



Atlas 14 – Precipitation Data Frequency Server Rainfall Distributions

April 23, 2013

MnDOT Bridge Hydraulics

Your Destination...Our Priority



Atlas 14 – Rainfall Distribution

- ▶ A rainfall distribution can be developed directly from the Atlas 14 Rainfall Information



Steps in developing a nested distribution

- ▶ Determine ratios of x hour / 24 hour rainfall.
- ▶ Place the rainfall ratio for the shortest duration in the center of the distribution.
- ▶ Symmetrically place each larger duration to include the shorter durations.

(From NRCS Presentation)



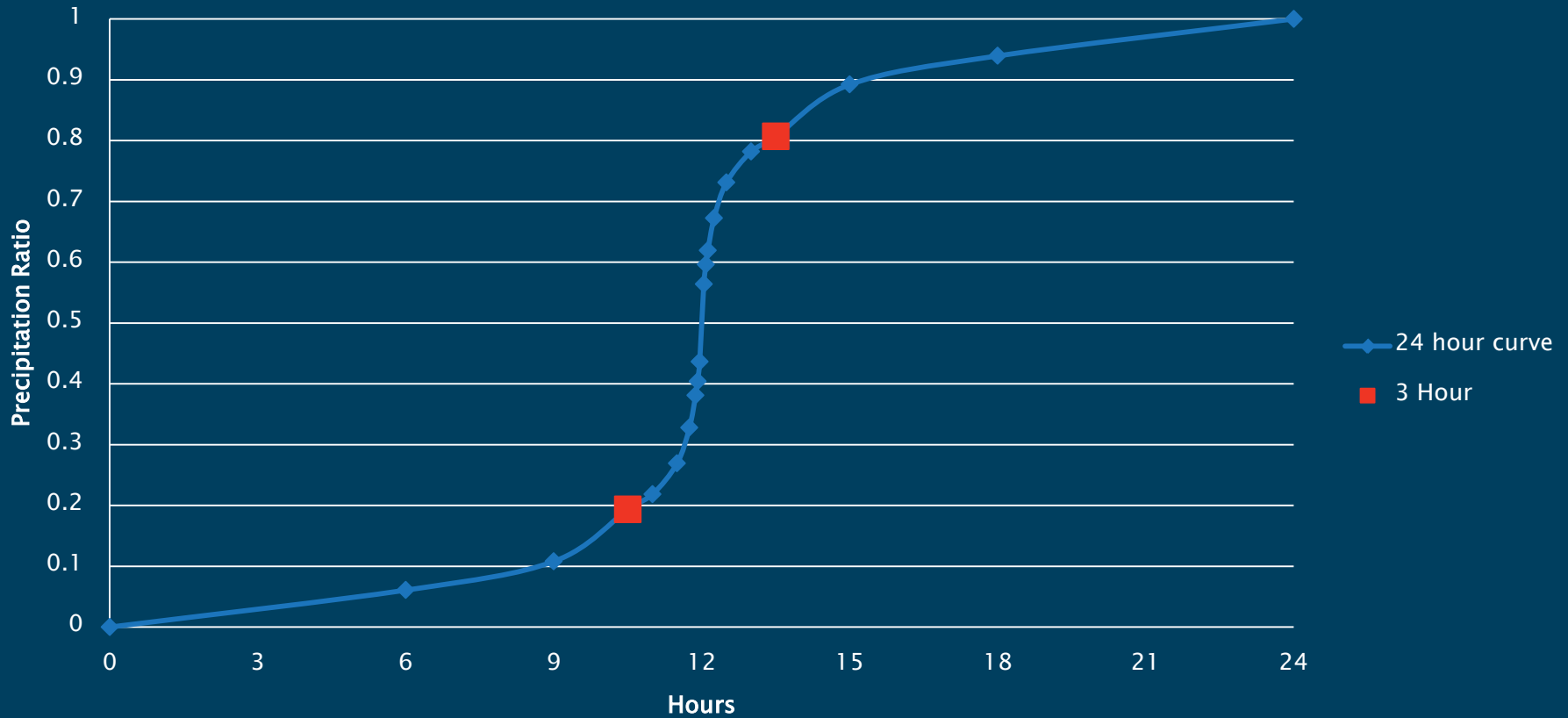
Example Calculation

- ▶ 24 Hour total = 6.67
- ▶ 3 Hour total = 4.09
 - $4.09/6.67 = 0.613$
 - Centered around Precipitation ratio of 0.5 and Time of 12, ordinates are (10.5,0.193) and (13.5,0.806)
- ▶ 6 Hour total = 5.23
 - $5.23/6.67 = 0.784$
 - Ordinates are: (9,0.108) and (15,0.0.892)



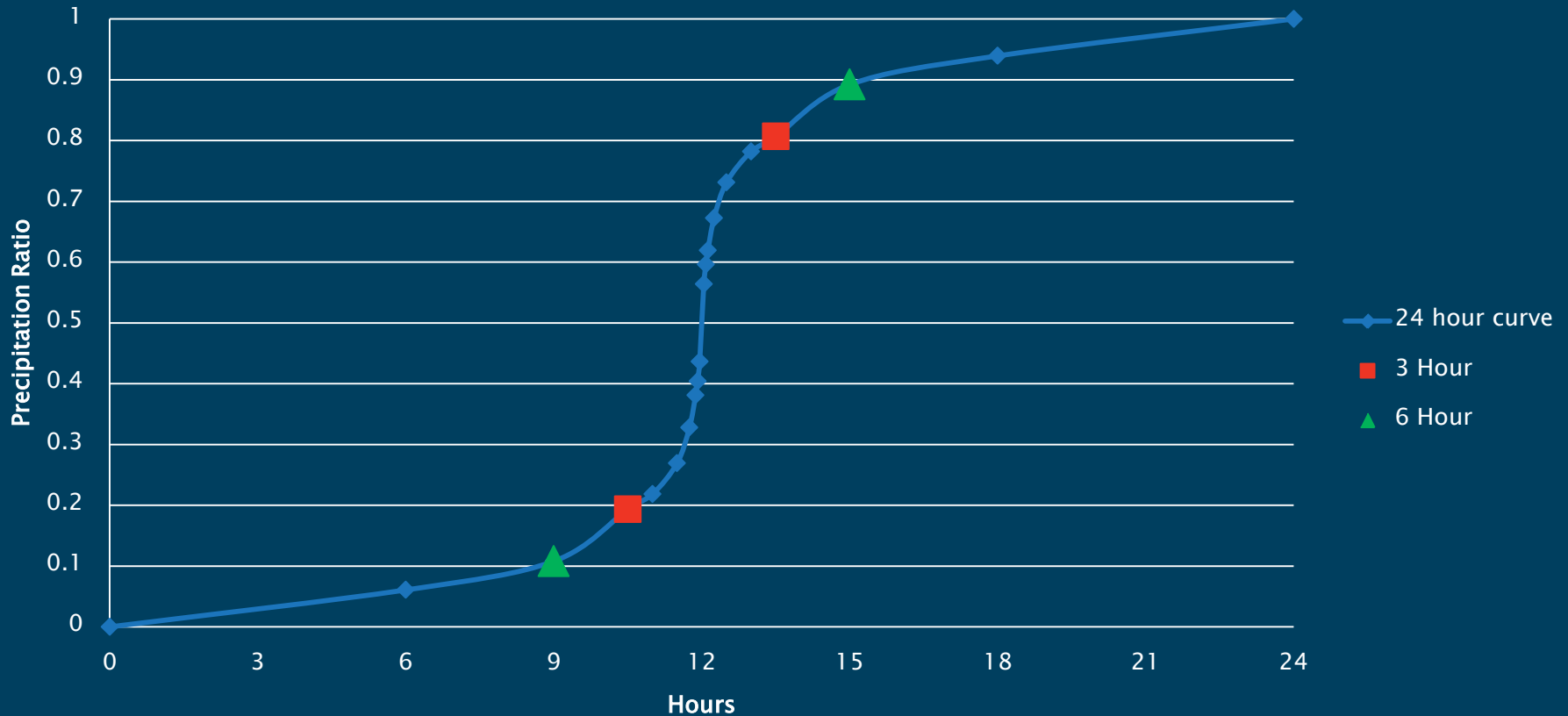
Example of a Nested Distribution

Atlas 14 24 hour– 100 year nested distribution



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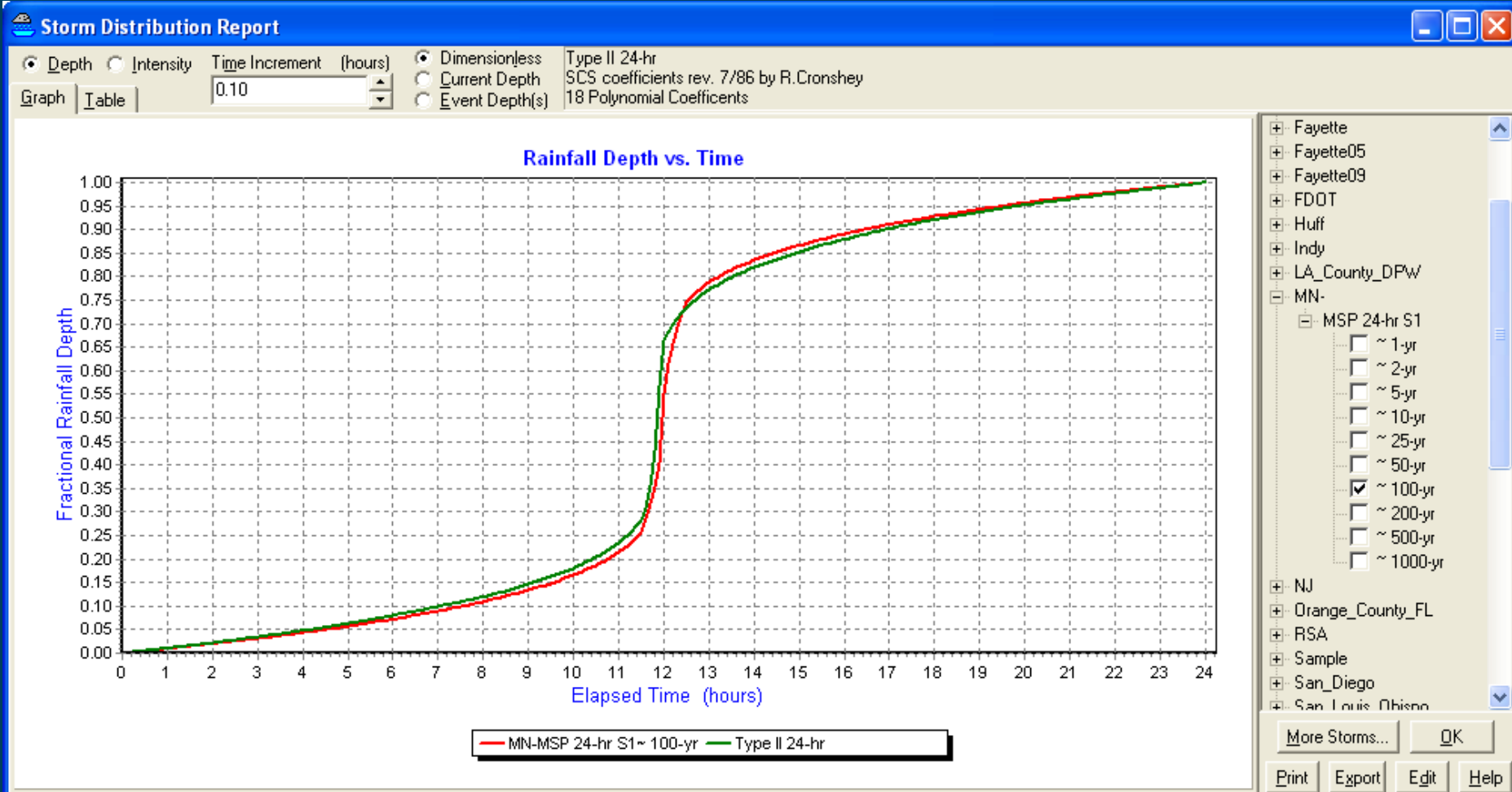


Atlas 14 vs. NRCS Type II Distributions

- ▶ Standard NRCS Type II distribution developed in 1960's
- ▶ NRCS is adopting NOAA Atlas 14 in the states where it is applicable
- ▶ WinTR-20 has been updated to use Atlas 14 rainfall distribution
- ▶ NRCS has developed new rainfall distributions to use with peak flow method for Ohio River Valley states where Atlas 14 was released in 2006



Atlas 14 Minneapolis St. Paul Airport vs. SCS Type II



Atlas 14 vs. NRCS Type II Distributions

- ▶ Recommend using Atlas 14 derived rainfall distribution when using NRCS method
- ▶ If that is not feasible, use the NRCS Type II distribution.
- ▶ NRCS may in future have rainfall distribution curves derived from Atlas 14 for Minnesota
- ▶ See NRCS Websites for further information on NRCS rainfall distributions

<http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/manage/?cid=stelprdb1042793>

<http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/?ss=16&navtype=BROWSEBYSUBJECT&cid=stelprdb1042901&navid=1401000000000&position=Not%20Yet%20Determined.Html&ttype=detailfull>



Using Atlas 14 Data in HydroCAD

- ▶ HydroCAD 10 will import PFDS data and can create rainfall distributions from the Atlas 14 data
- ▶ Good Help Information on HydroCAD Web Site <http://hydrocad.net/rainfall/pfd.htm>
 - Help Sheet
 - Webinar on Rainfall

