Continuation of ESPAM Return Flows

ESHMC Meeting

October 28, 2008

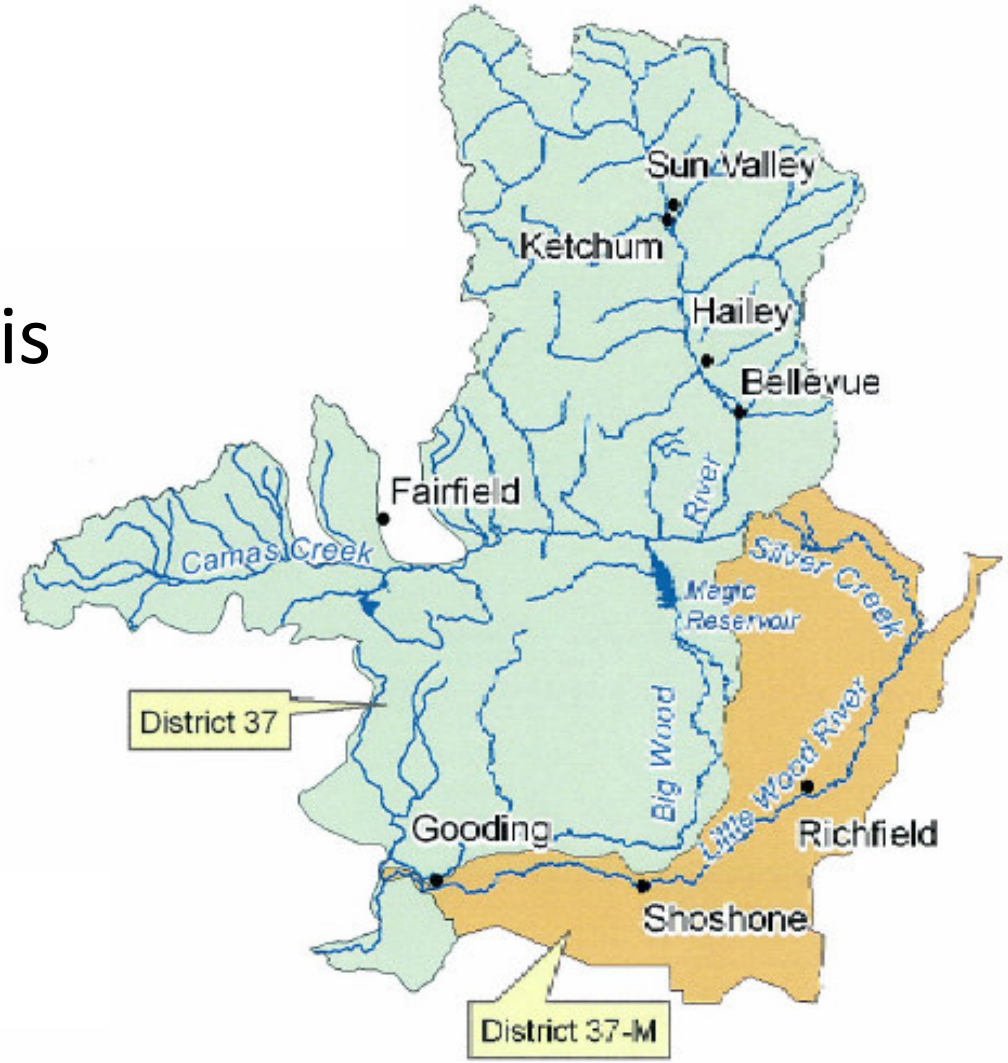
Stacey Taylor

Last Meeting

- Discussed monthly analysis of the groups and historical data (returns vs. diversions)
- Overview of requests to pursue (hydropower facilities, wetlands/ponds, PDSI, etc.)
- Discussed the possibility of using correlation software (MATLAB) to analyze relationship of returns to PDSI and precipitation
- Final decision:
  - Look at percent returned vs. PDSI and precipitation
  - Apply Dick Lutz's algorithm to all monthly data (look at plots of measured returns vs. predicted returns)

Visit with the Watermaster (Dist. 37 & 37M)

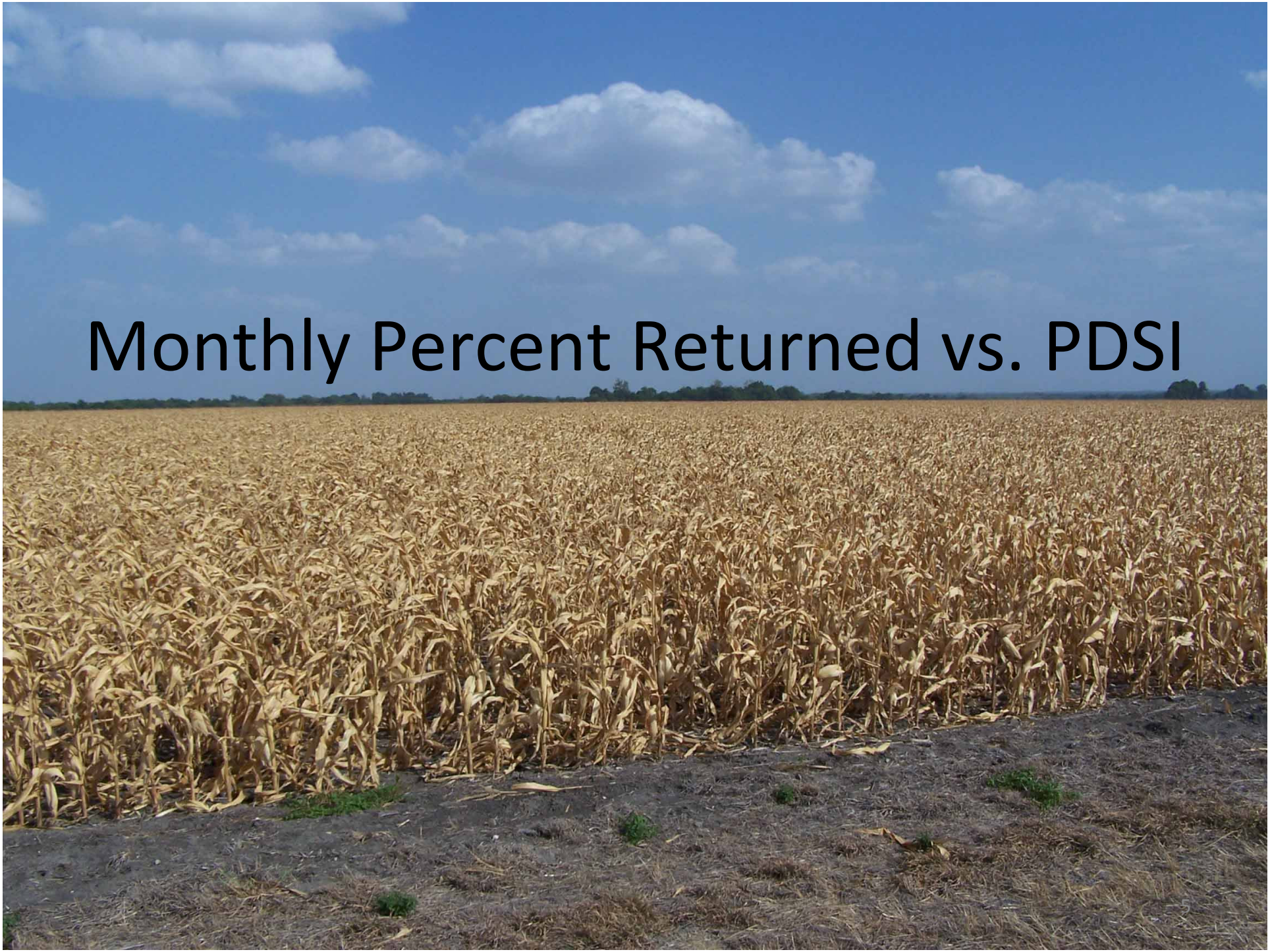
- Goal: Meet with Kevin Lakey to improve understanding of this area
- Will be receiving more data for this area that we previously didn't have



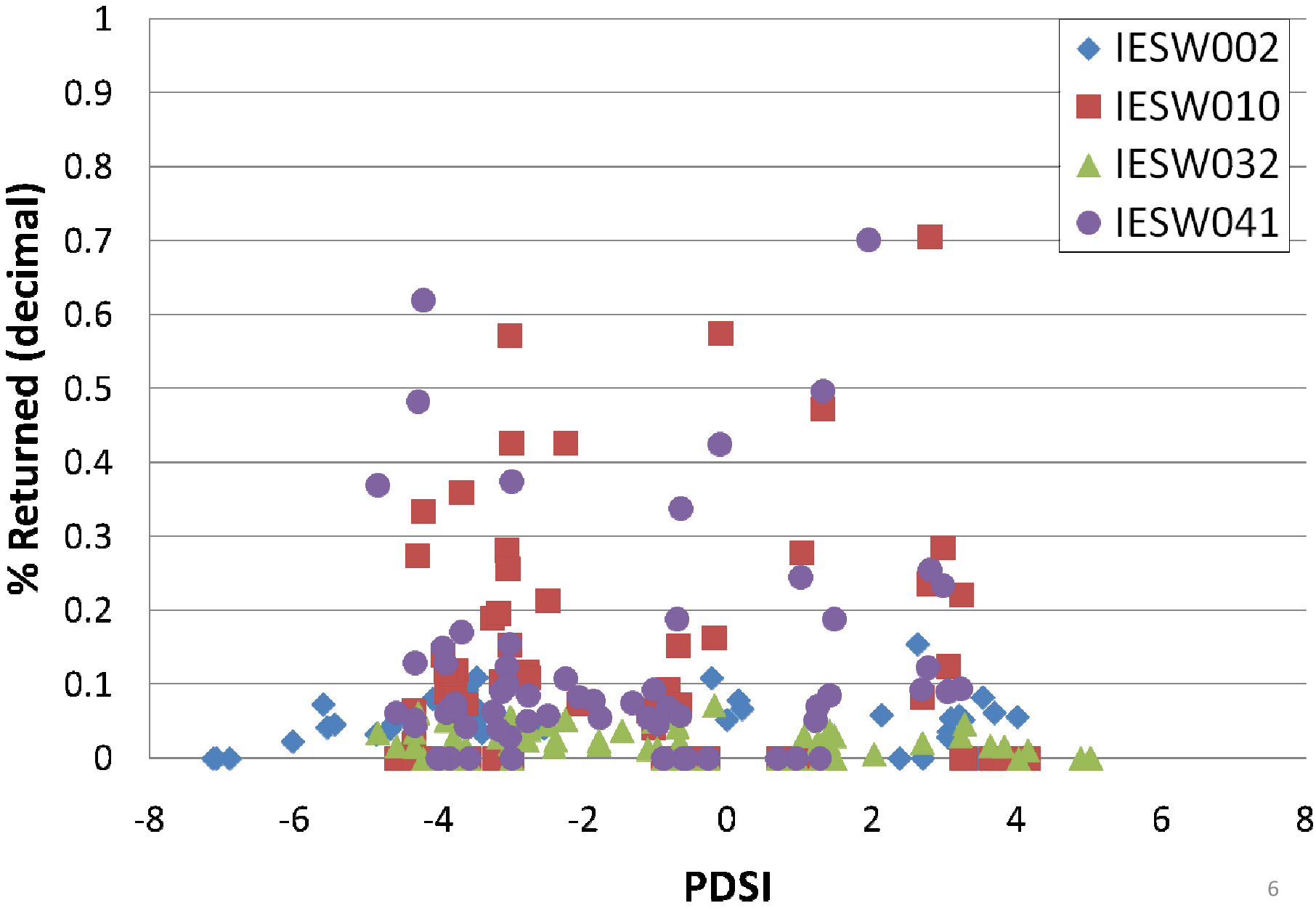
Future Work (Craig Groubaugh)

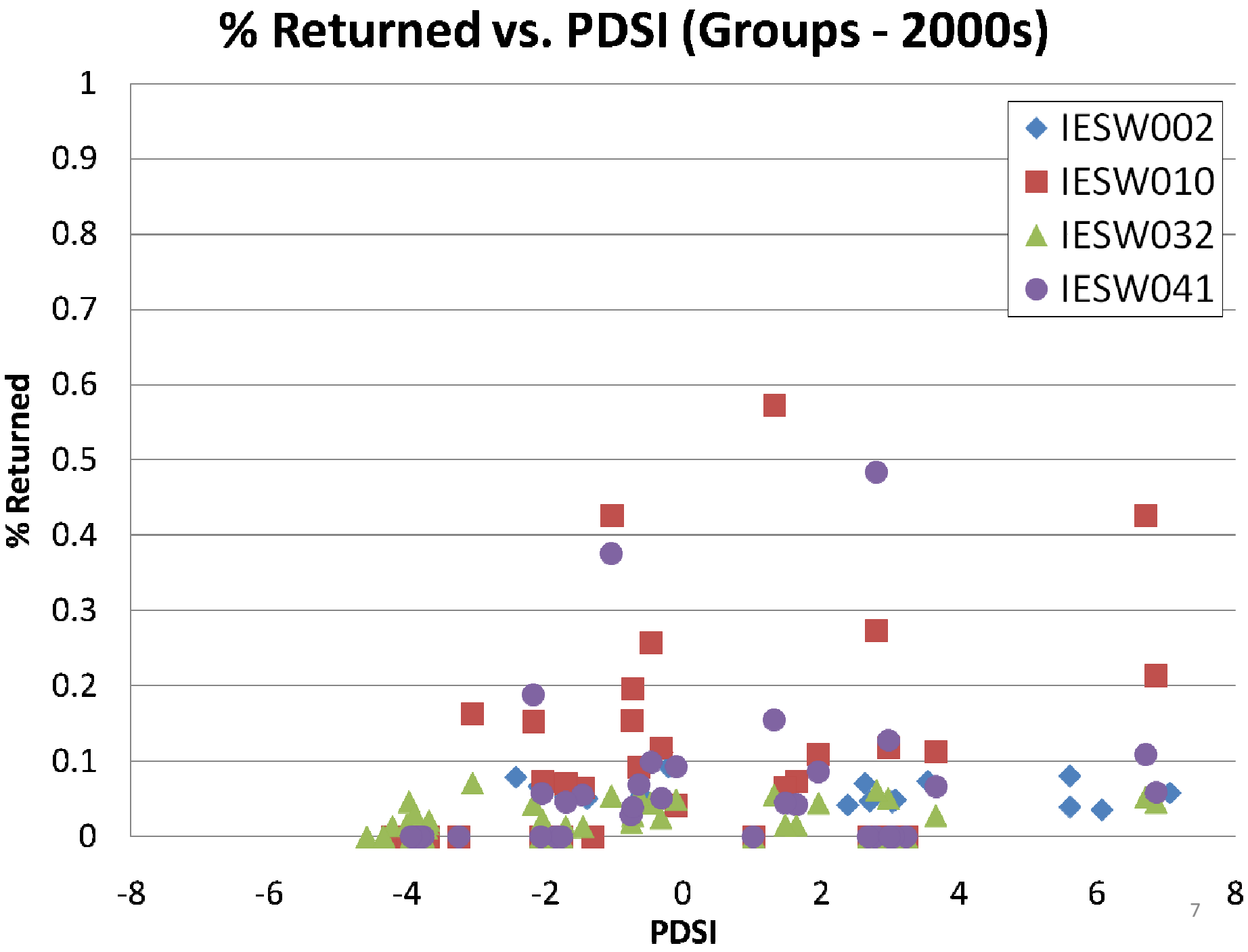
- Craig will be working on studying the Richfield Canal
- More detailed analysis to be performed as a grad project to more fully understand this system
- We're hoping to use his findings to help us with other entities

Monthly Percent Returned vs. PDSI

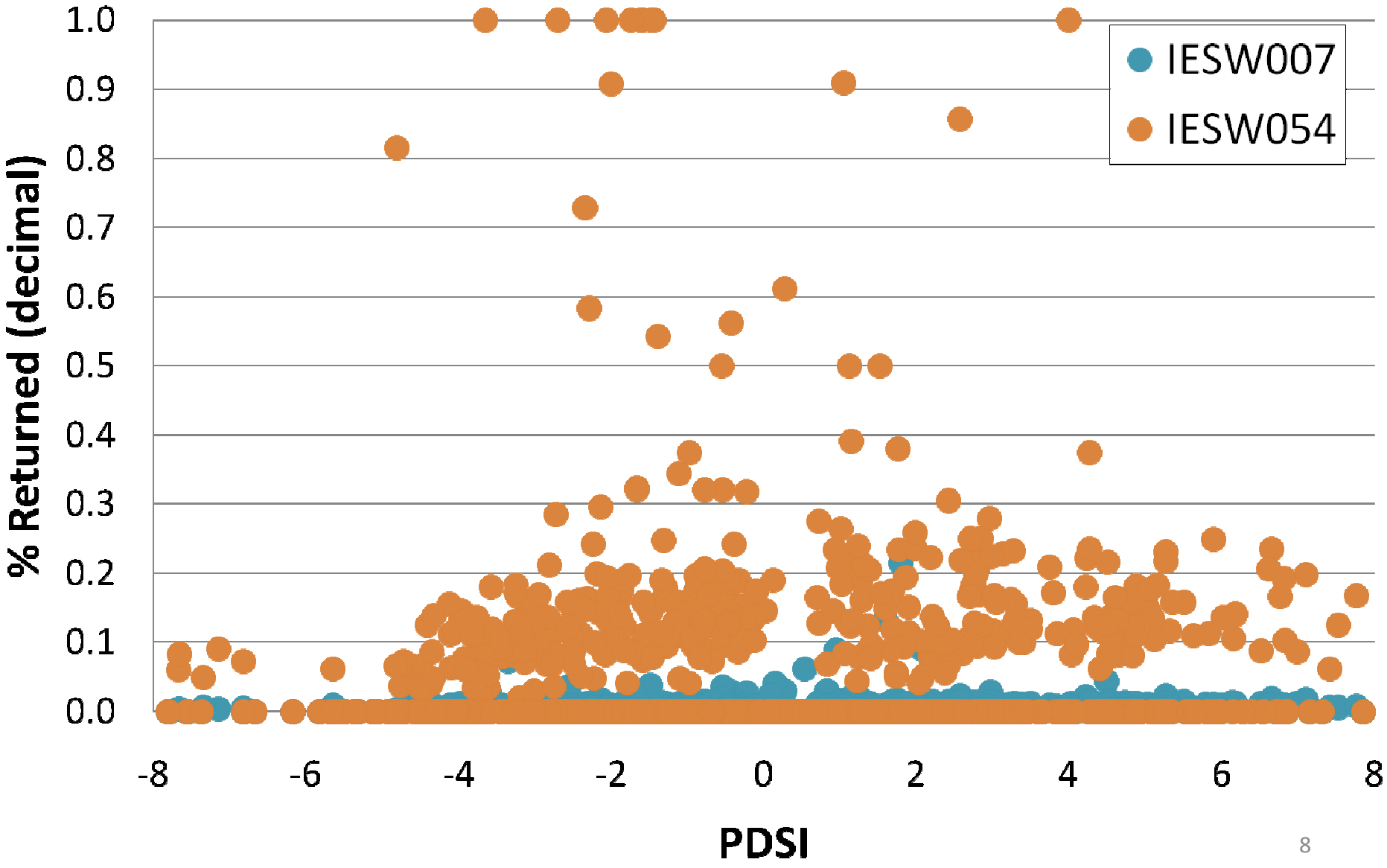


% Returned vs. PDSI (Groups - All data)

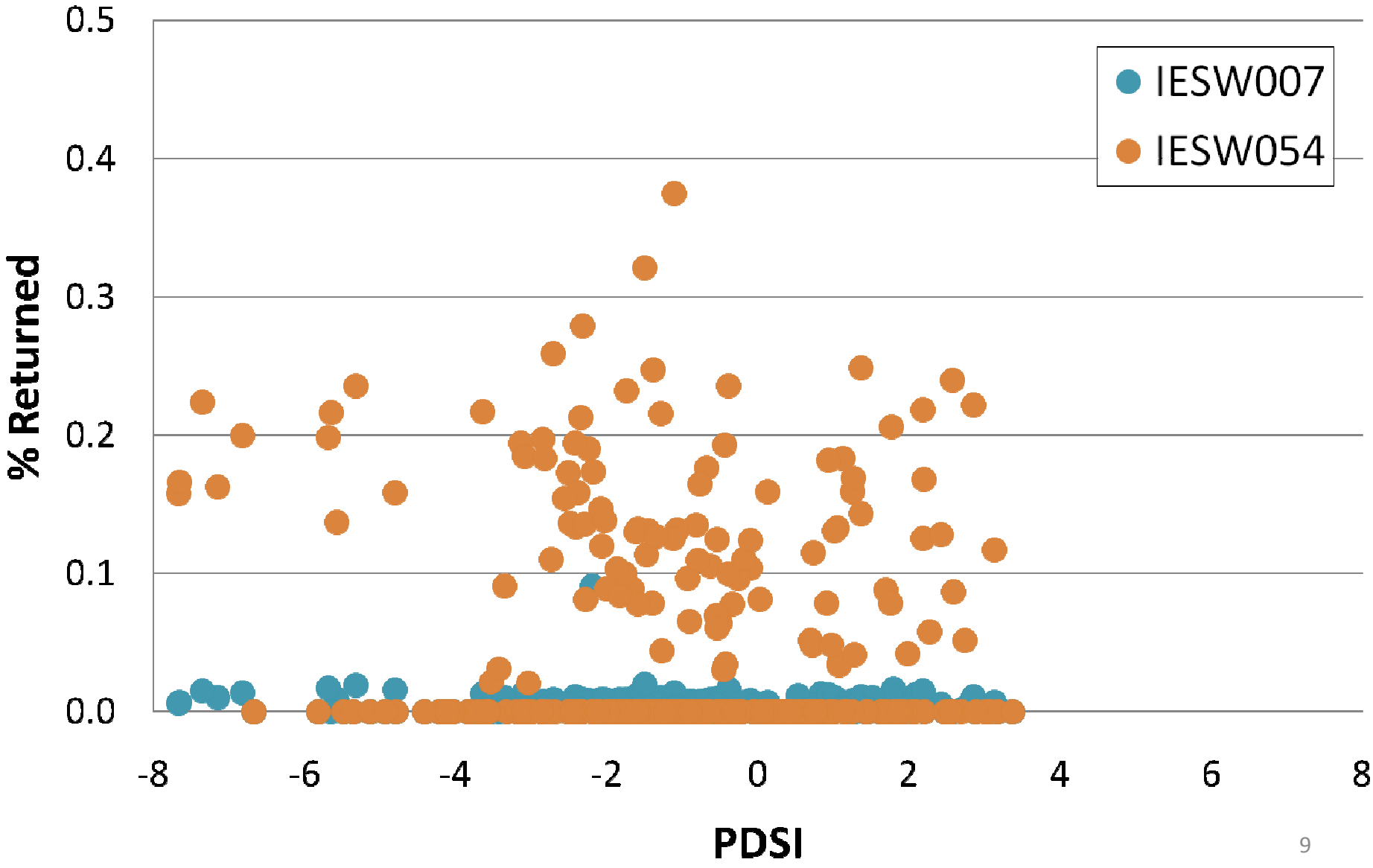


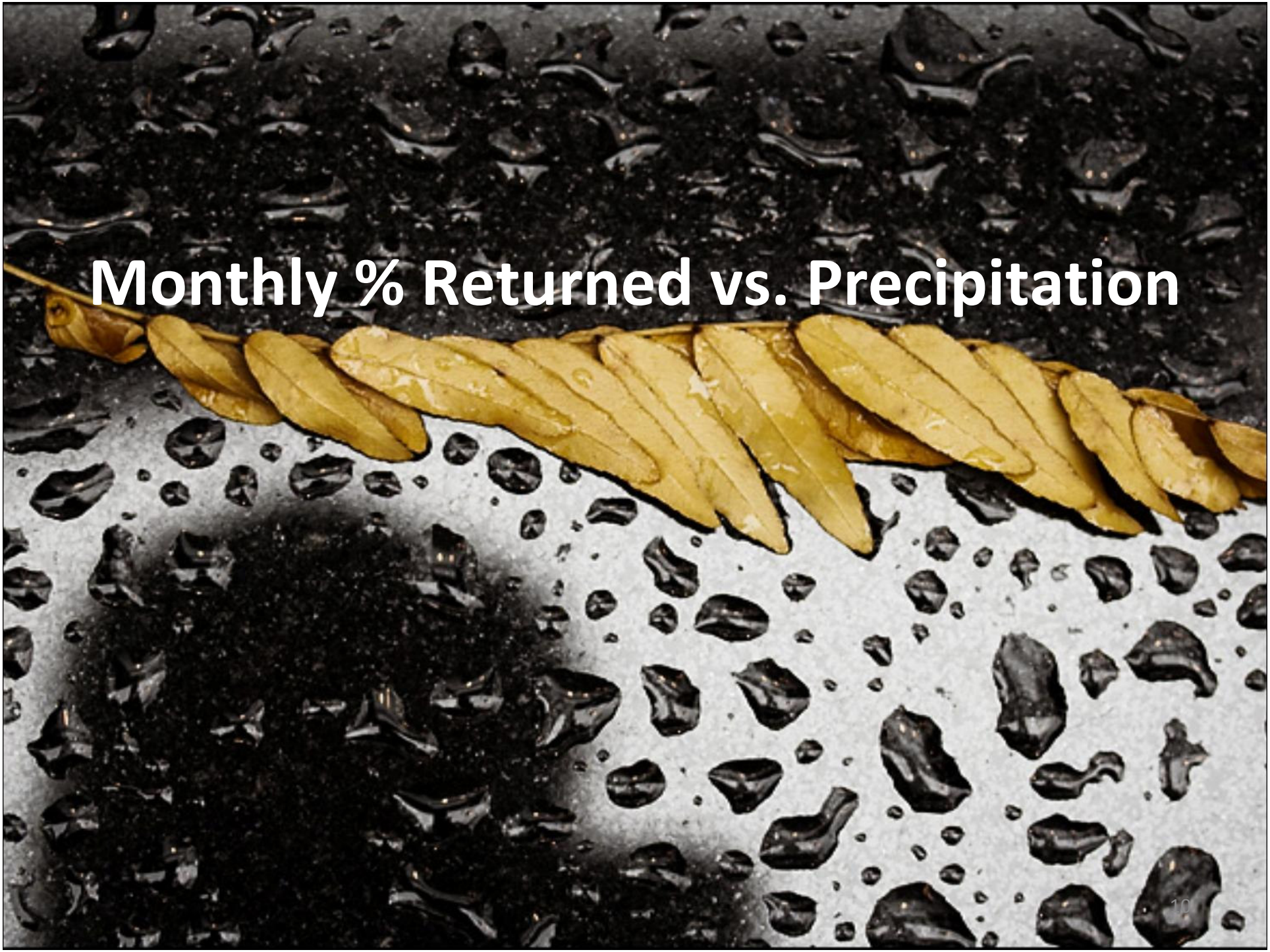

% Returned vs. PDSI (Groups - 2000s)
% Returned
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-8
-6
-4
-2
0
2
4
6
8
PDSI
IESW002
IESW010
IESW032
IESW041

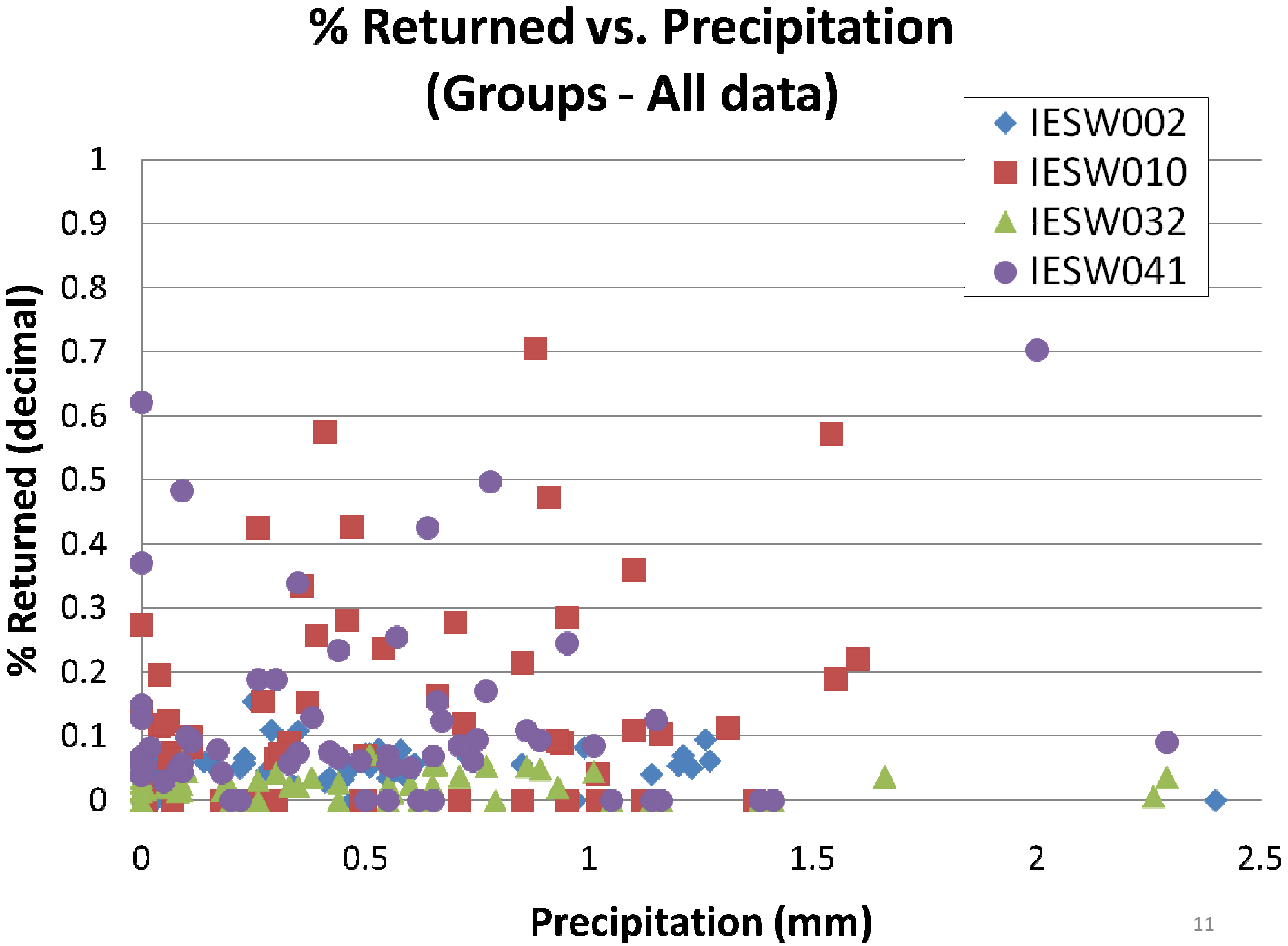
% Returned vs. PDSI
(Historical Data - All data)



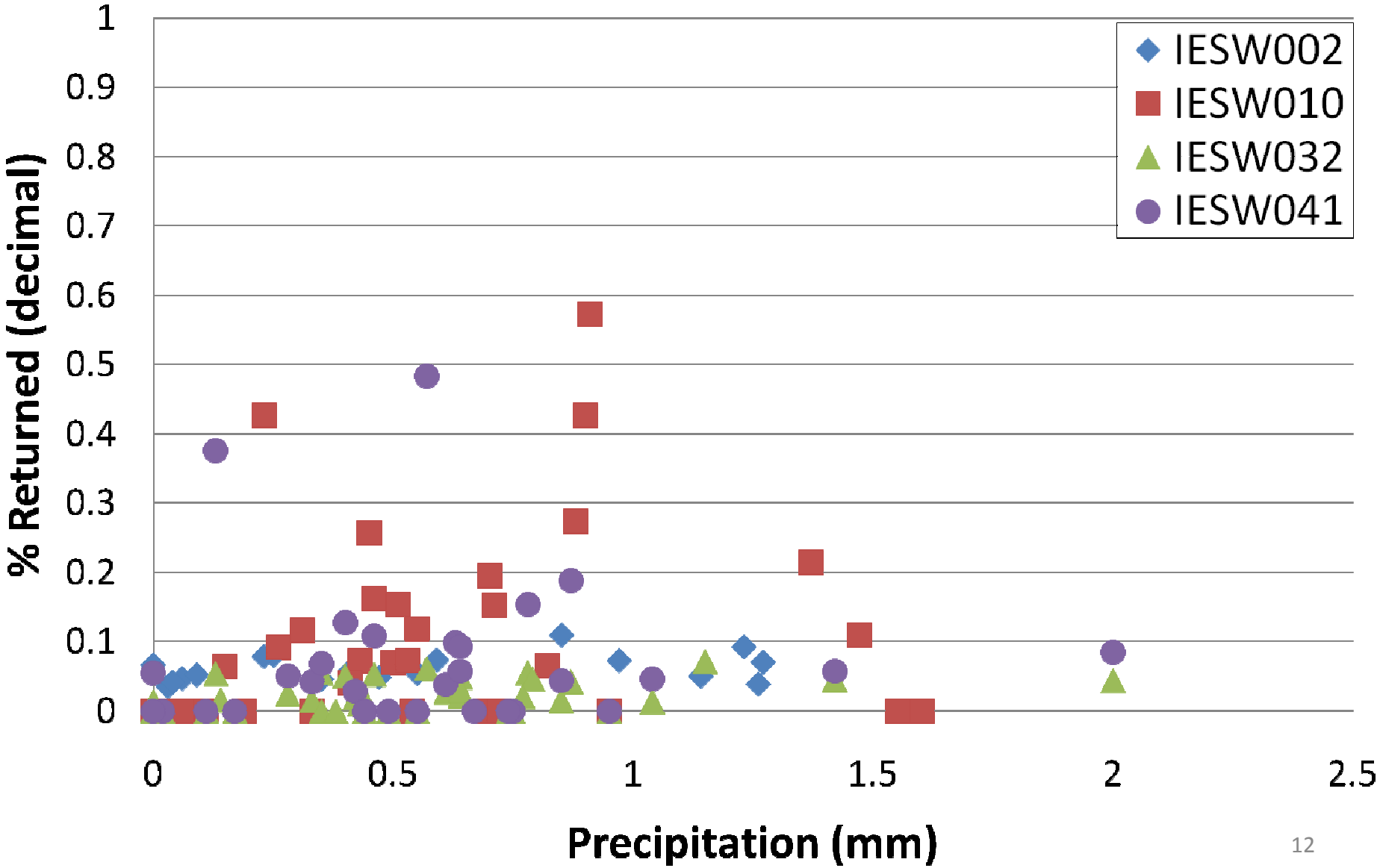
% Returned vs. PDSI
(Historical Data - 1980s-2000s)



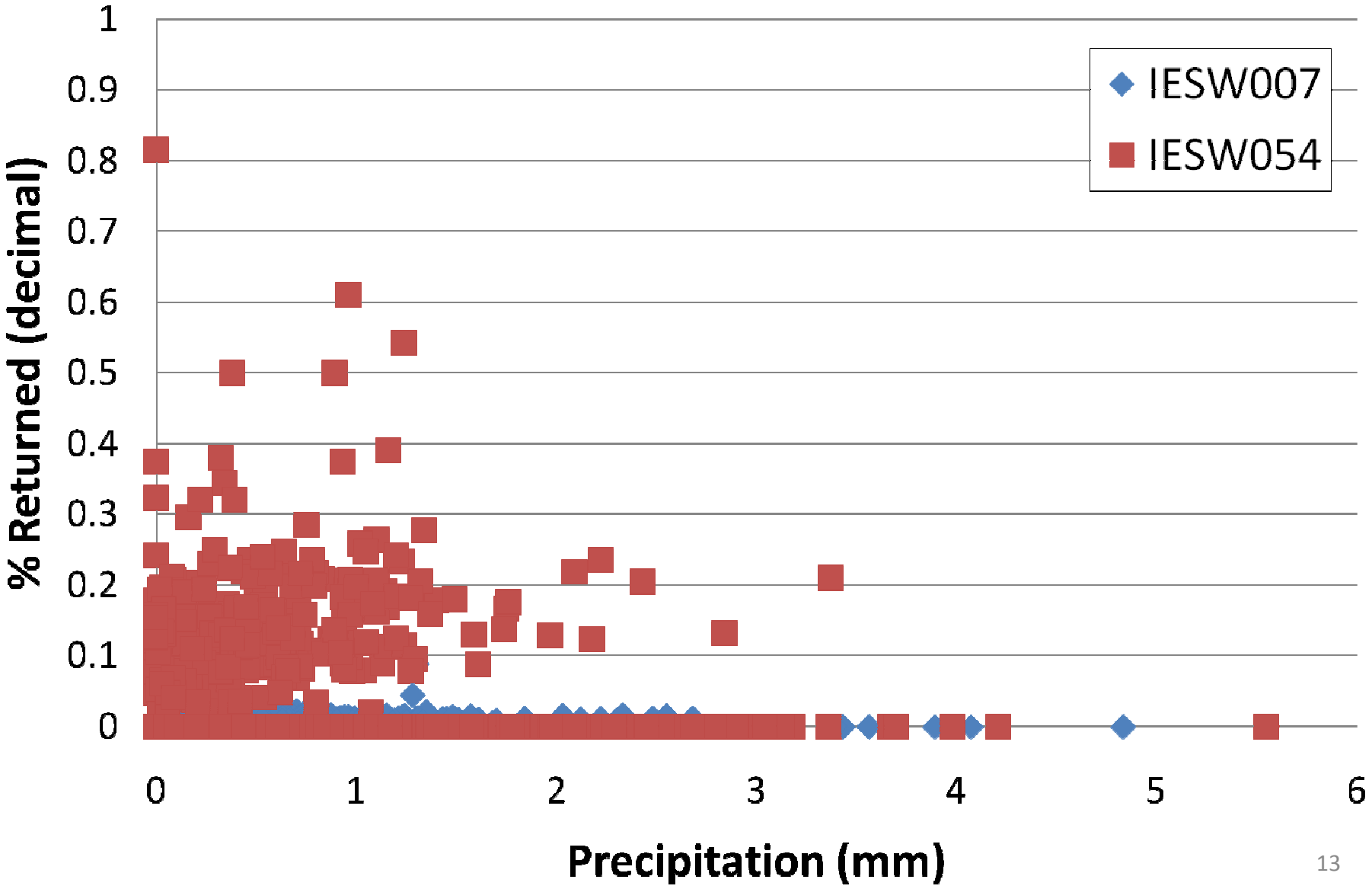

Monthly % Returned vs. Precipitation


% Returned vs. Precipitation
(Groups - All data)
IESW002
IESW010
IESW032
IESW041
% Returned (decimal)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.5
1
1.5
2
2.5
Precipitation (mm)

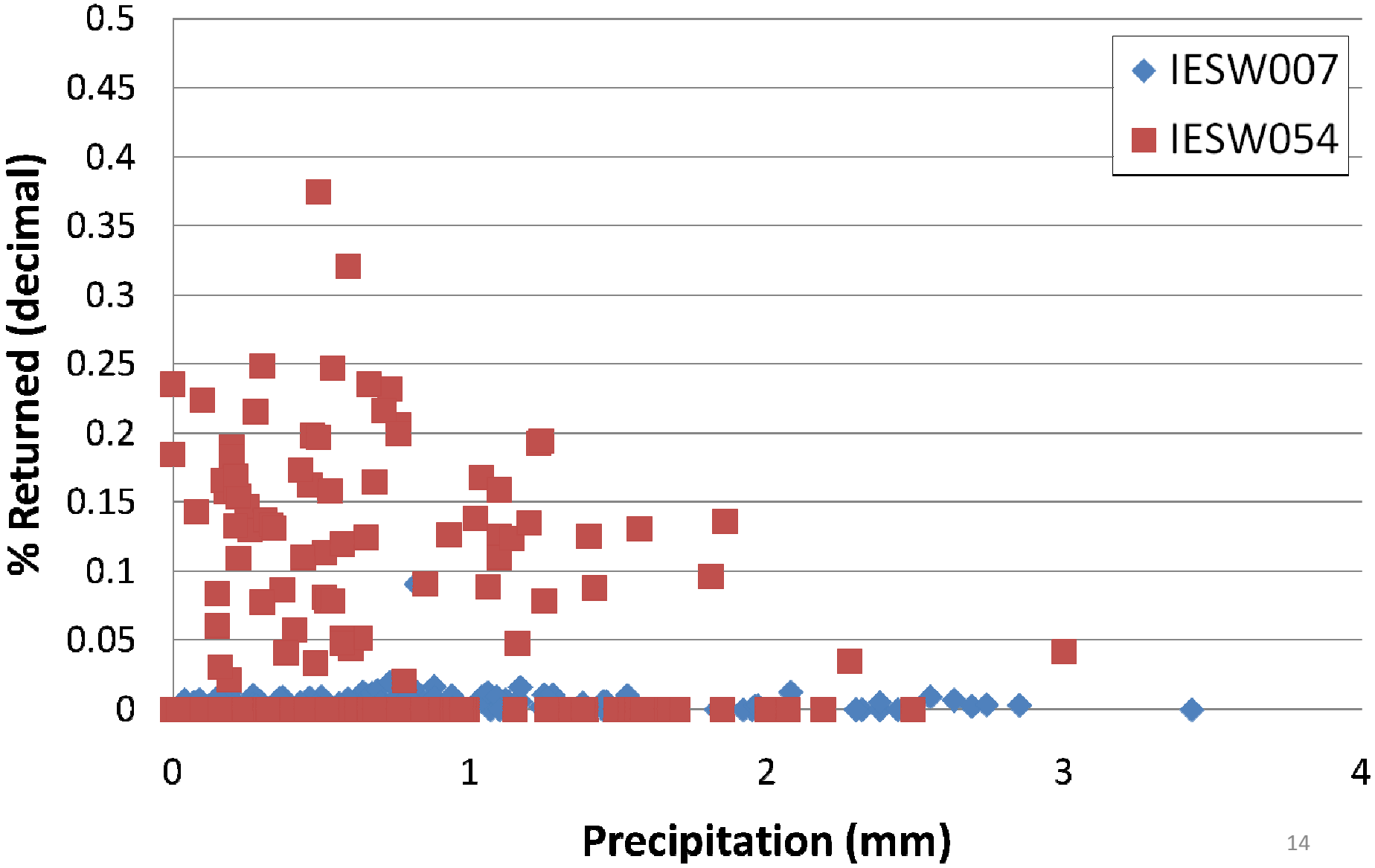
% Returned vs. Precipitation (Groups - All data)

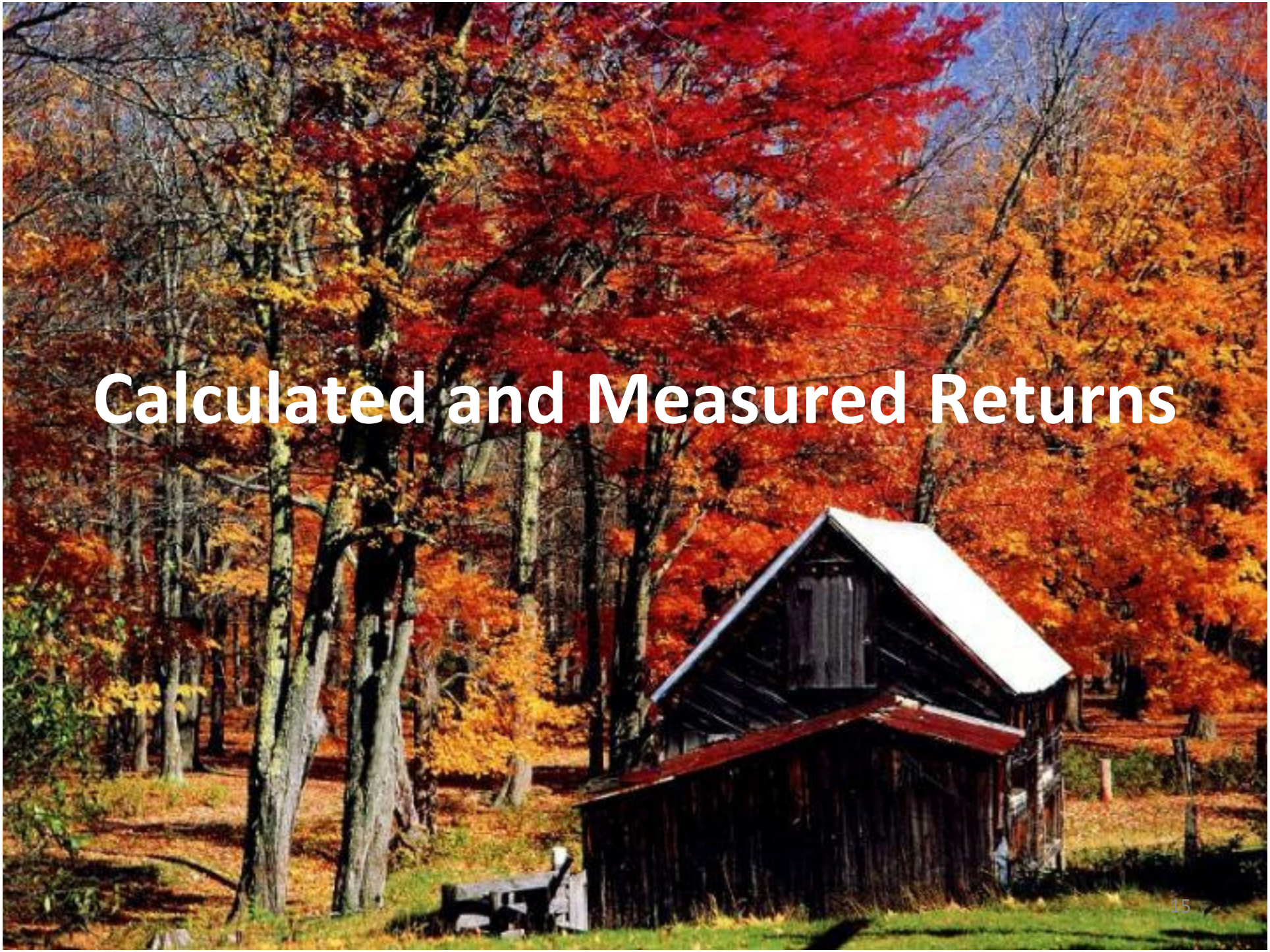


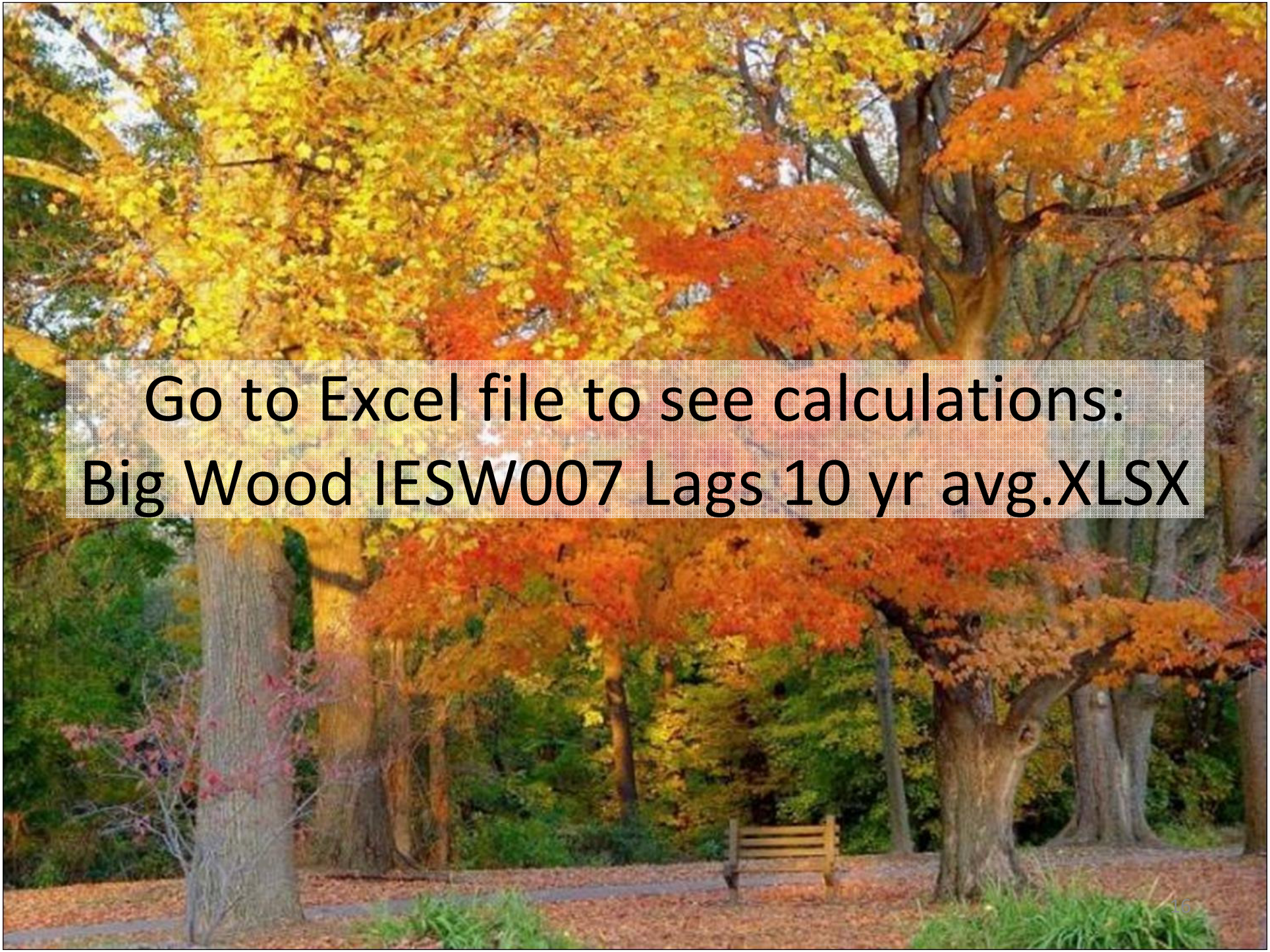
% Returned vs. Precipitation (Historical - All Data)



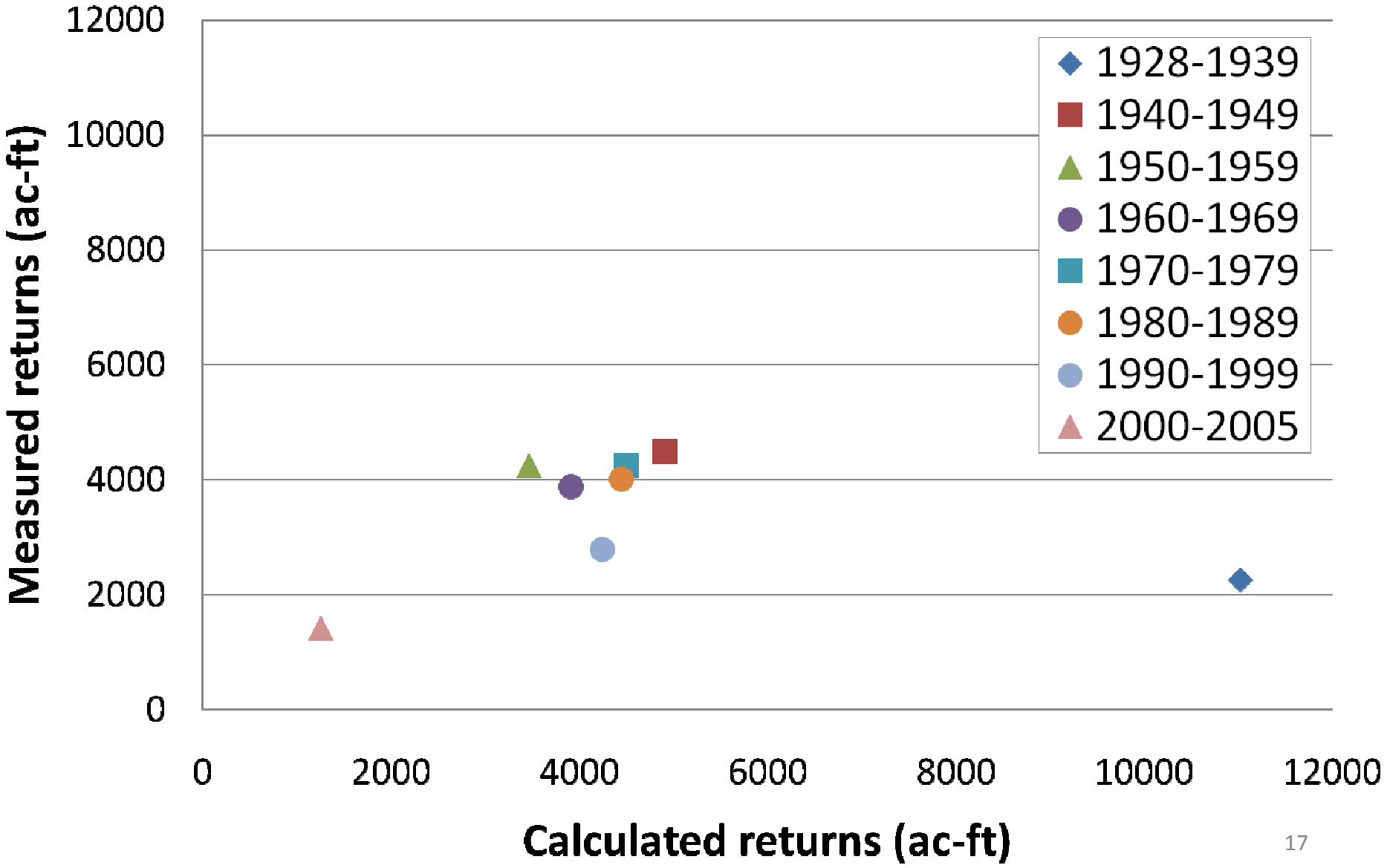
% Returned vs. Precipitation (Historical – 1980s-2000s)

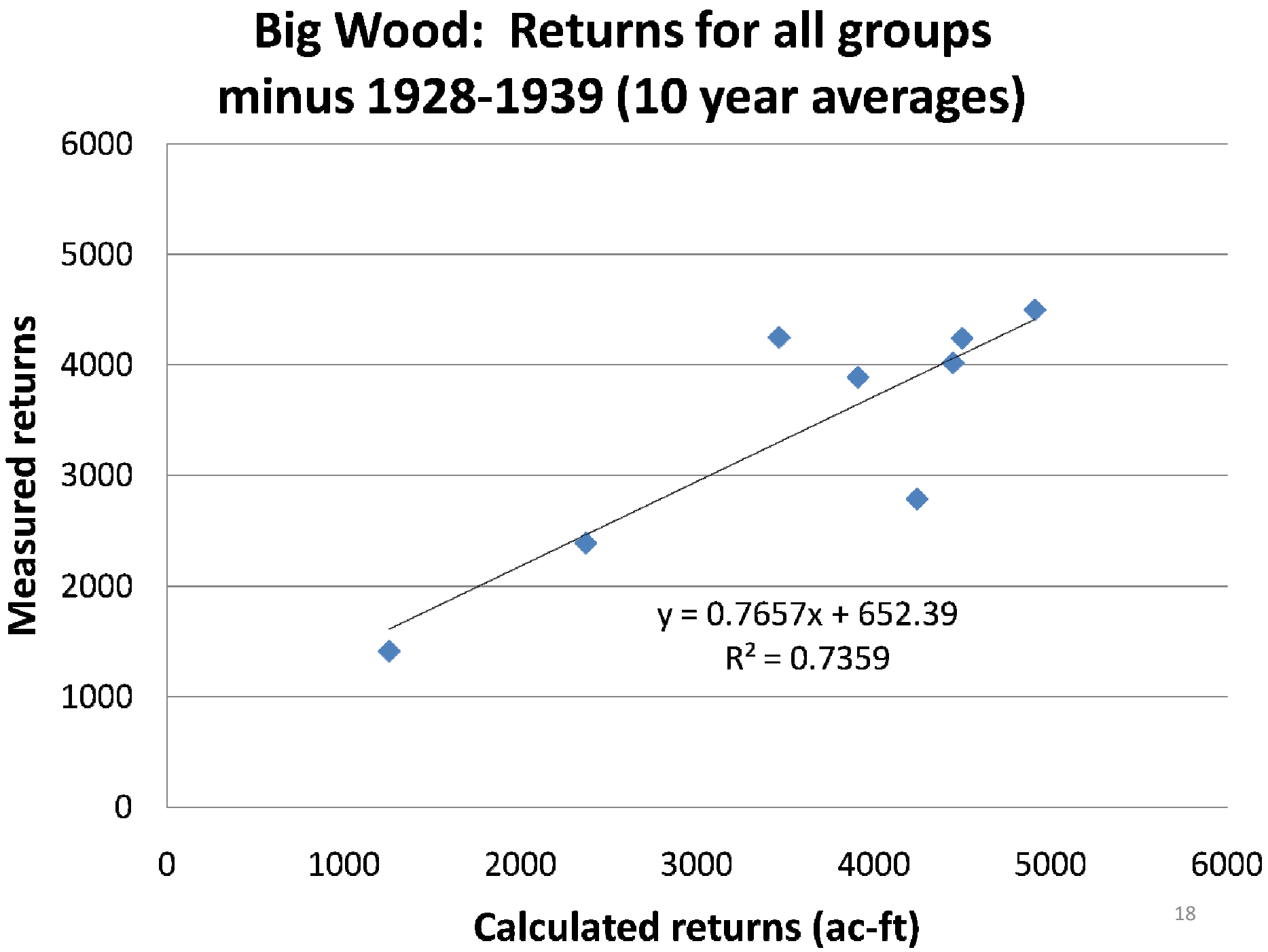



Calculated and Measured Returns

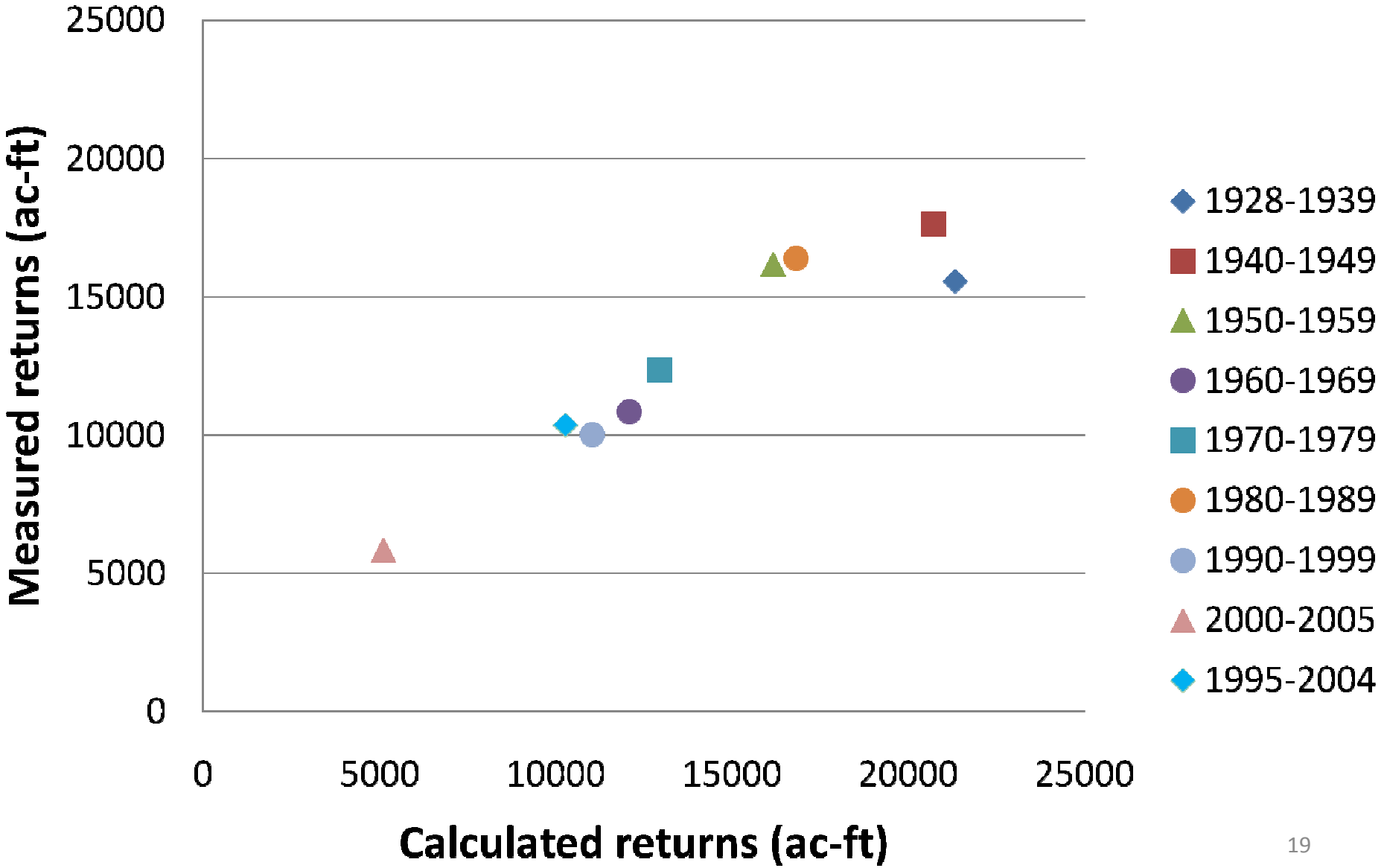

Go to Excel file to see calculations:
Big Wood IESW007 Lags 10 yr avg.XLSX

Big Wood: Measured vs. Calculated Returns (10 year average)

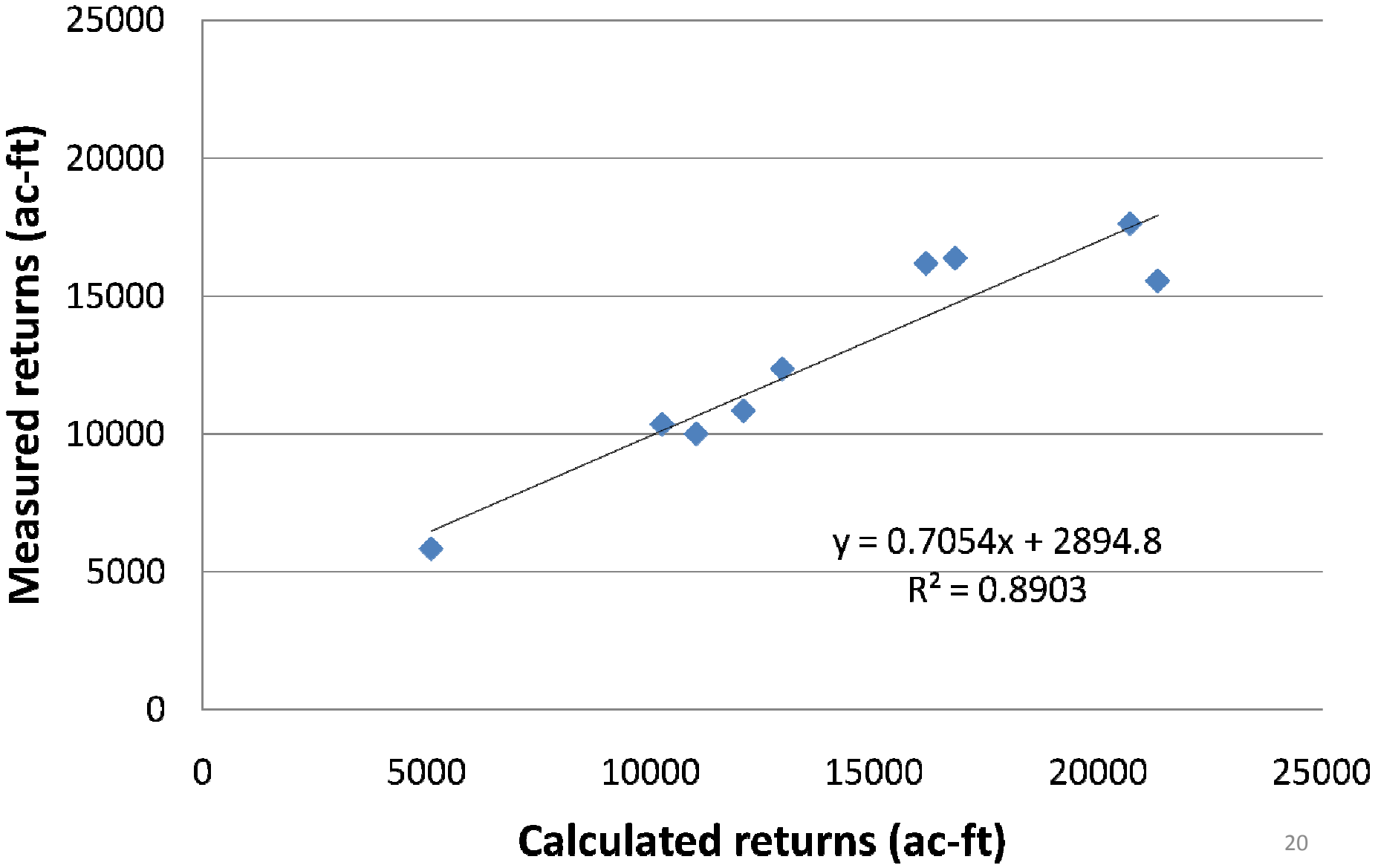



Big Wood: Returns for all groups minus 1928-1939 (10 year averages)
Measured returns
6000
5000
4000
3000
2000
1000
0
0
1000
2000
3000
4000
5000
6000
Calculated returns (ac-ft)
y = 0.7657x + 652.39
R² = 0.7359

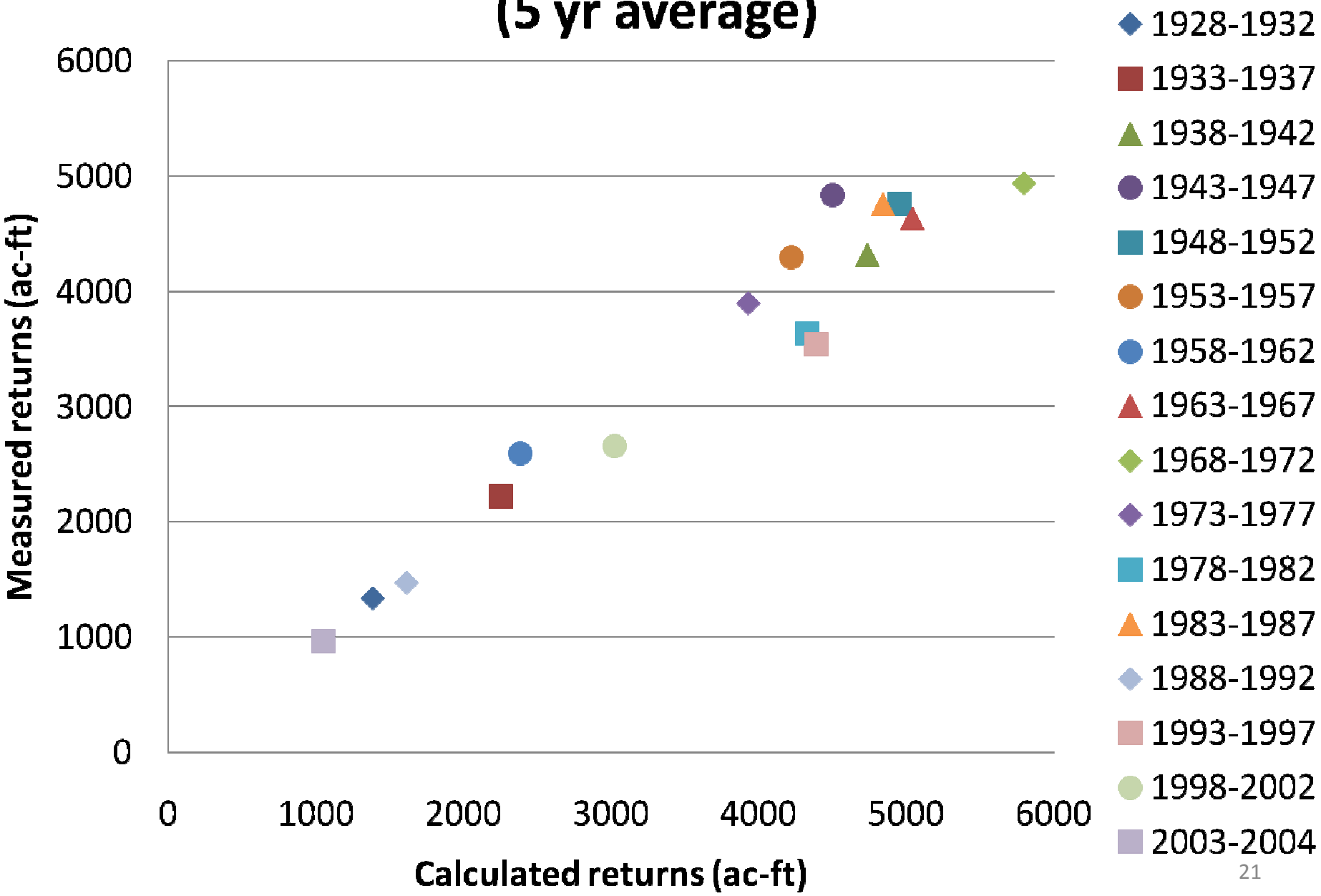
Richfield: Measured vs. Calculated Returns (10 yr average)



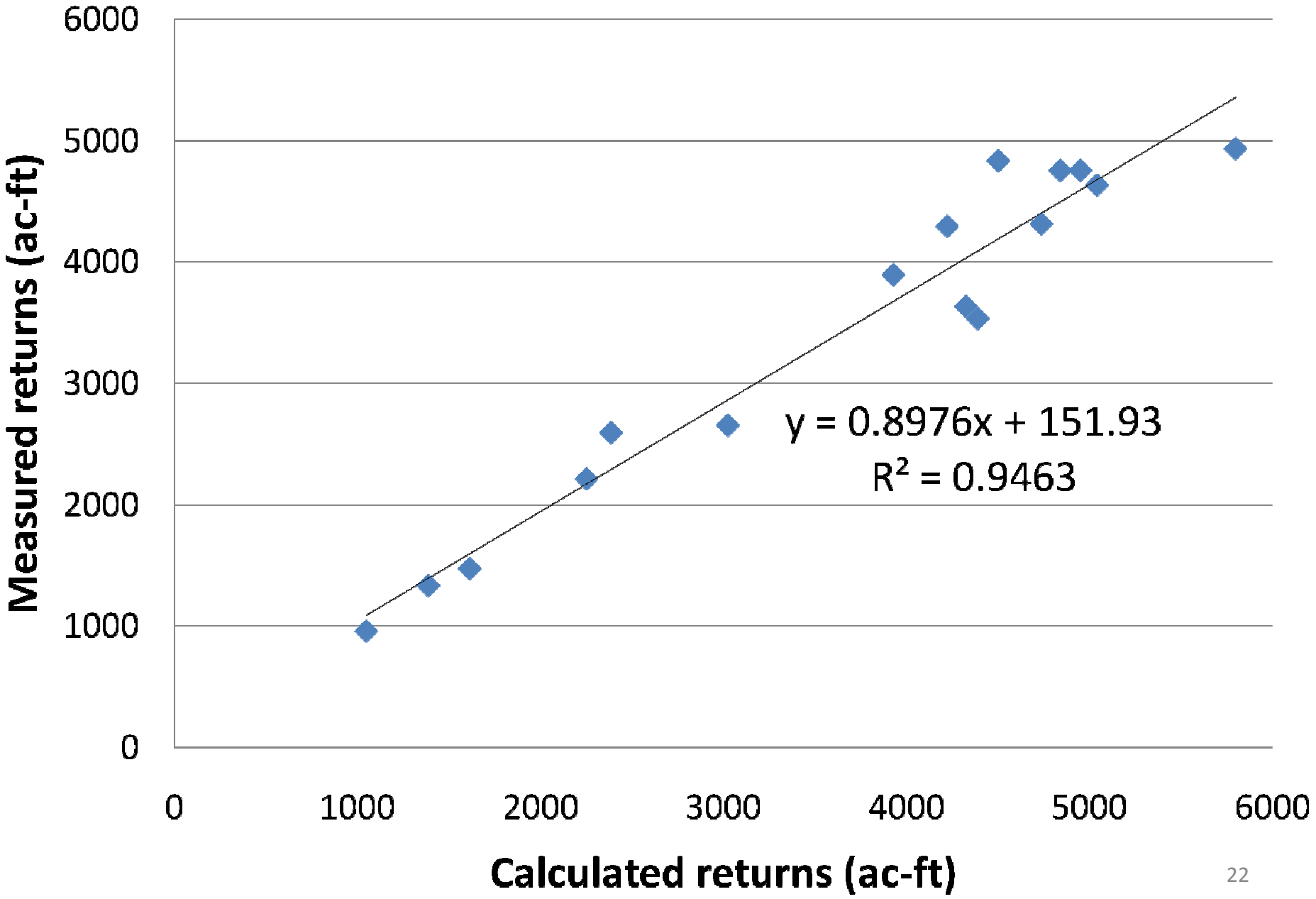
Richfield: Returns for all groups minus 1928-1939 (10 yr average)



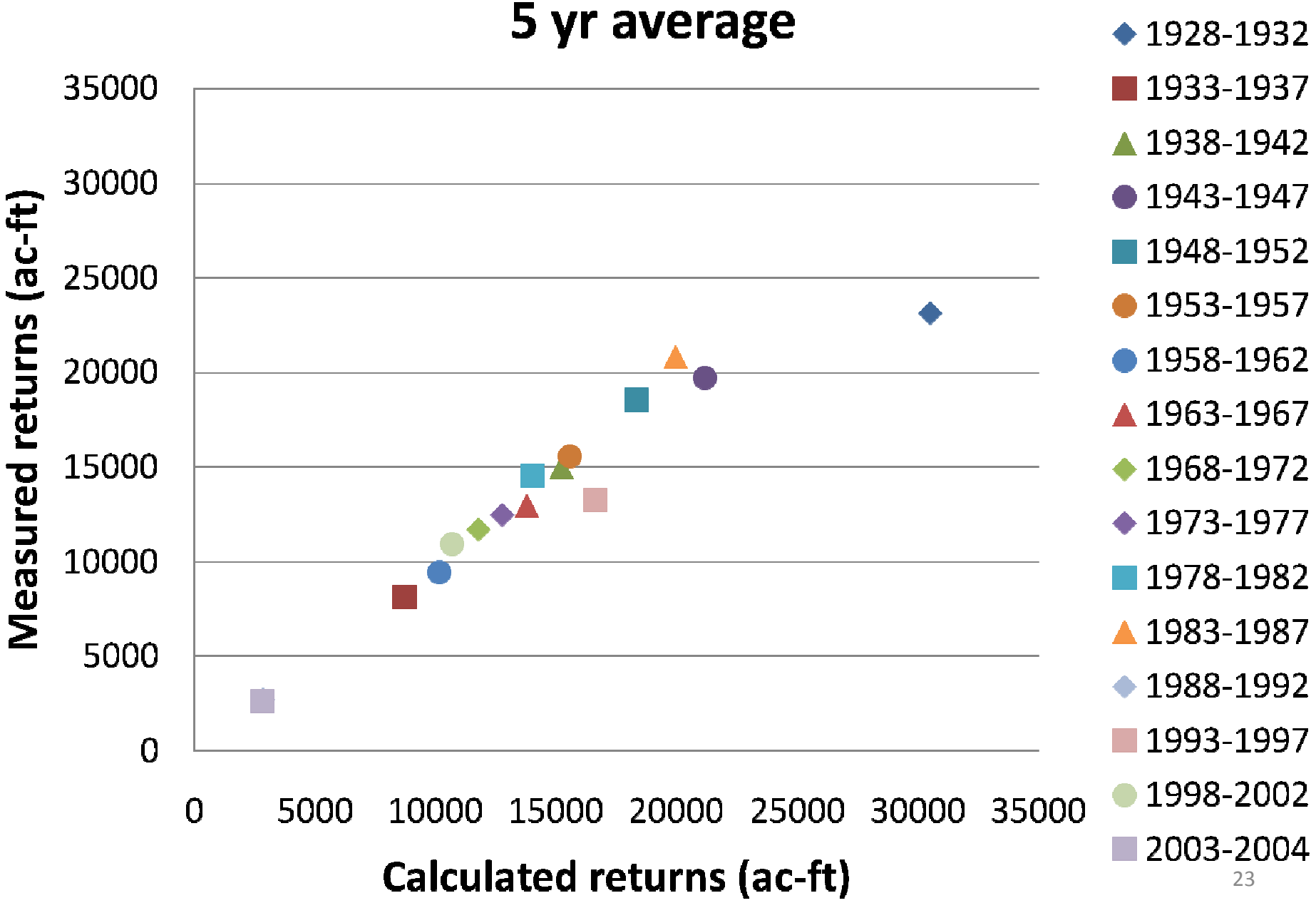
Big Wood: Measured vs. Calculated Returns (5 yr average)

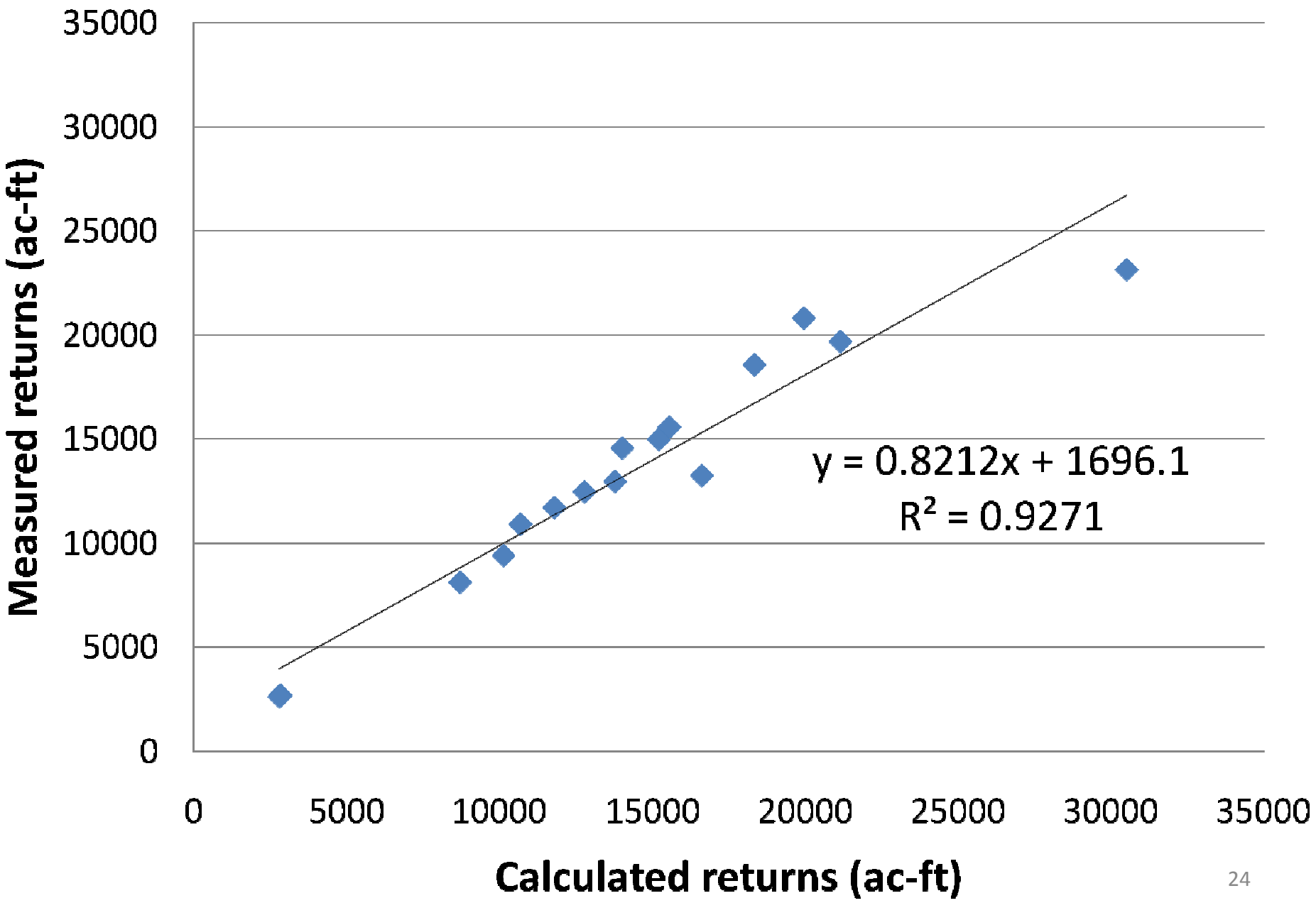


Big Wood: Returns for all groups

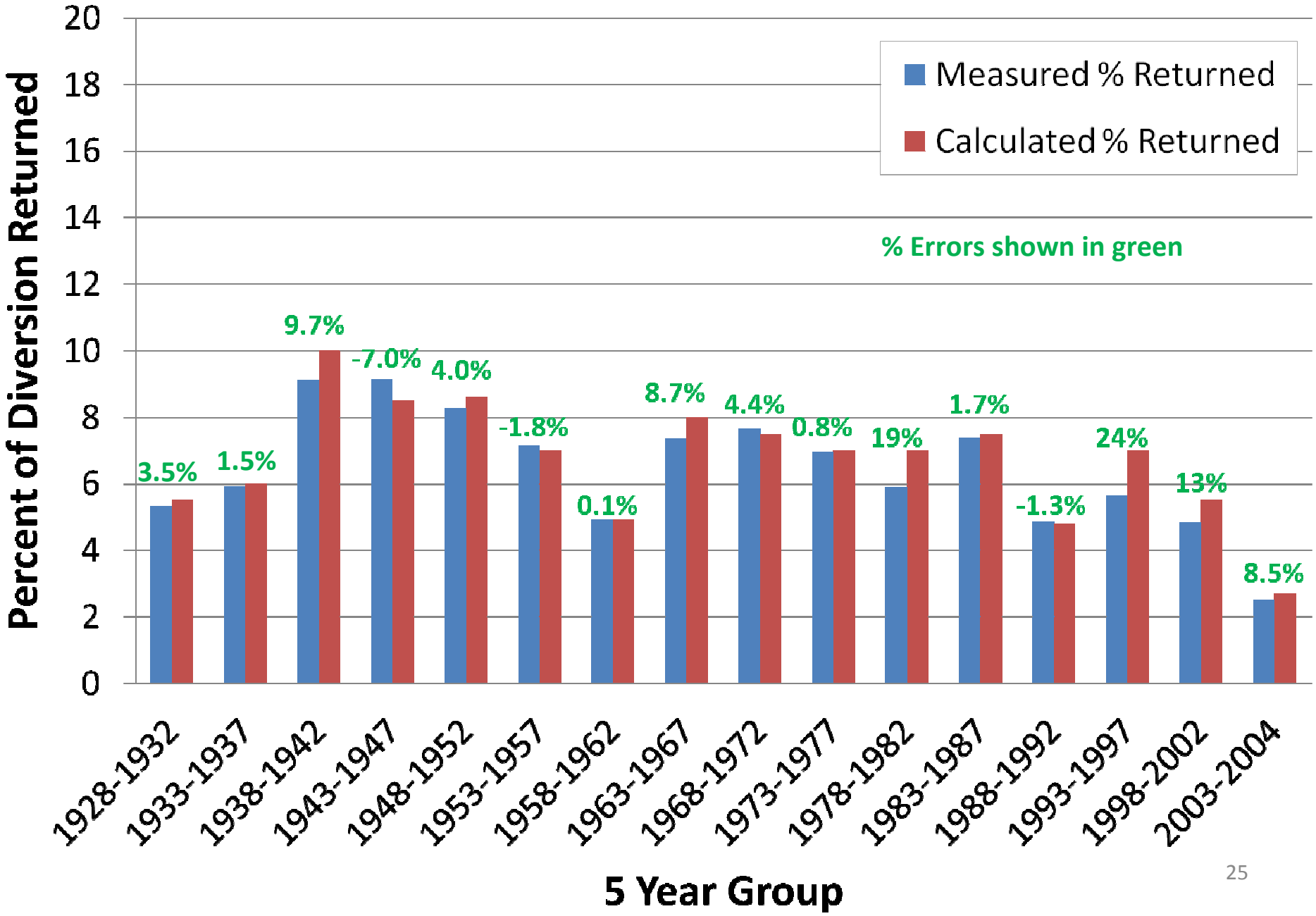


Richfield: Measured vs. Calculated Returns - 5 yr average

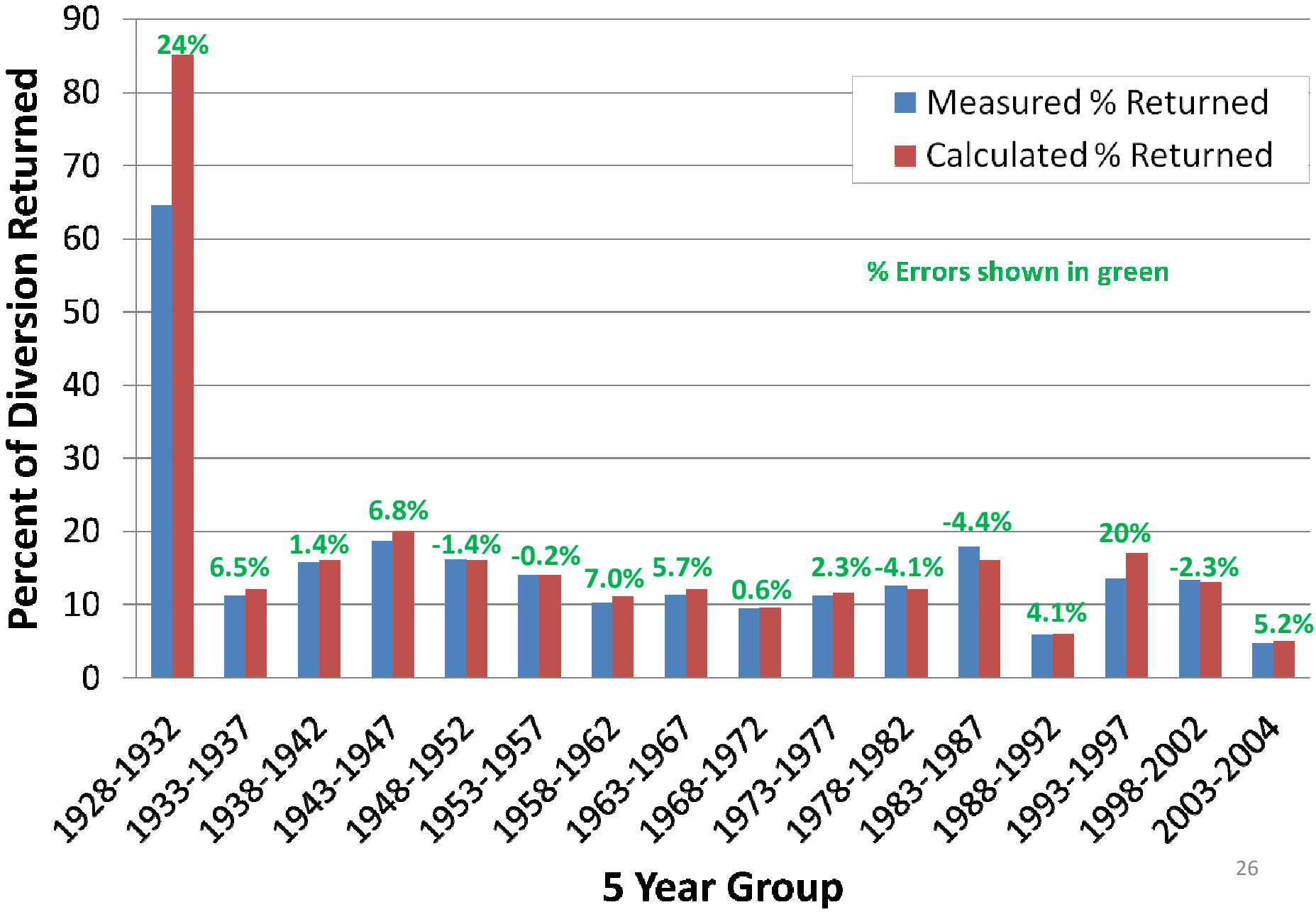



Richfield: Returns for all groups
Measured returns (ac-ft)
35000
30000
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000
25000
30000
35000
Calculated returns (ac-ft)
y = 0.8212x + 1696.1
R² = 0.9271

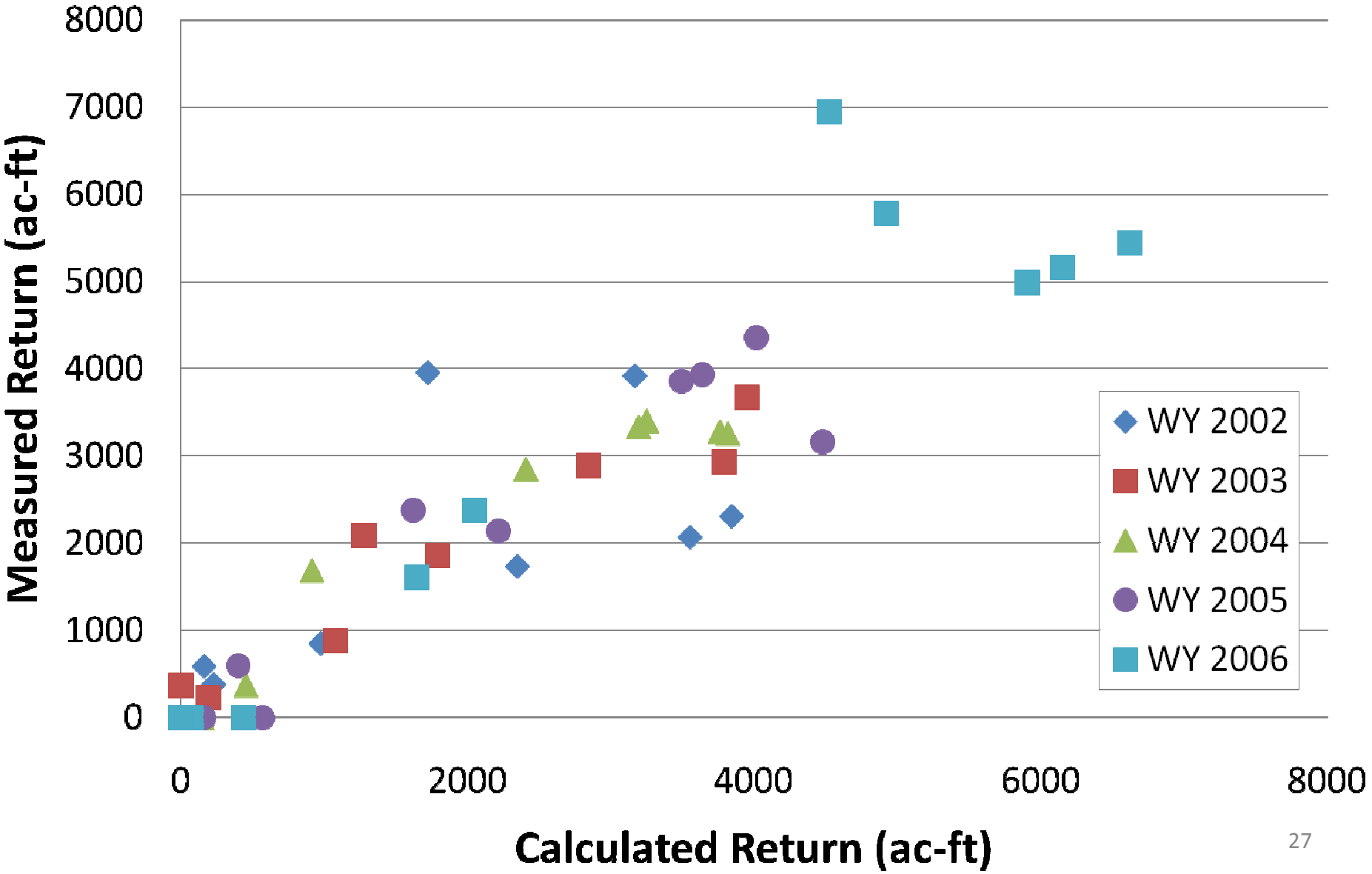
Big Wood: Measured/Calculated % Returned

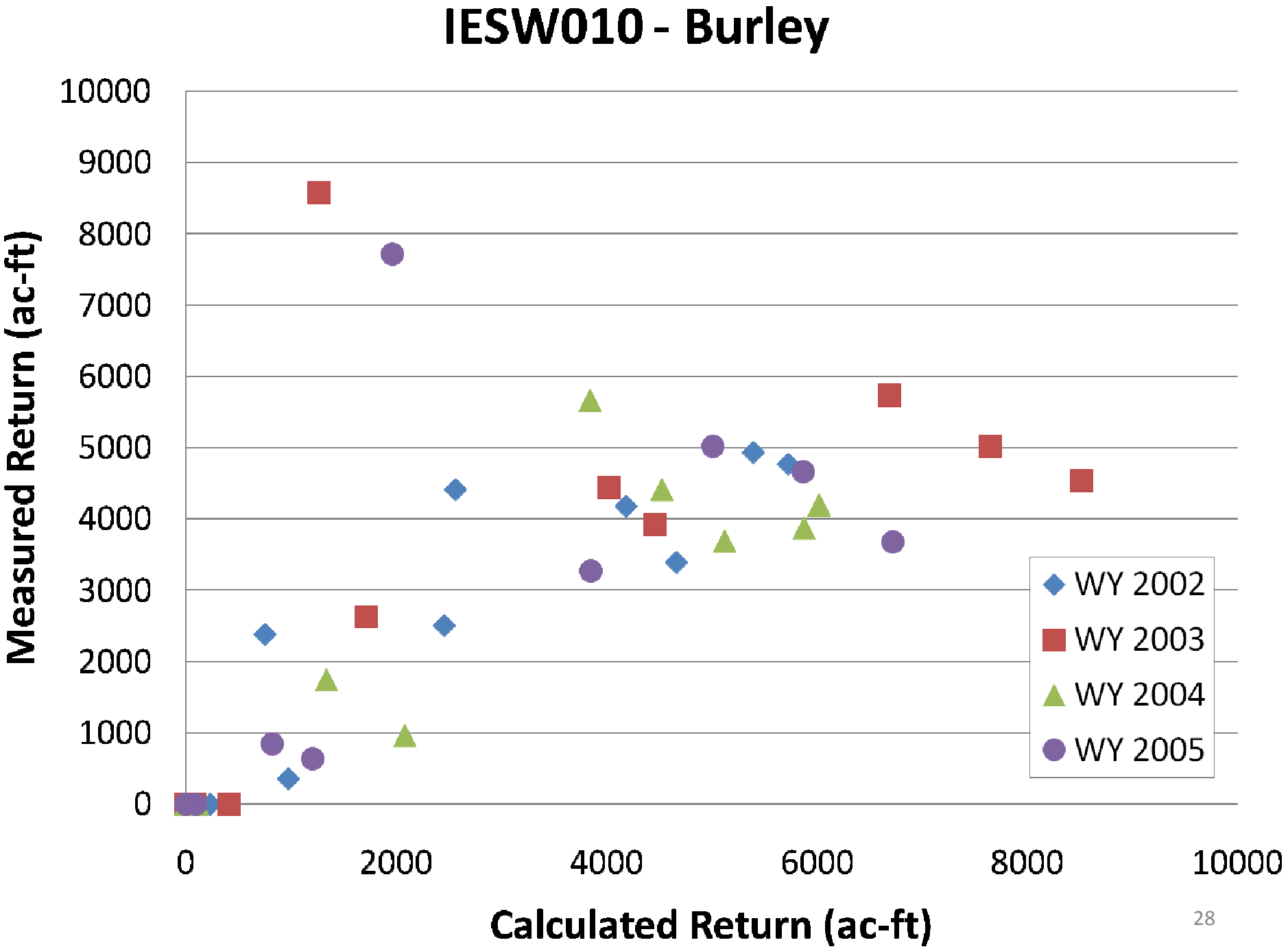


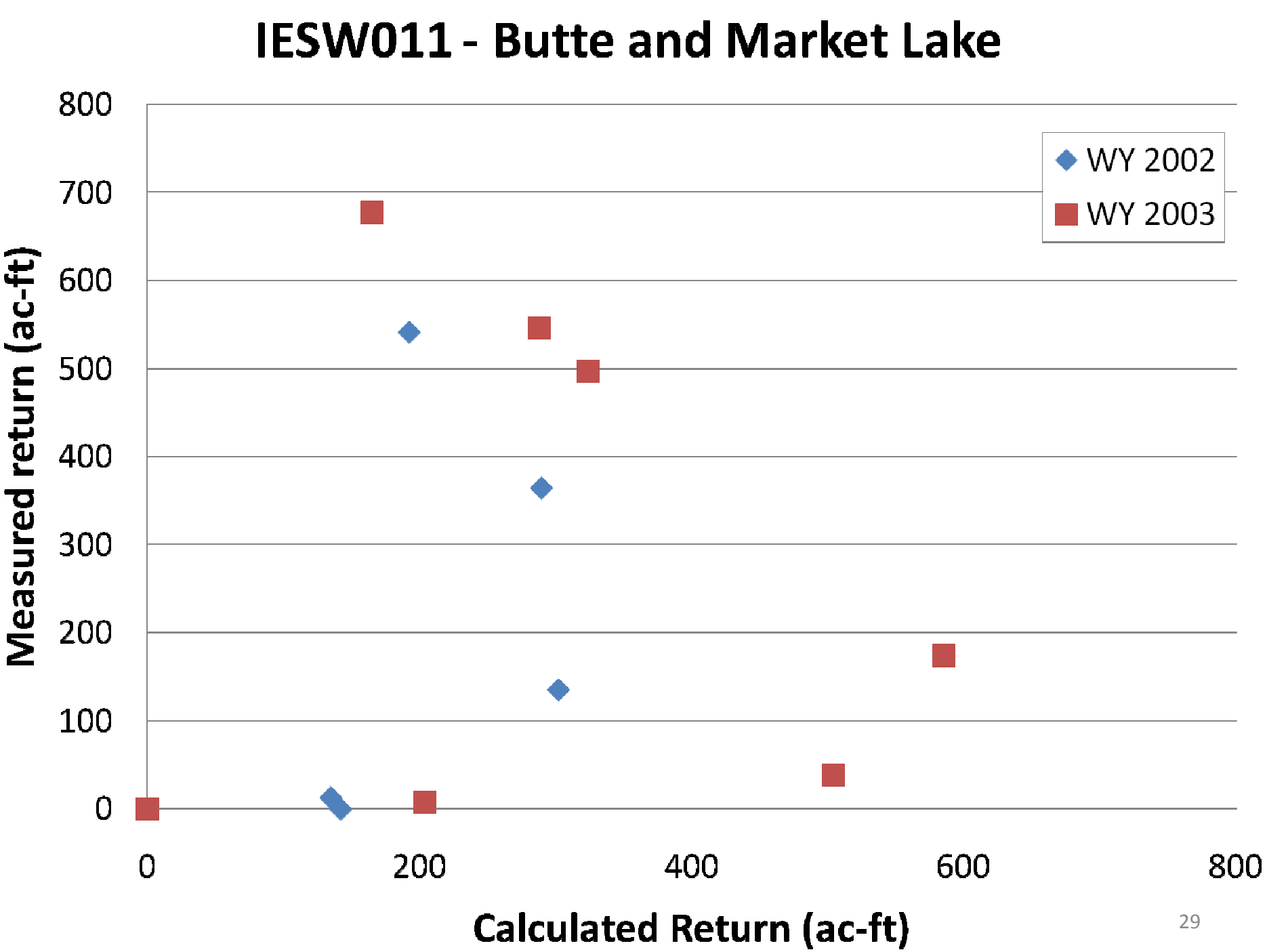
Richfield: Measured/Calculated % Returned

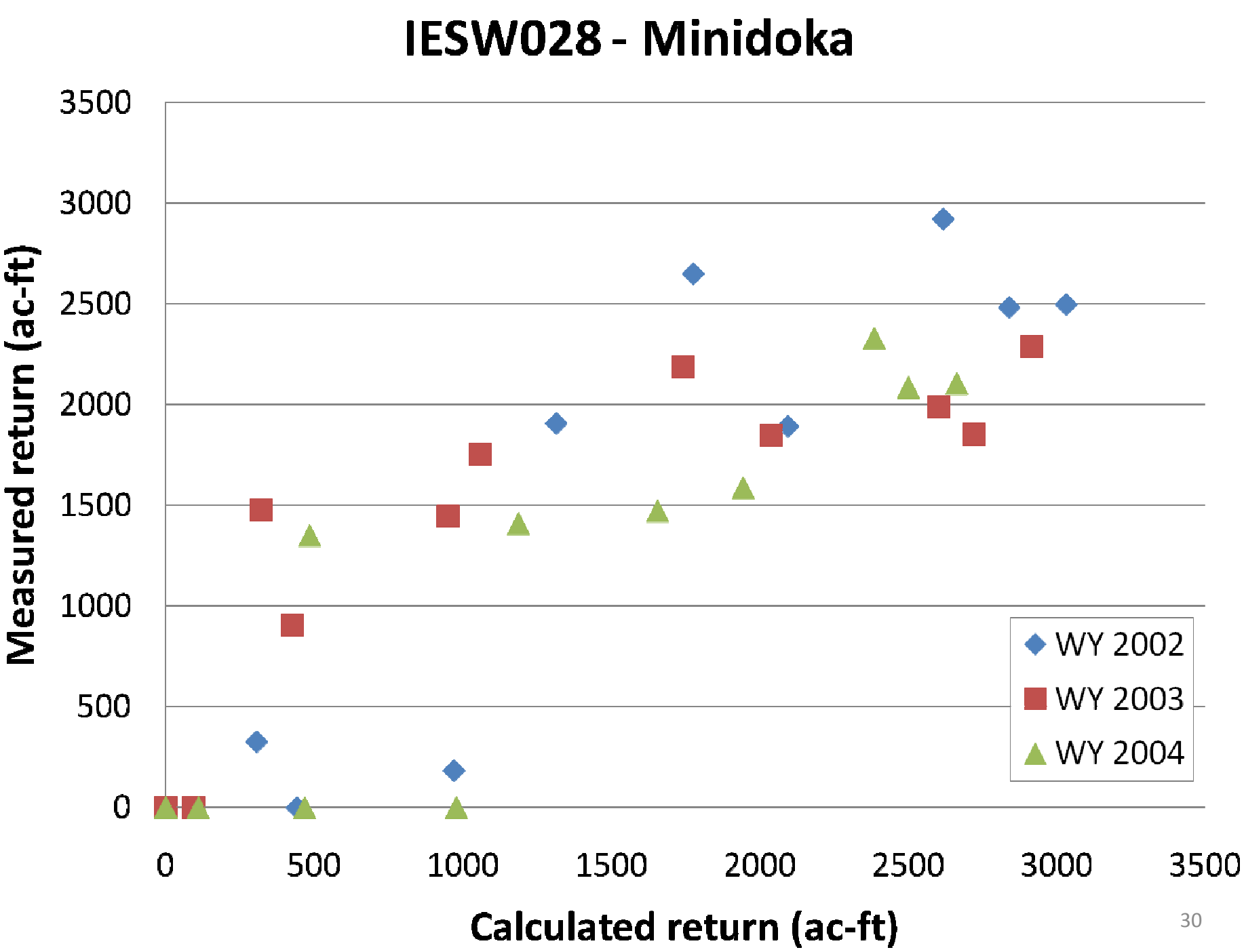


IESW002 - Aberdeen Springfield (Not based on updated)

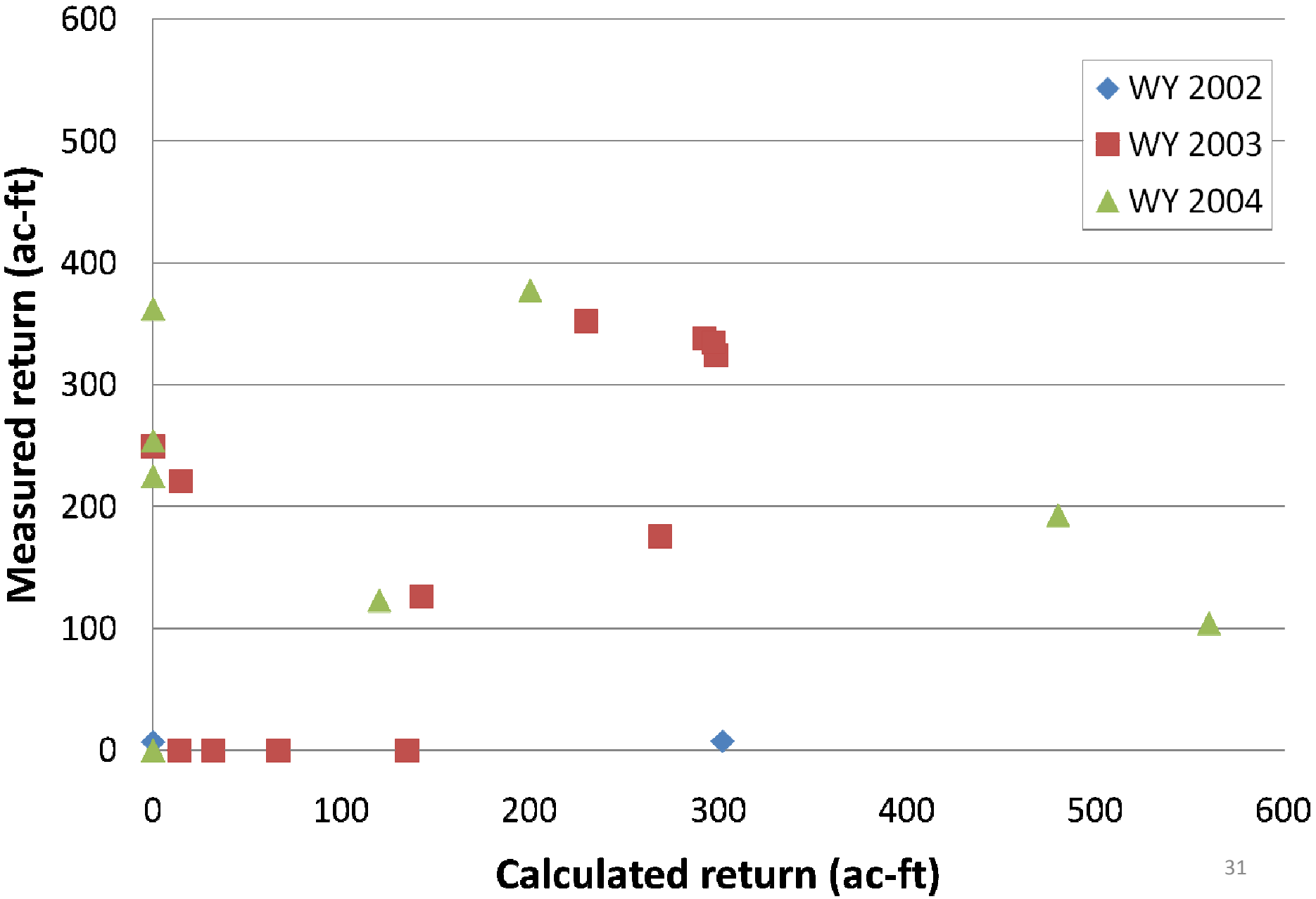


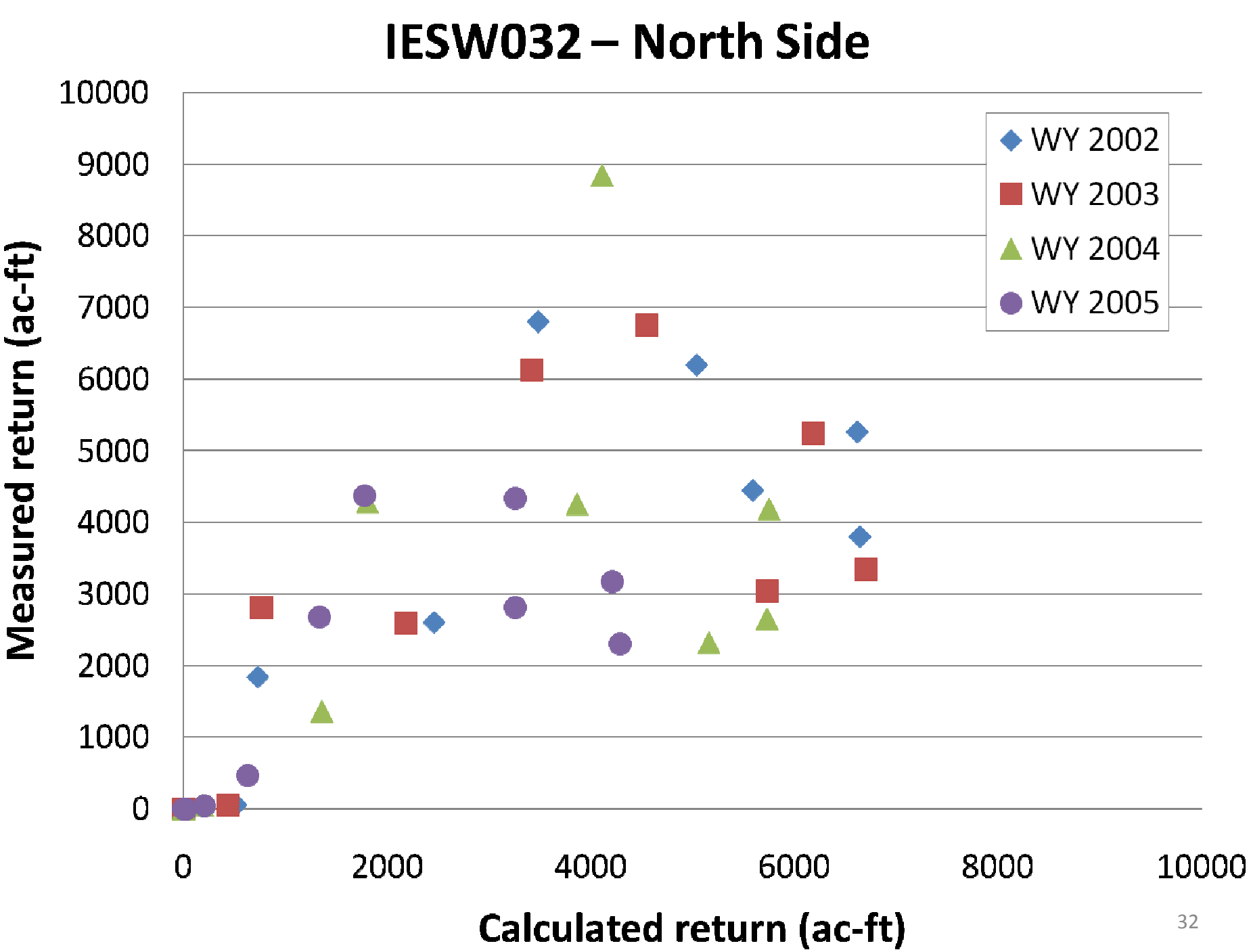

IESW010 - Burley
Measured Return (ac-ft)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
2000
4000
6000
8000
10000
Calculated Return (ac-ft)
WY 2002
WY 2003
WY 2004
WY 2005

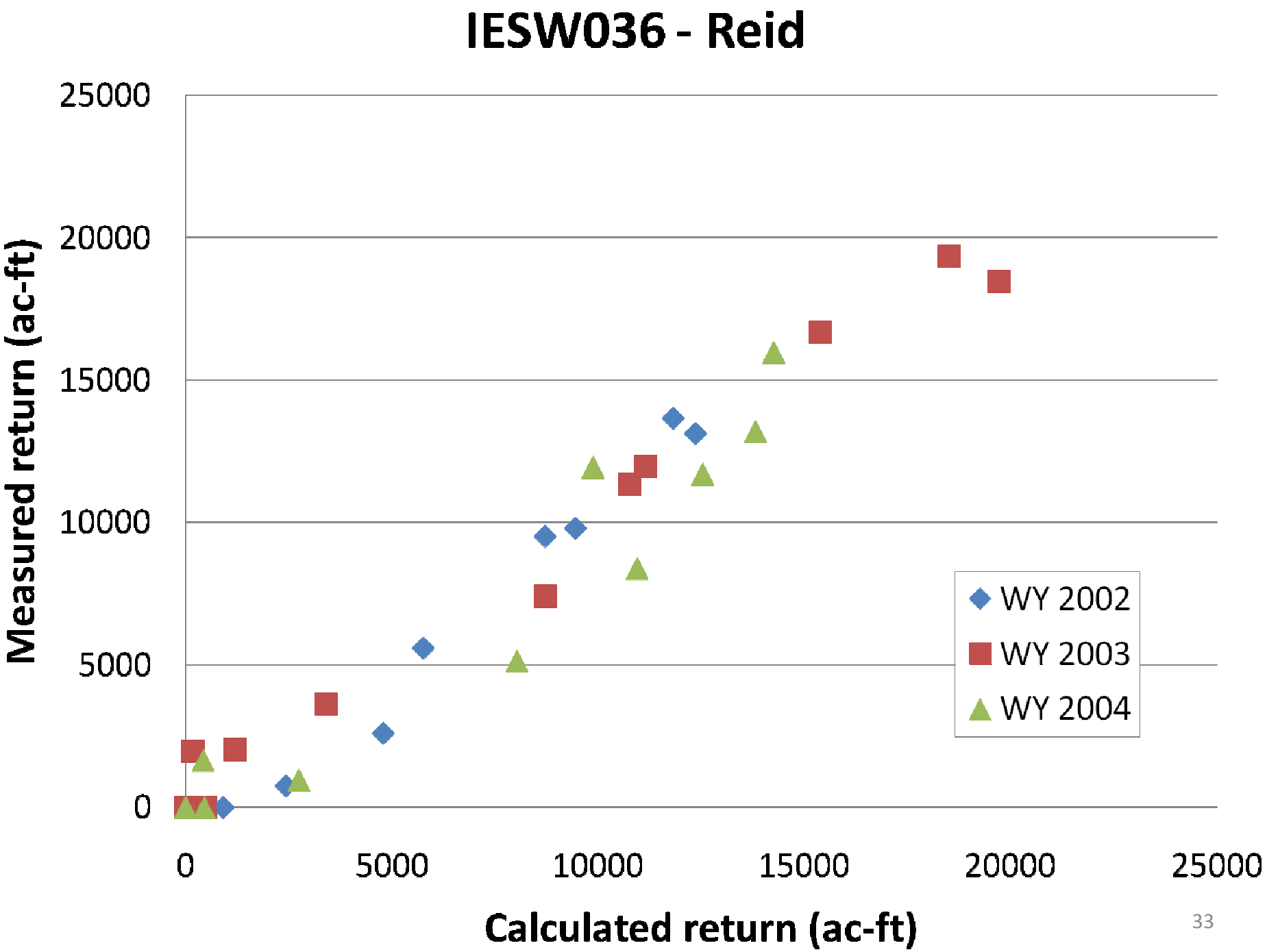

IESW011 - Butte and Market Lake
Measured return (ac-ft)
800
700
600
500
400
300
200
100
0
0
200
400
600
800
Calculated Return (ac-ft)
WY 2002
WY 2003

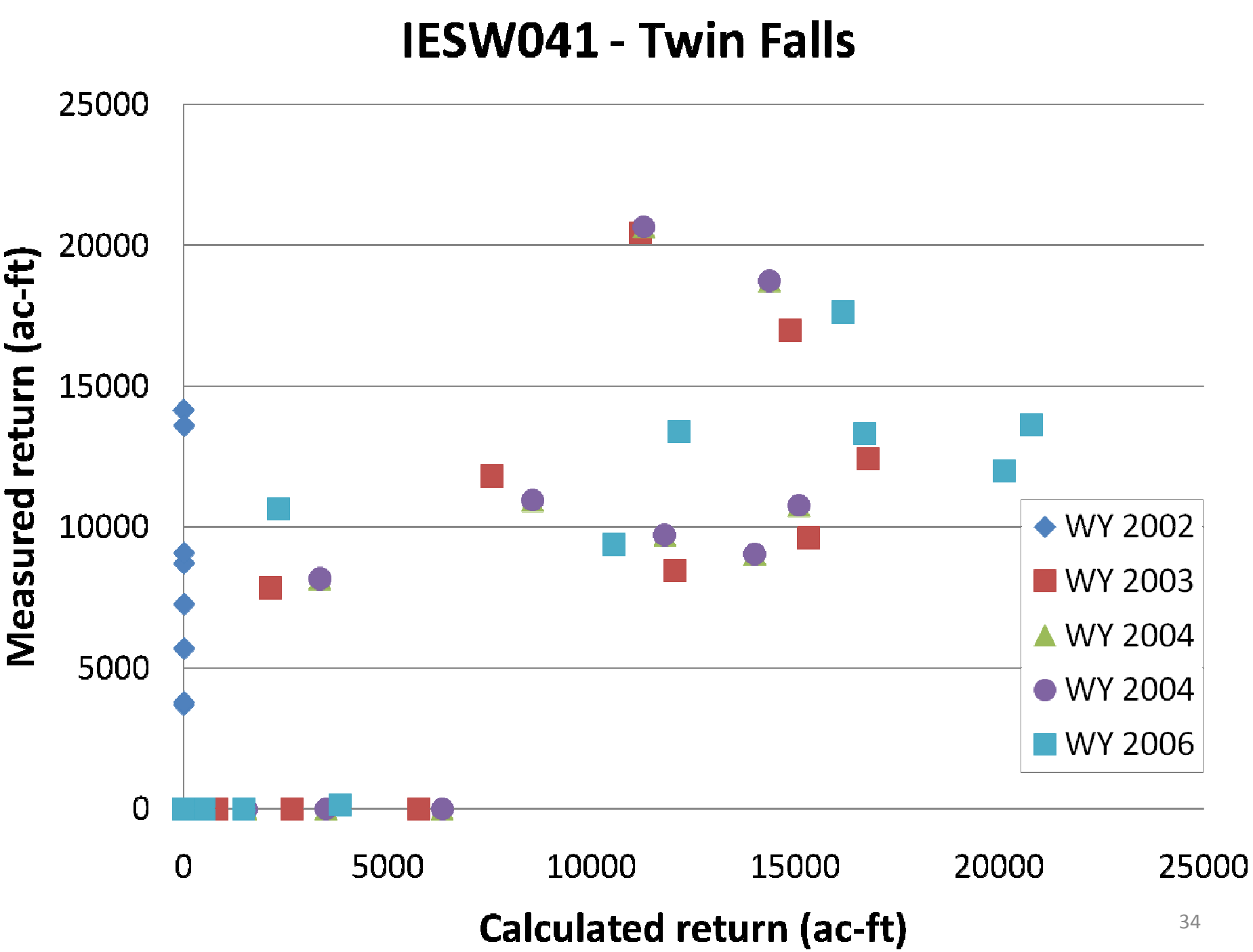

IESW028 - Minidoka
Measured return (ac-ft)
3500
3000
2500
2000
1500
1000
500
0
0
500
1000
1500
2000
2500
3000
3500
Calculated return (ac-ft)
WY 2002
WY 2003
WY 2004

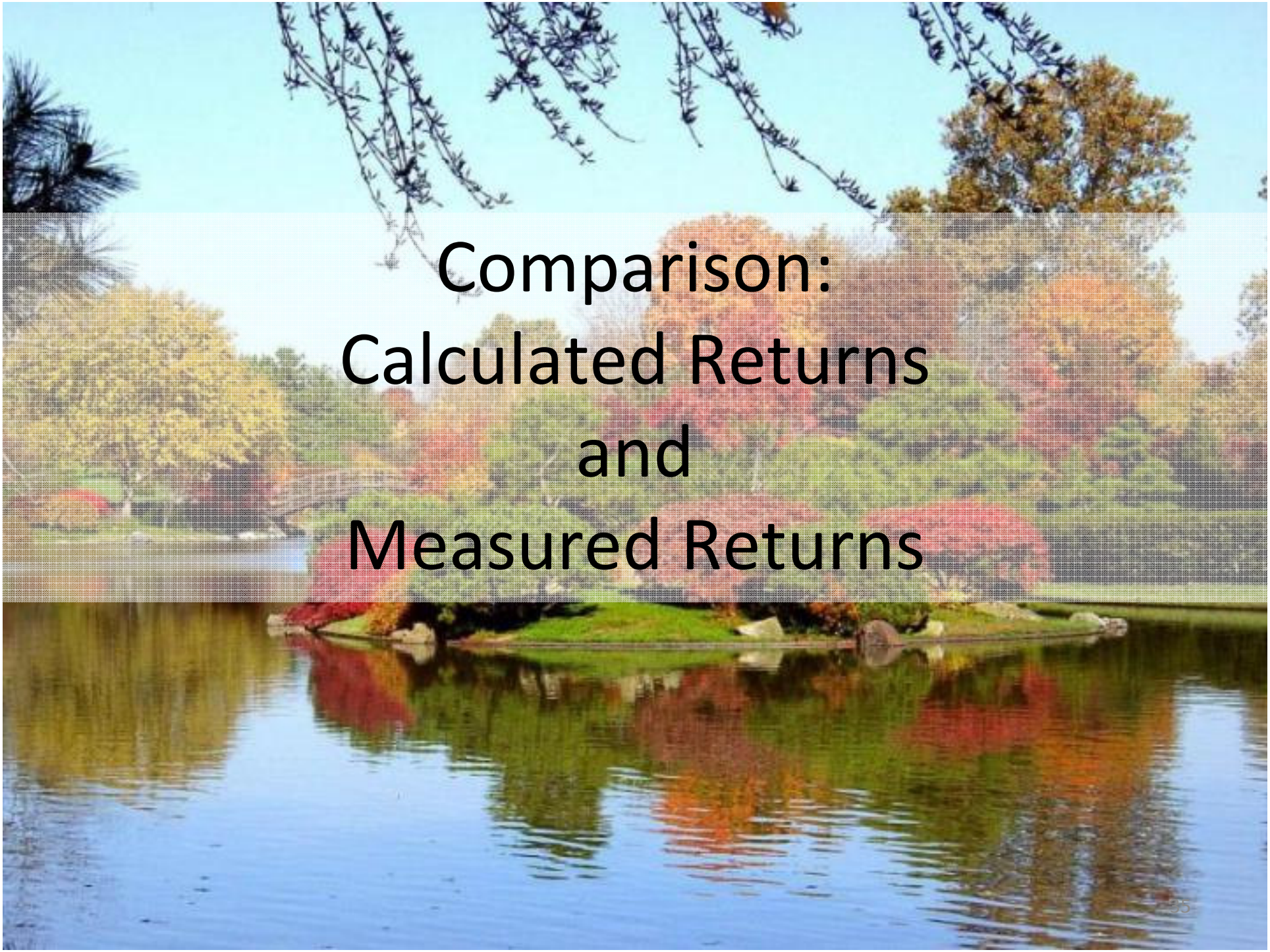
IESW031 – North Freemont



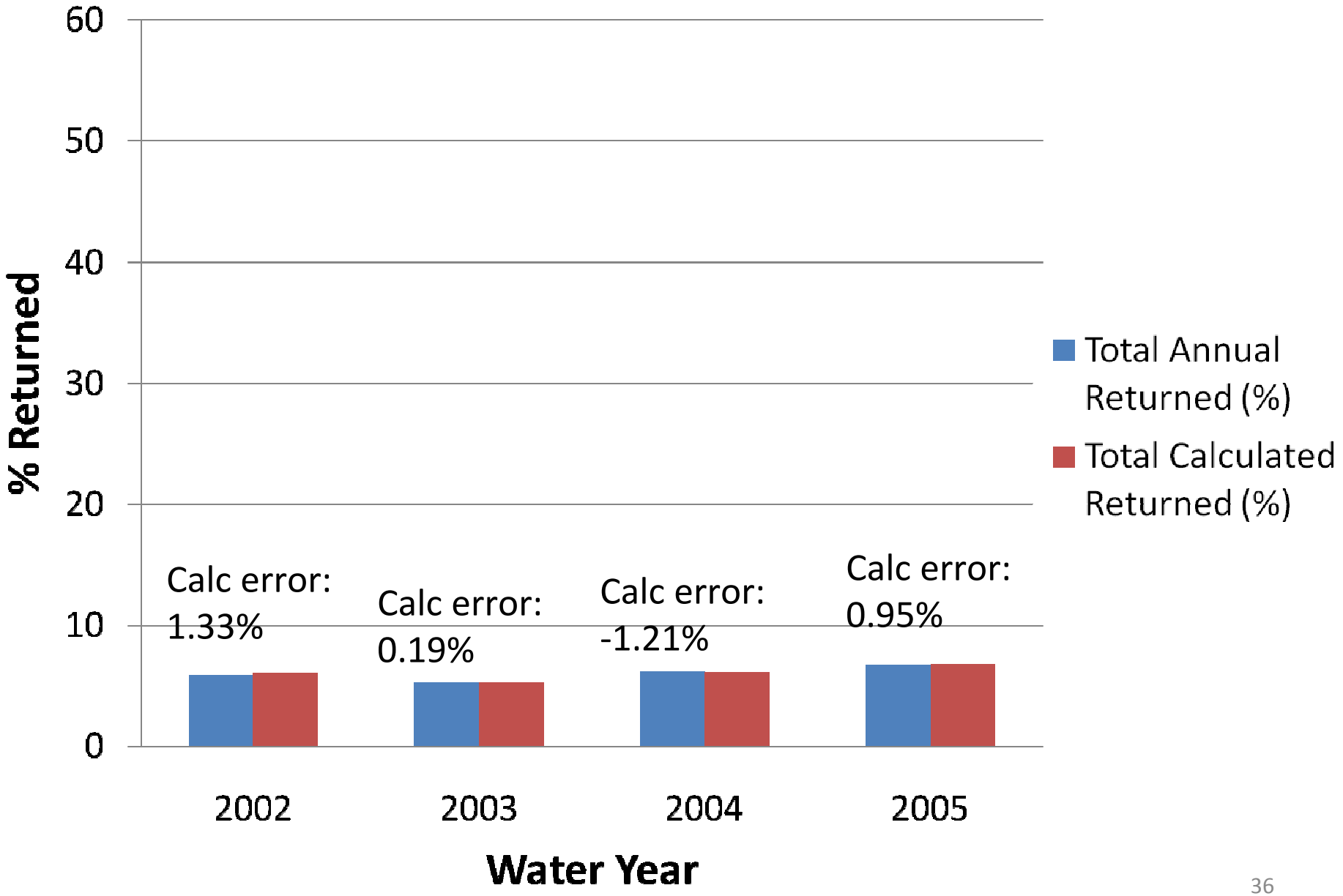

IESW032 – North Side
Measured return (ac-ft)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
2000
4000
6000
8000
10000
Calculated return (ac-ft)
WY 2002
WY 2003
WY 2004
WY 2005

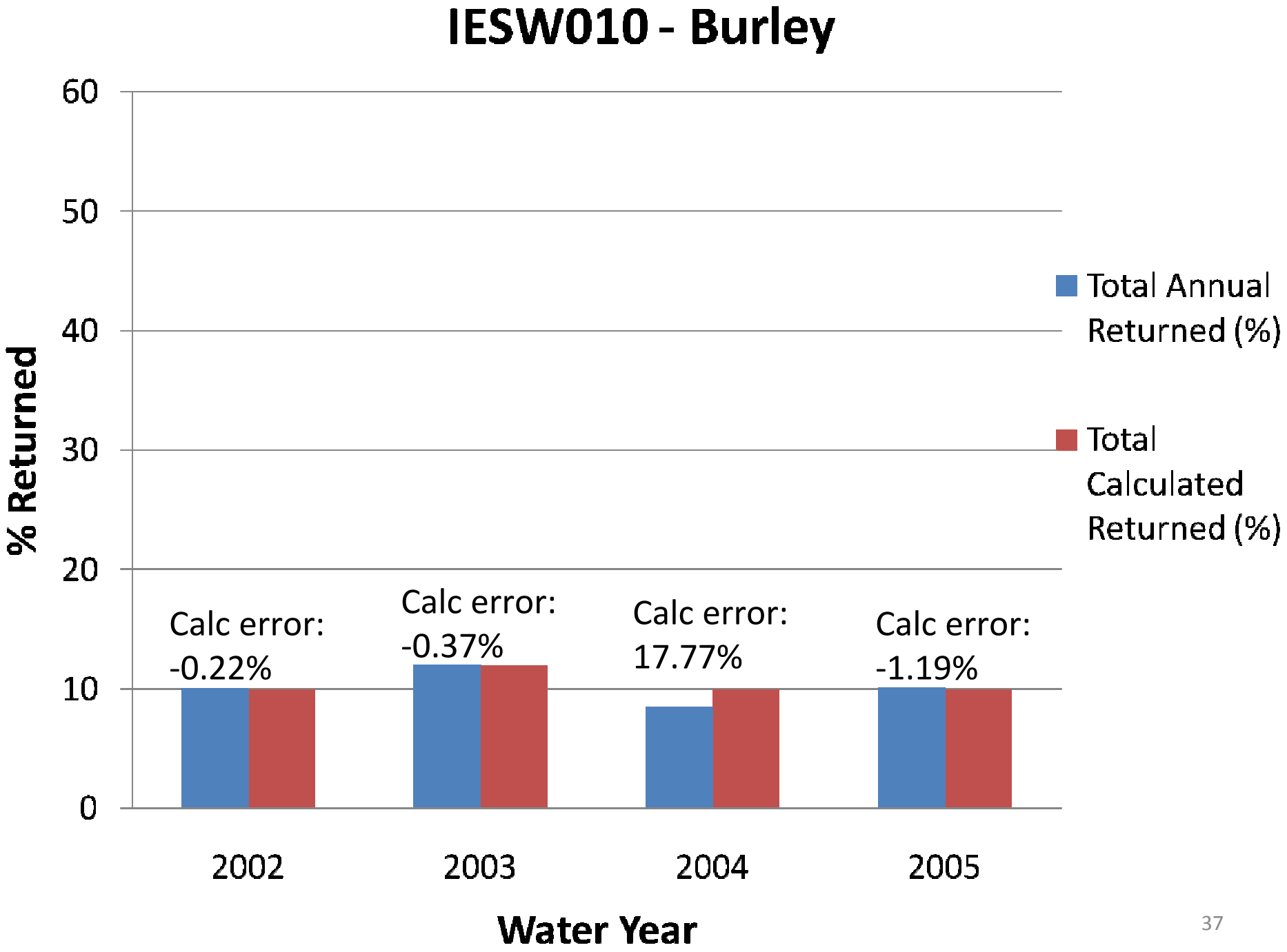

IESW036 - Reid
Measured return (ac-ft)
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000
25000
Calculated return (ac-ft)
WY 2002
WY 2003
WY 2004

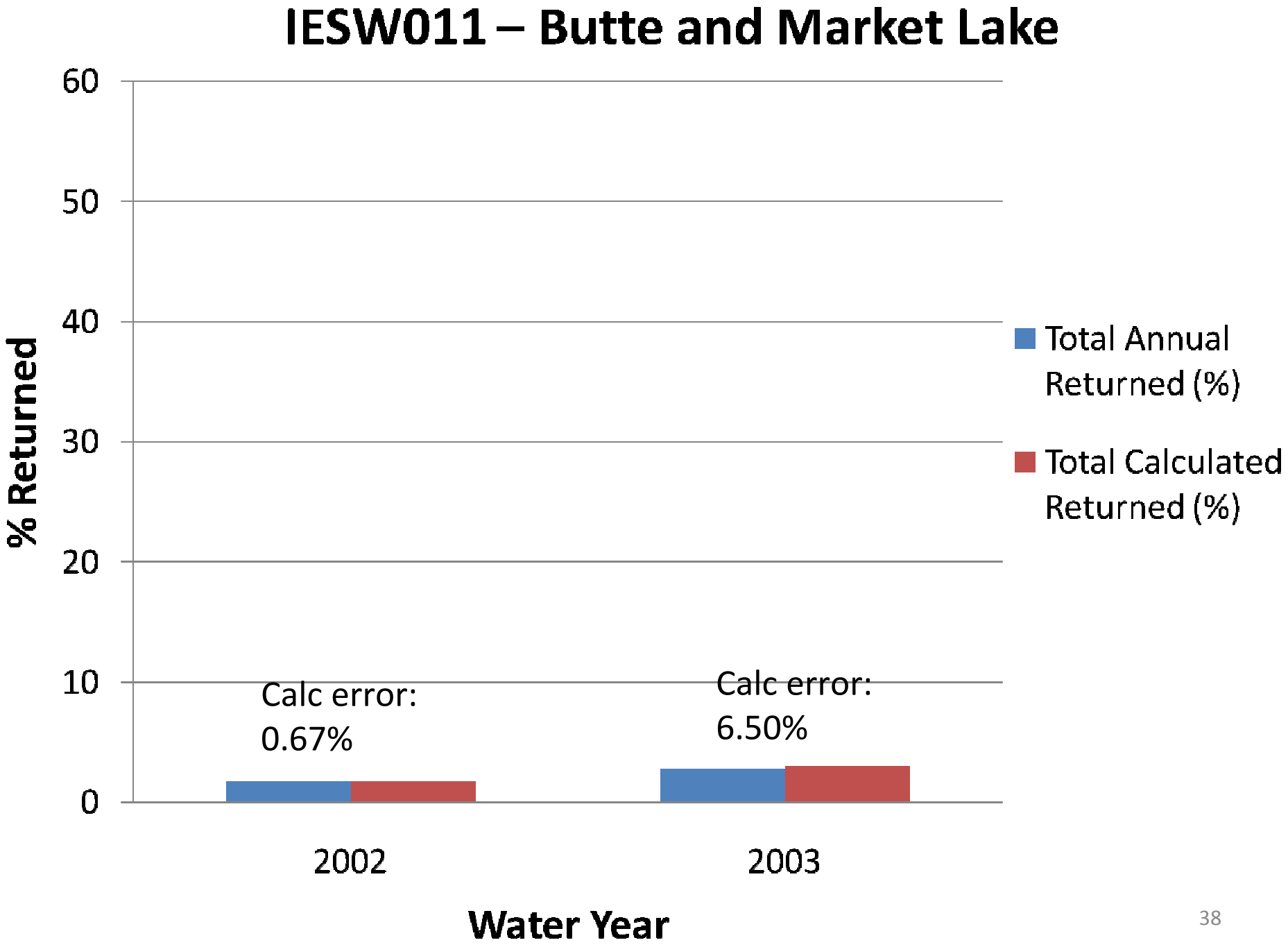

IESW041 - Twin Falls
Measured return (ac-ft)
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000
25000
Calculated return (ac-ft)
WY 2002
WY 2003
WY 2004
WY 2004
WY 2006

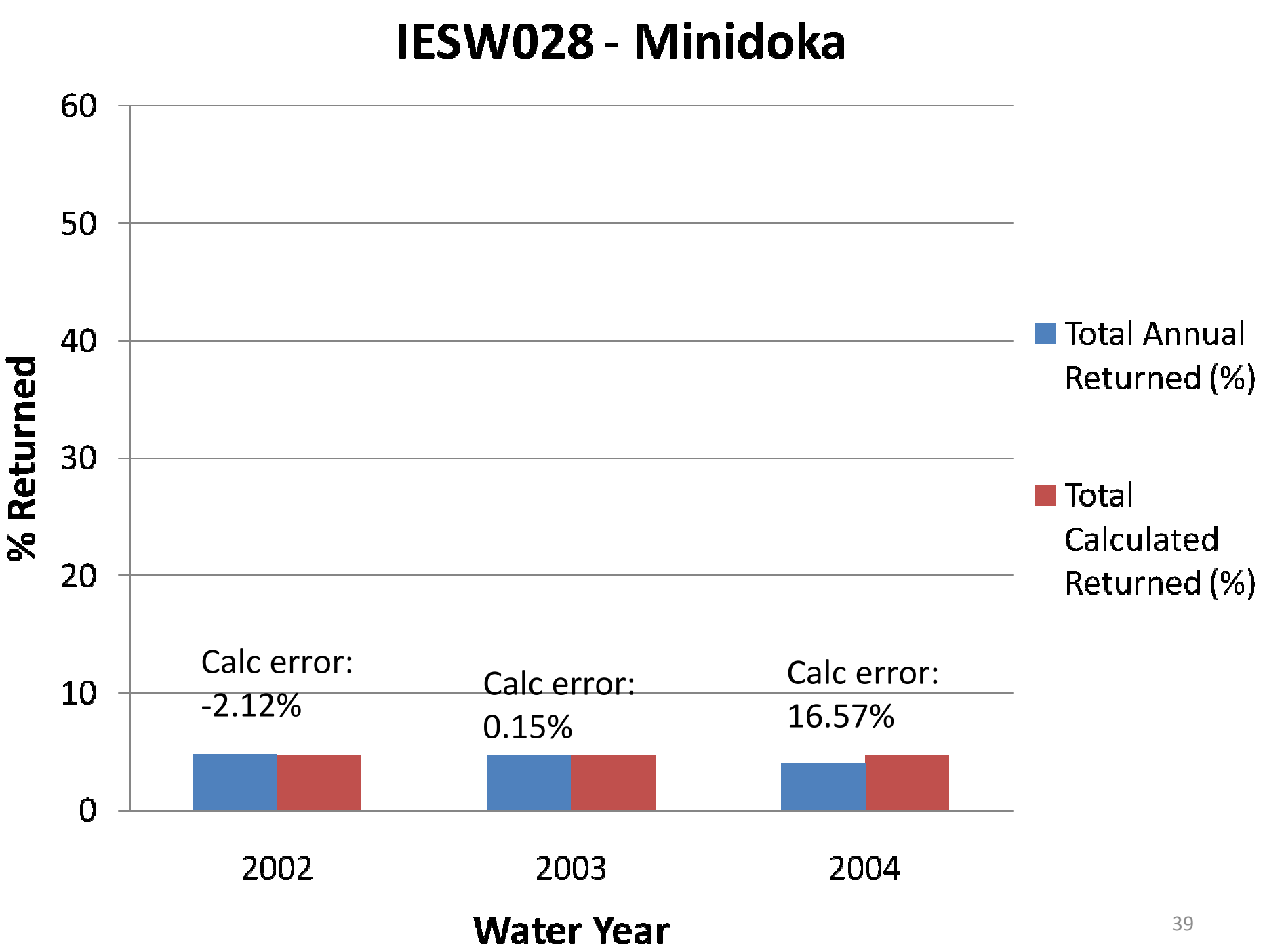

Comparison:
Calculated Returns
and
Measured Returns

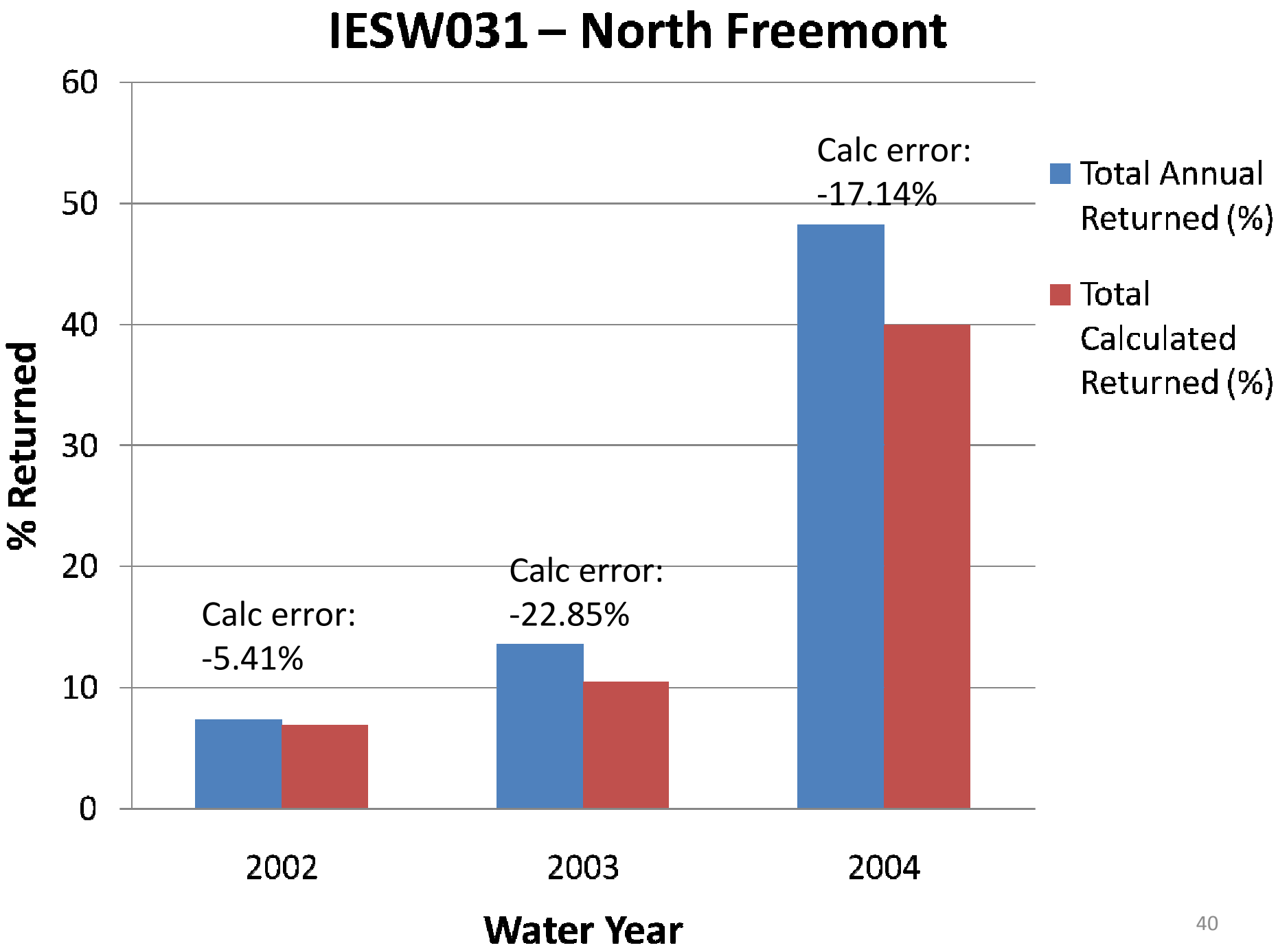
IESW002 – Aberdeen Springfield

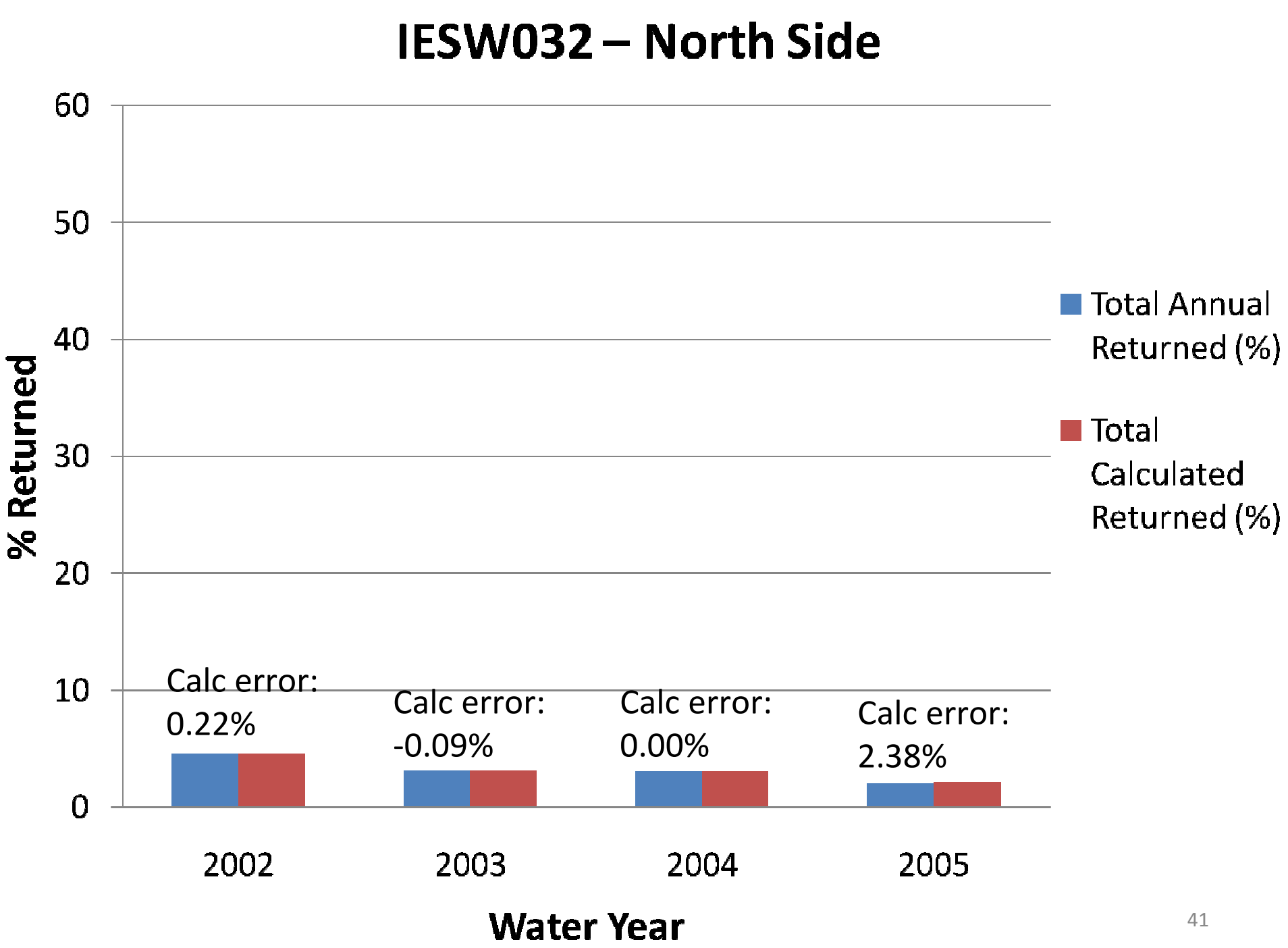


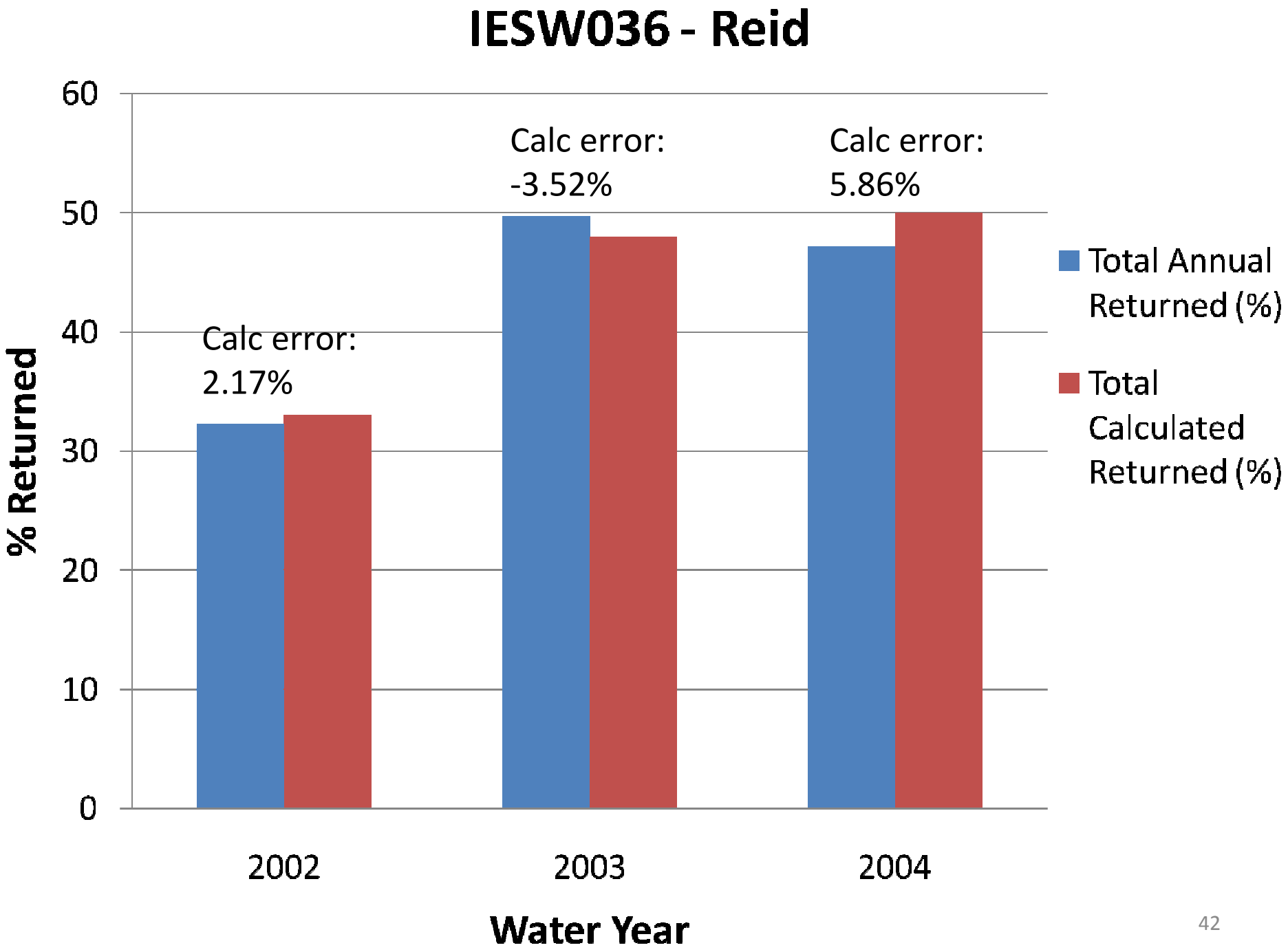

IESW010 - Burley
60
50
40
30
20
10
0
% Returned
Total Annual Returned (%)
Total Calculated Returned (%)
Calc error: -0.22%
Calc error: -0.37%
Calc error: 17.77%
Calc error: -1.19%
2002
2003
2004
2005
Water Year

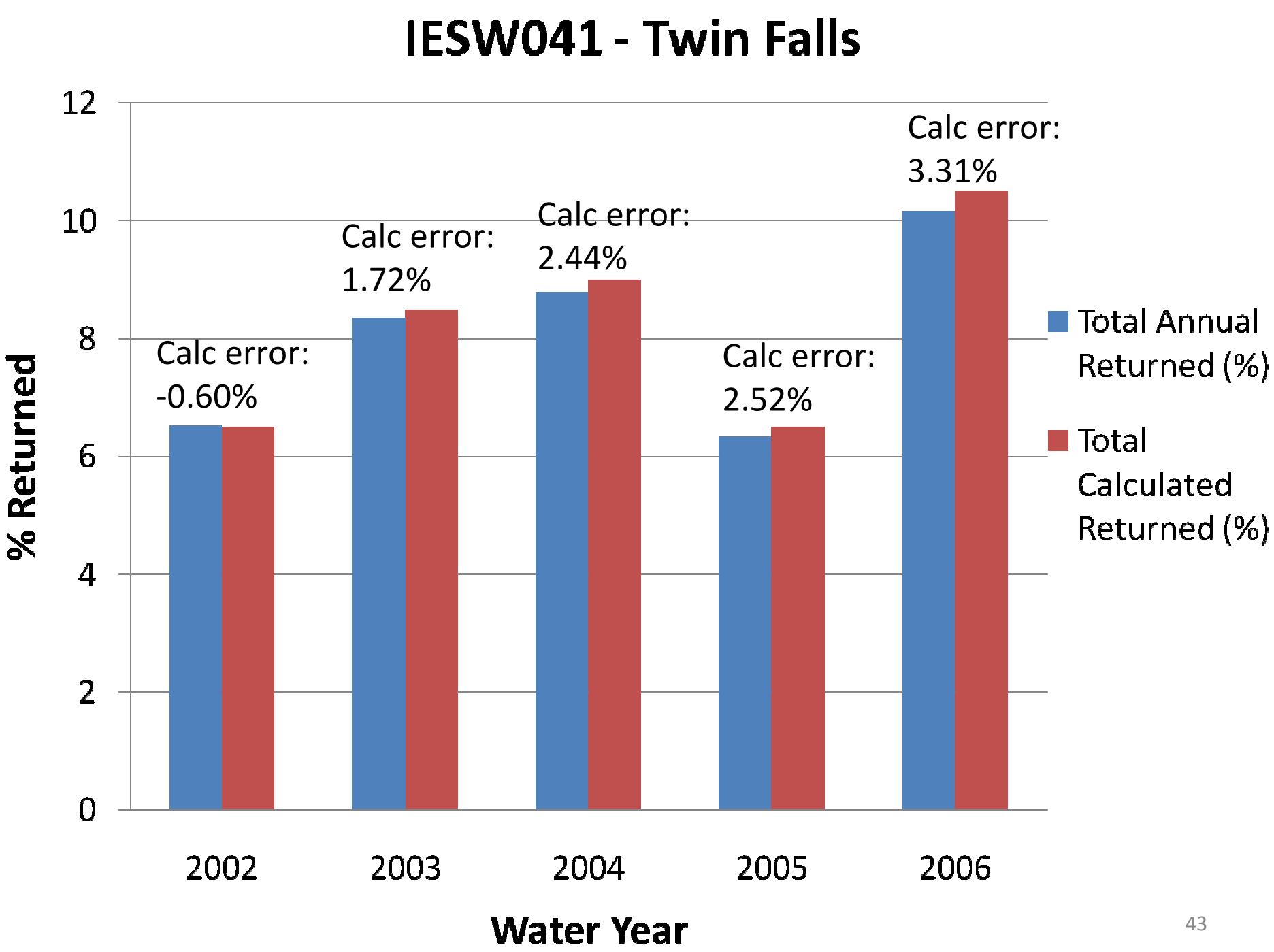

IESW011 – Butte and Market Lake
60
50
40
30
20
10
0
% Returned
Calc error:
0.67%
Calc error:
6.50%
2002
2003
Water Year
Total Annual Returned (%)
Total Calculated Returned (%)


IESW028 - Minidoka
60
50
40
30
20
10
0
% Returned
Calc error:
-2.12%
Calc error:
0.15%
Calc error:
16.57%
2002
2003
2004
Water Year
Total Annual Returned (%)
Total Calculated Returned (%)


IESW031 – North Freemont
60
50
40
30
20
10
0
% Returned
Calc error:
-5.41%
Calc error:
-22.85%
Calc error:
-17.14%
2002
2003
2004
Water Year
Total Annual Returned (%)
Total Calculated Returned (%)


IESW032 – North Side
60
50
40
30
20
10
0
% Returned
Calc error: 0.22%
Calc error: -0.09%
Calc error: 0.00%
Calc error: 2.38%
2002
2003
2004
2005
Water Year
Total Annual Returned (%)
Total Calculated Returned (%)


IESW036 - Reid
60
50
40
30
20
10
0
% Returned
Calc error:
2.17%
Calc error:
-3.52%
Calc error:
5.86%
2002
2003
2004
Water Year
Total Annual Returned (%)
Total Calculated Returned (%)


IESW041 - Twin Falls
12
10
8
6
4
2
0
% Returned
Calc error:
-0.60%
Calc error:
1.72%
Calc error:
2.44%
Calc error:
2.52%
Calc error:
3.31%
2002
2003
2004
2005
2006
Water Year
Total Annual Returned (%)
Total Calculated Returned (%)

Discussion