



Atlas 14 – Precipitation Data Frequency Server Rainfall Distributions

Dec, 2015

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)



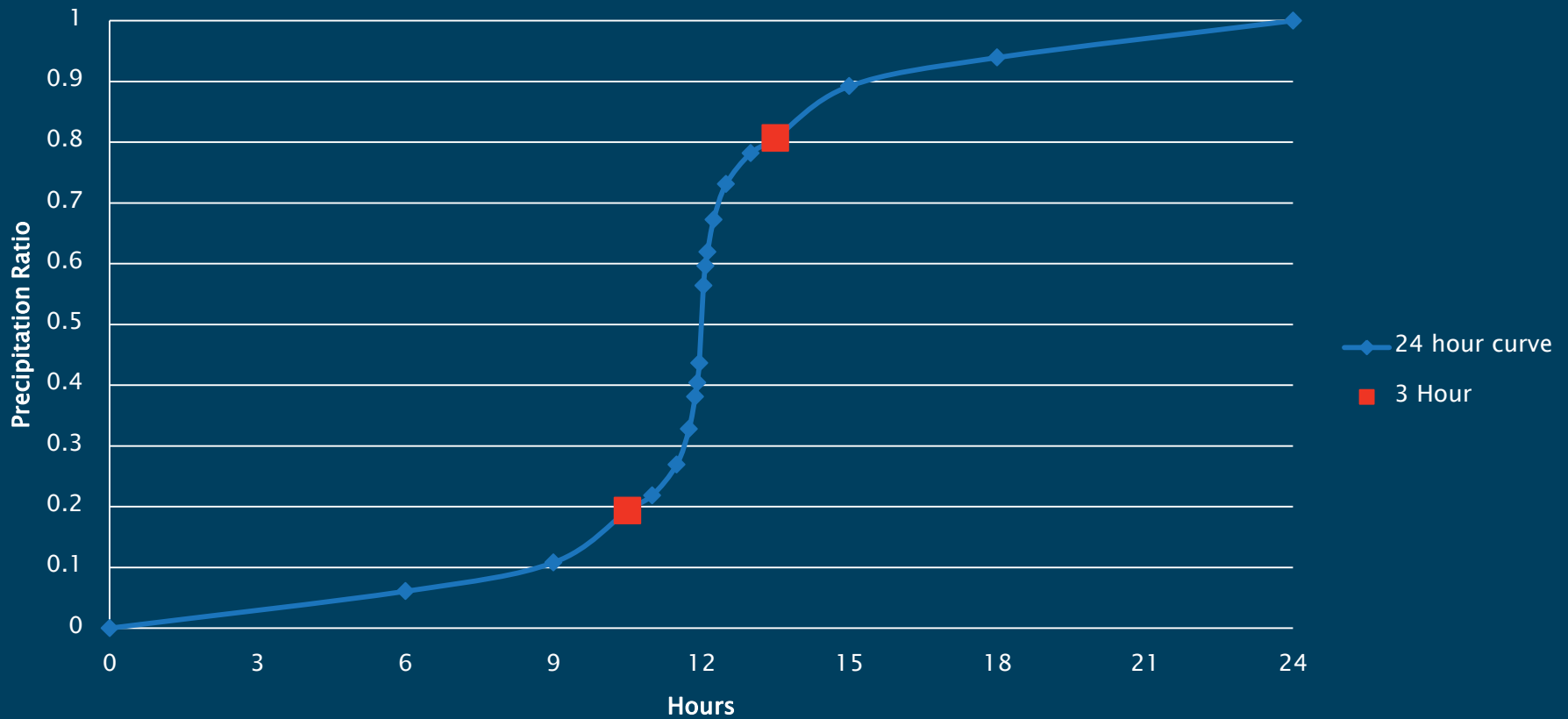
Example Calculation

- ▶ 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)



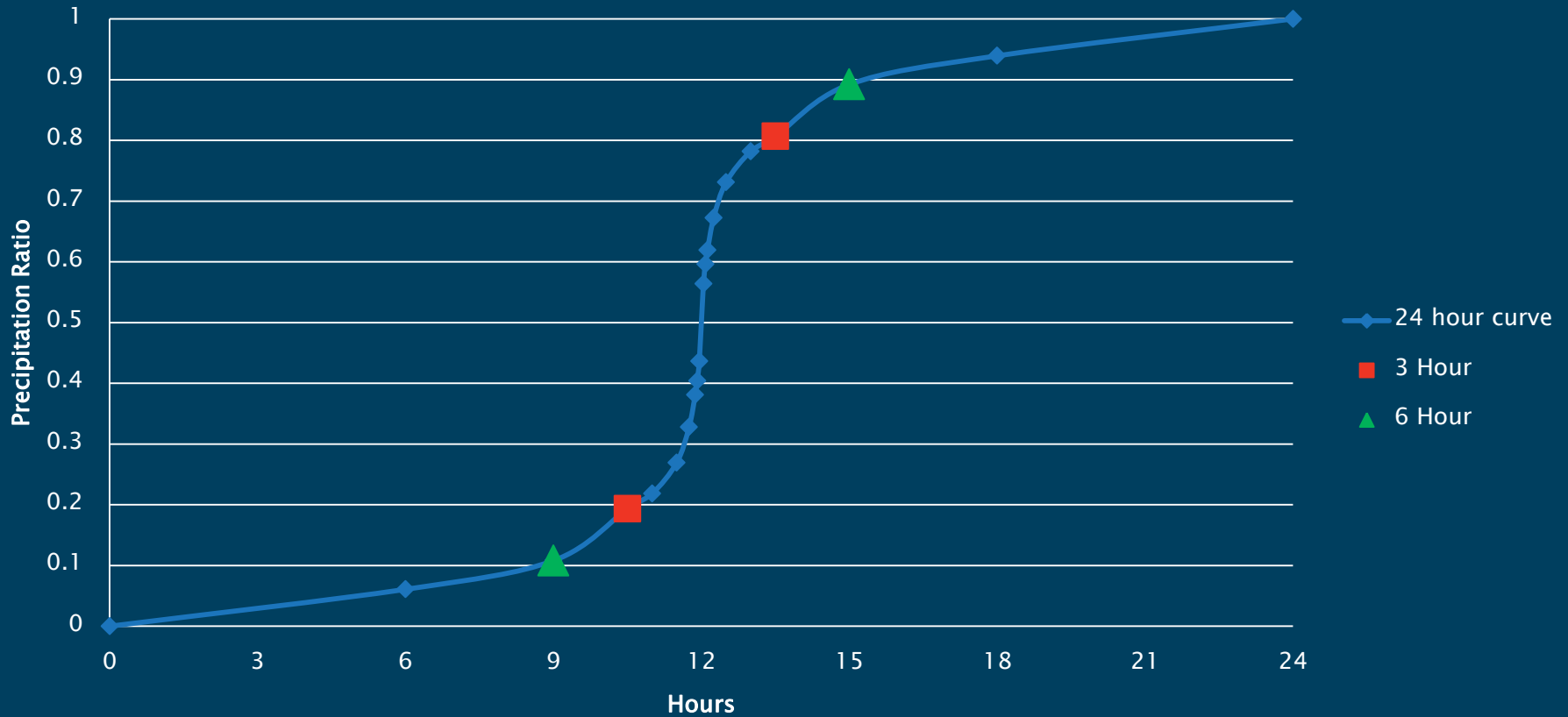
Example of a Nested Distribution

Atlas 14 24 hour– 100 year nested distribution



Example of a Nested Distribution

Atlas 14 24 hour– 100 year nested distribution



Atlas 14 vs. NRCS Distributions

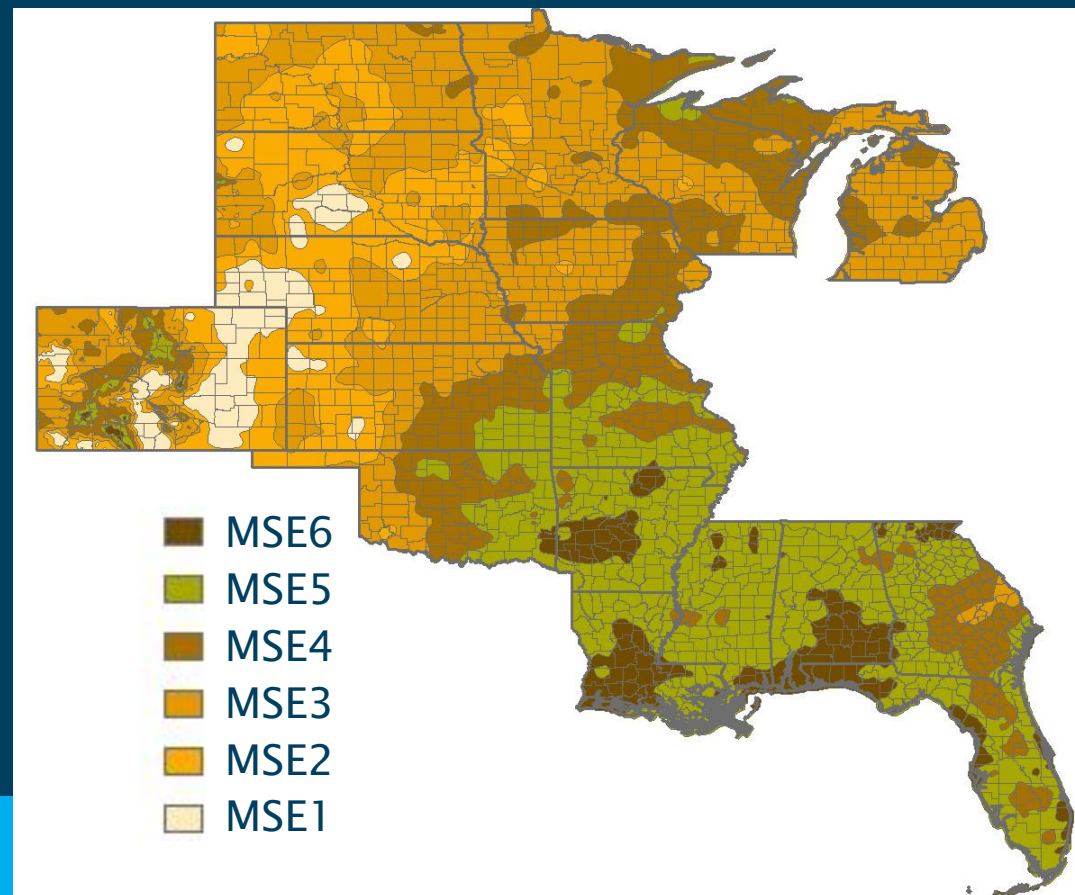
- ▶ Old NRCS Type II distribution developed in 1960's based on TP-40
- ▶ NRCS is adopting NOAA Atlas 14 in the states where it is applicable
- ▶ WinTR-20 has been updated to use Atlas 14 rainfall distribution
- ▶ NRCS has developed new rainfall distributions, Minnesota NRCS office recommends using MSE-3 distribution



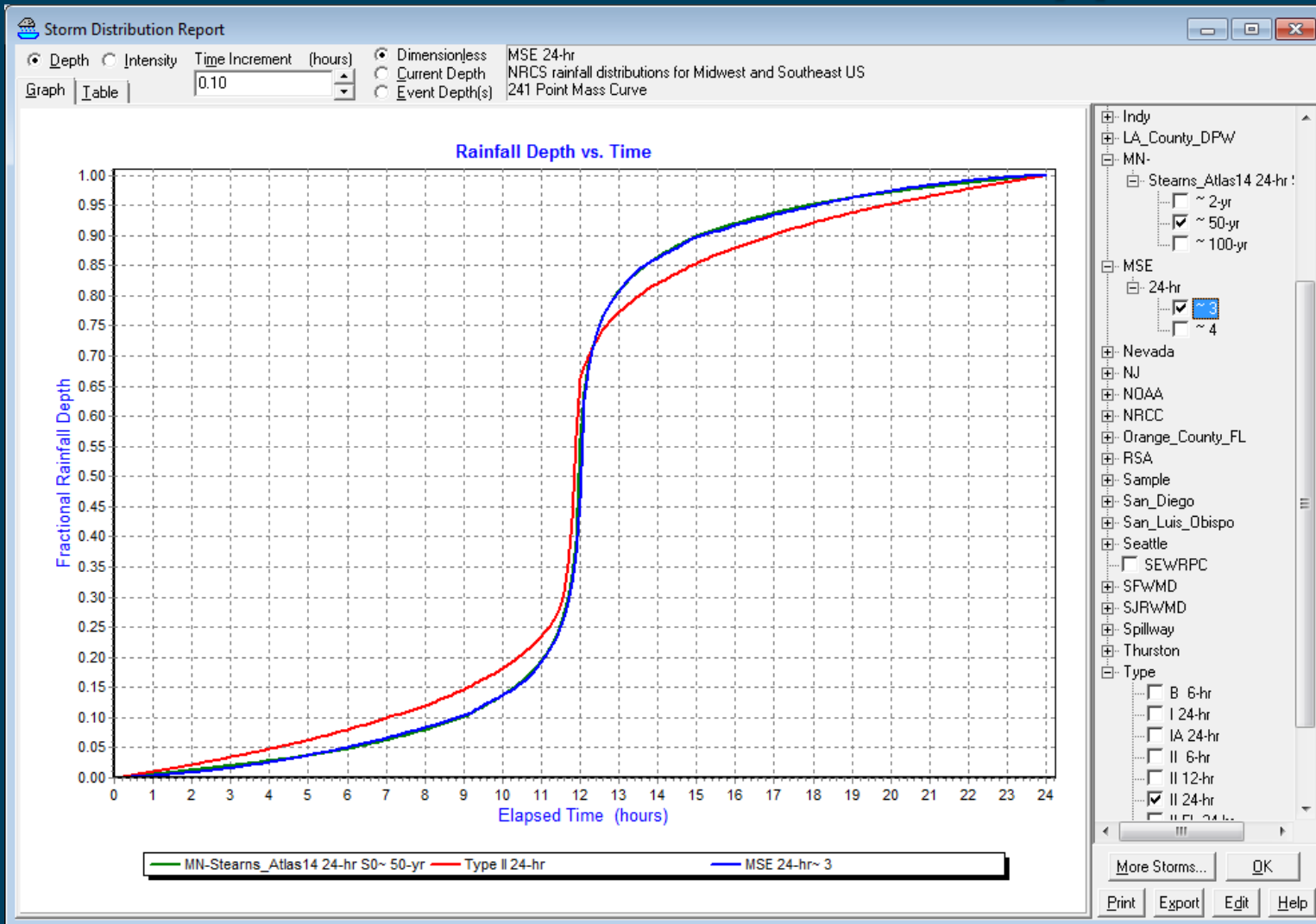
NRCS Temporal Storm Distribution

National NRCS developed typical storm distributions based on Atlas 14 data

Developed for
Midwest and
Southeast US
(Atlas 14 volumes
7 and 8)



Atlas 14 NRCS MSE-3 vs. Type II



Recommended Rainfall Distribution

- ▶ Recommend using Atlas 14 derived rainfall distribution or MSE-3 when using NRCS method
- ▶ See MnDOT Tech Memo [15-10-B-02](#)
- ▶ See Minnesota NRCS Web Site
http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mn/technical/?cid=nrcs142p2_023722



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

