER Interior - Bureau of Reclamation	2. STREAM Colorado	3. STATE Nevada - Arizona
4. SEC. 29 TWP. T22S RANGE R65E	5. NEAREST P.O Boulder City 6NE,	6. COUNTY Clark-Mohave
7. LAT 36° 01' " LONG 114° 44' "	8. TOP OF DAM ELEVATION 1232 1/	9. SPILLWAY CREST ELEV. 1221.4 2/

RESERVOIR

10. STORAGE ALLOCATION	11. ELEVATION TOP OF POOL	12. ORIGINAL SURFACE AREA, ACRES	13. ORIGINAL CAPACITY, ACRE-FEET	14. GROSS STORAGE, ACRE-FEET	15. DATE STORAGE BEGAN
a. FLOOD CONTROL	1229	162,600	1,587,000	32,471,000	
b. MULTIPLE USE 3/	1219.61	156,600	27,661,000	30,884,000	Feb. 1, 1935
c. POWER					
d. WATER SUPPLY					16. DATE NORMAL OPER. BEGAN
e. IRRIGATION					
f. CONSERVATION					
g. INACTIVE	895	33,400	3,223,000	3,223,000	Mar. 1, 1936

17. LENGTH OF RESERVOIR 152 4/ MILES — AV. WIDTH OF RESERVOIR 1.65 MILES

WATERSHED

18. TOTAL DRAINAGE AREA 167,800 SQ. MI.		22. MEAN ANNUAL PRECIPITATION 10 6/	INCHES
19. NET SEDIMENT CONTRIBUTING AREA 167,600 5/ SQ. MI.		23. MEAN ANNUAL RUNOFF 1.30	INCHES
20. LENGTH MILES	AV. WIDTH MILES	24. MEAN ANNUAL RUNOFF 11,610,000 7/	AC.-FT.
21. MAX. ELEV. 14,400	MIN. ELEV. 640	25. ANNUAL TEMP.: MEAN	RANGE

SURVEY DATA

26. DATE OF SURVEY	27. PERIOD YEARS	28. ACCL. YEARS	29. TYPE OF SURVEY	30. NO. OF RANGES OR CONTOUR INT.	31. SURFACE AREA, ACRES	32. CAPACITY, ACRE-FEET 8/	33. C/I. RATIO, AC.-FT. PER AC.-FT.
2-1-35	–	–	(D)	10 ft.	163,000	32,471,000	2.80
9-30-48	13.7	13.7	(D)	10 ft.	163,000	31,047,000	2.67
10-14-64	16.0	29.7	(D)	10 ft.	163,000	29,755,000	2.56

26. DATE OF SURVEY	34. PERIOD ANNUAL PRECIPITATION	35. PERIOD WATER INFLOW, ACRE-FEET			36. WATER INFL. TO DATE, AC.-FT.	
		a. MEAN ANNUAL	b. MAX. ANNUAL	c. PERIOD TOTAL	a. MEAN ANNUAL	b. TOTAL TO DATE
9-30-48		12,526,000	17,260,000	175,362,000	12,526,000	175,362,000
10-14-64		10,083,000	18,160,000	161,335,000	11,610,000	336,697,000

26. DATE OF SURVEY	37. 8/ PERIOD CAPACITY LOSS, ACRE-FEET			38. TOTAL SED. DEPOSITS TO DATE, ACRE-FEET		
	a. PERIOD TOTAL	b. AV. ANNUAL	c. PER SQ. MI.-YEAR	a. TOTAL TO DATE	b. AV. ANNUAL	c. PER SQ. MI.-YEAR
9-30-48	1,424,000	104,000	0.621	1,424,000	104,000	0.621
10-14-64	1,292,000	80,750	0.482	2,716,000	91,450	0.546

26. DATE OF SURVEY	39. AV. DRY WGT., LBS. PER CU. FT.	40. SED. DEP., TONS PER SQ. MI.-YR.		41. STORAGE LOSS, PCT.		42. SED. INFLOW, PPM	
		a. PERIOD	b. TOTAL TO DATE	a. AV. ANN.	b. TOT. TO DATE	a. PERIOD	b. TOT. TO DATE
9-30-48	65 9/	879	879	0.320	4.39	8,460	8,460
10-14-64	60	572	714	0.282	8.36	7,700	7,760

SELECTED RESSED DATABASE CHARACTERISTICS

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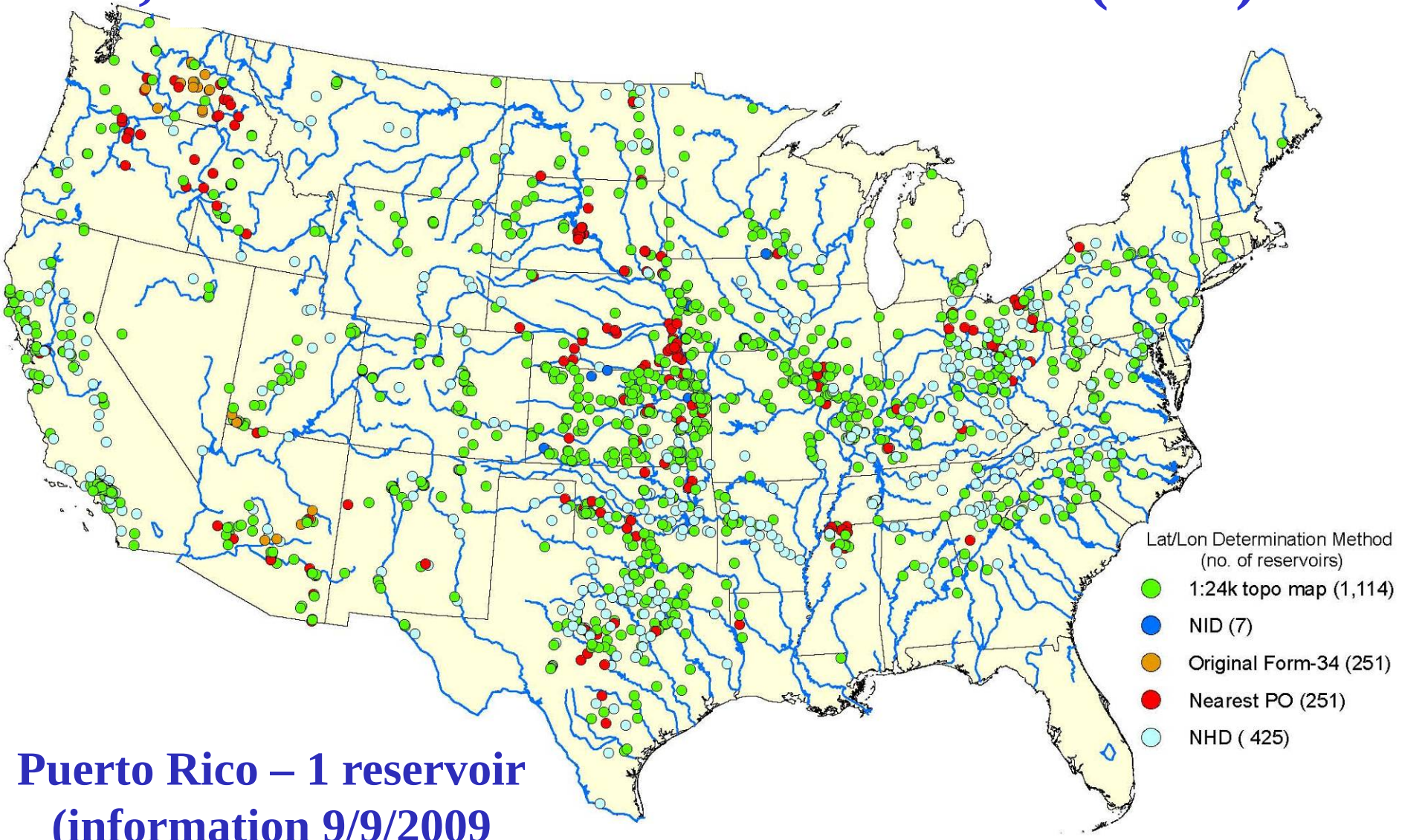
1,824 RESSED Reservoir Locations (2009)



Puerto Rico – 1 reservoir
(information 9/9/2009
D.W. Stewart)

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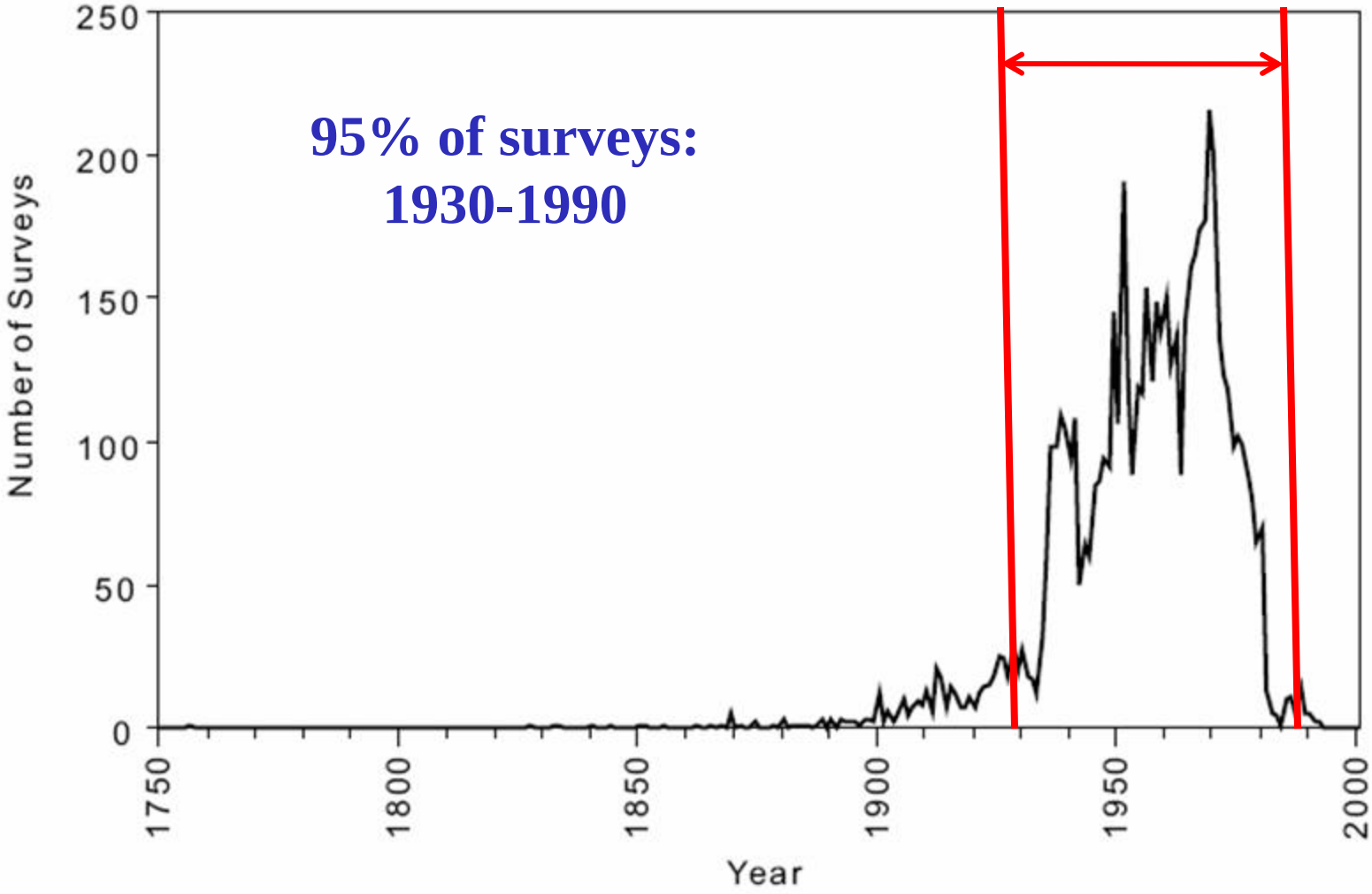
RESSED Reservoir Surveys by Year



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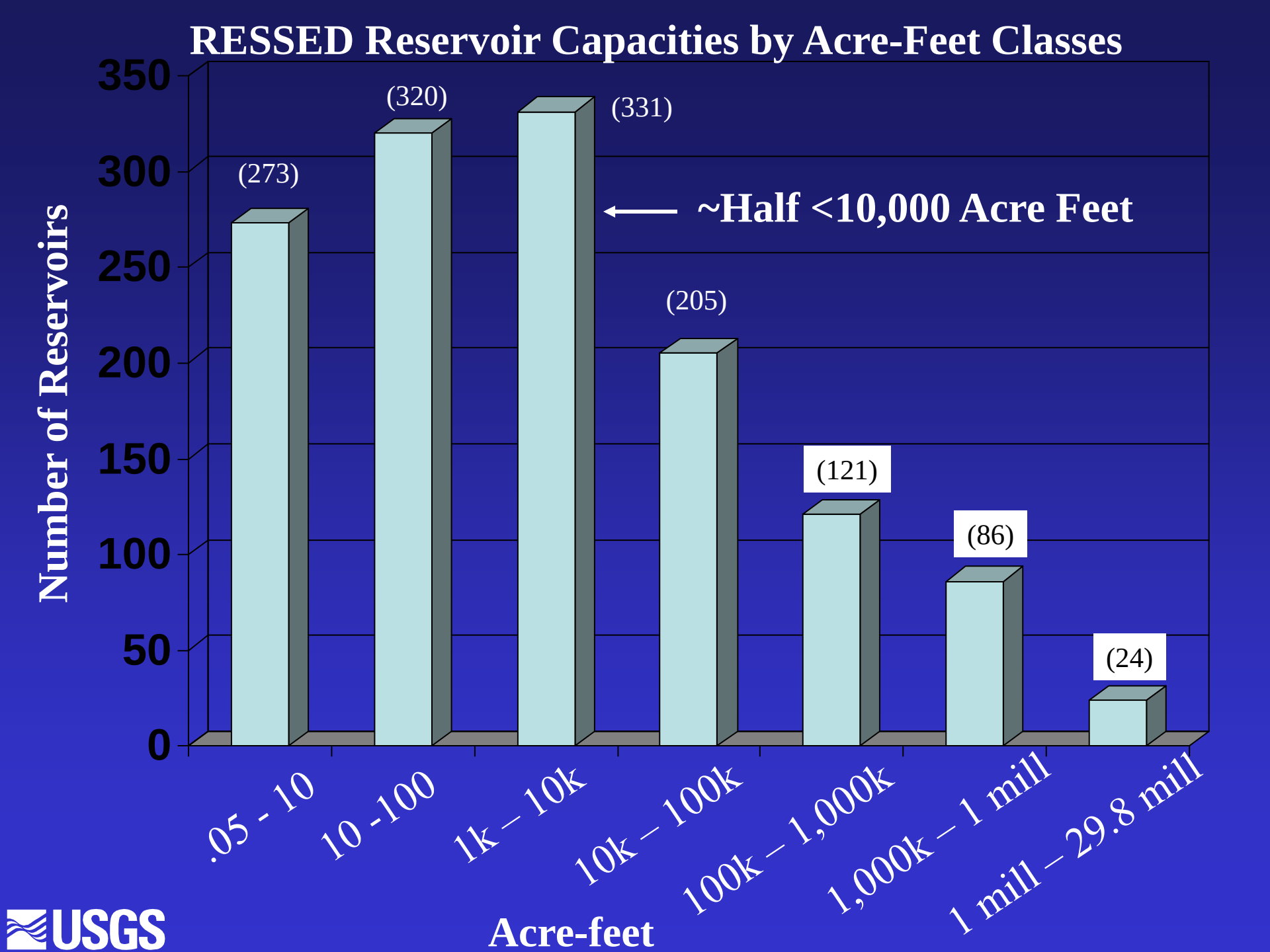
RESSED Reservoir Capacities by Acre-Feet Classes
Number of Reservoirs
350
300
250
200
150
100
50
0
(273)
(320)
(331)
(205)
(121)
(86)
(24)
~Half <10,000 Acre Feet
.05 - 10
10 -100
1k – 10k
10k – 100k
100k – 1,000k
1,000k – 1 mill
1 mill – 29.8 mill
Acre-feet
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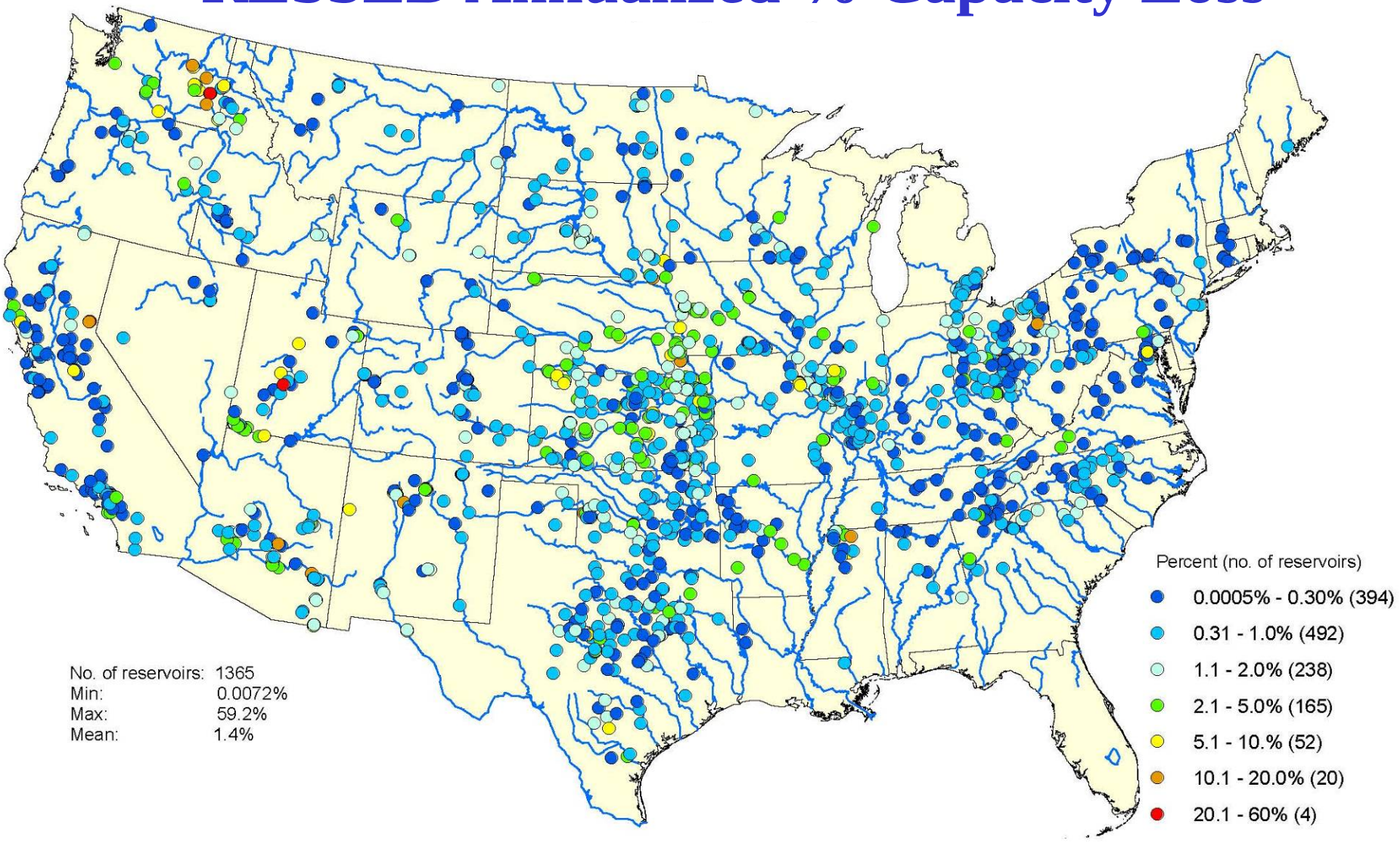
RESSED Annualized % Capacity Loss



~82%: <2% capacity loss/year (1,124/1,365 reservoirs)

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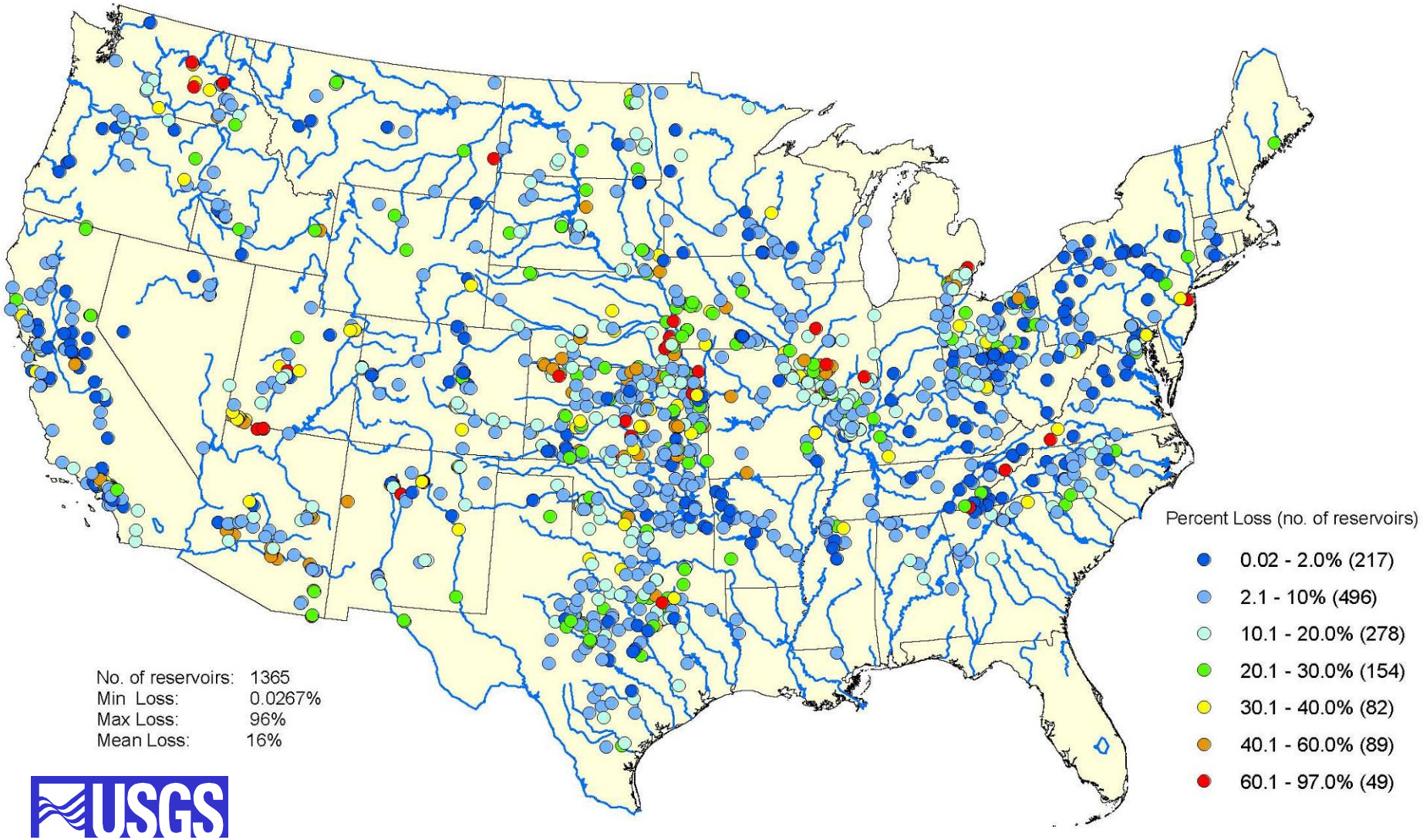
RESSED Total % Capacity Loss



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~32% have lost 10-30% capacity (432/1,365 reservoirs)

Other RESSED Issues

- SCS Form 34 is but one of many data formats that now exist
  - Bureau of Reclamation e-Form 34
  - Corps 2008 Reservoirs Data Call format
  - On-line reservoir information from Maryland, elsewhere
- GPS, depth sounders, other instrumentation provide a wealth of new types of information, much of which needs to be stored
- Quality assurance protocols have special data-storage requirements
- Current RESSED isn’t amenable to the long haul

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*FilemakerPro Front End

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Other RESSED Issues (cont)

- Let's do a little math:

  -1,824 reservoirs in RESSED

  - ~80,000 dams (ergo reservoirs?) in the National Inventory of Dams

  - ~?6 million – 9 million impoundments in the U.S. (USGS National Hydrography Dataset; Renwick, Miami of Ohio)

- Hence, the number of reservoirs in RESSED are:
  - ~2% of number of dams in the NID (but not all cross-listed)
  - ~0.03% of U.S. impoundments

RESSED Reservoirs are much less than the "tip of the iceberg"

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Ergo….

THE NATION NEEDS A CAREFULLY DESIGNED AND FULLY POPULATED NATIONAL “RESSED-FUTURE”

- UNRESTRICTED ACCESS/USE
- LINKED TO OTHER KEY DATABASES (NID, ETC)
- UPDATABLE
- CAPABLE OF STORING ALL RELEVANT DATA
- ANALYZABLE LOCAL, REGIONAL, NATIONAL SCALES

BUILD IT AND THEY WILL COME

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Take Home Message

- ✓ RESSED on-line, useful tool – best we've got?
- ✓ Work in Progress
- ✓ Short Term: Need update capability, report production, other information
- ✓ Long Term:
  1. Need base-funded project
  2. Need data types & requirements statement
  3. Need new database architecture
- ✓ Interested in helping….?


The Beginning
http://ida.water.usgs.gov/ressed/