Offline gstlal analysis
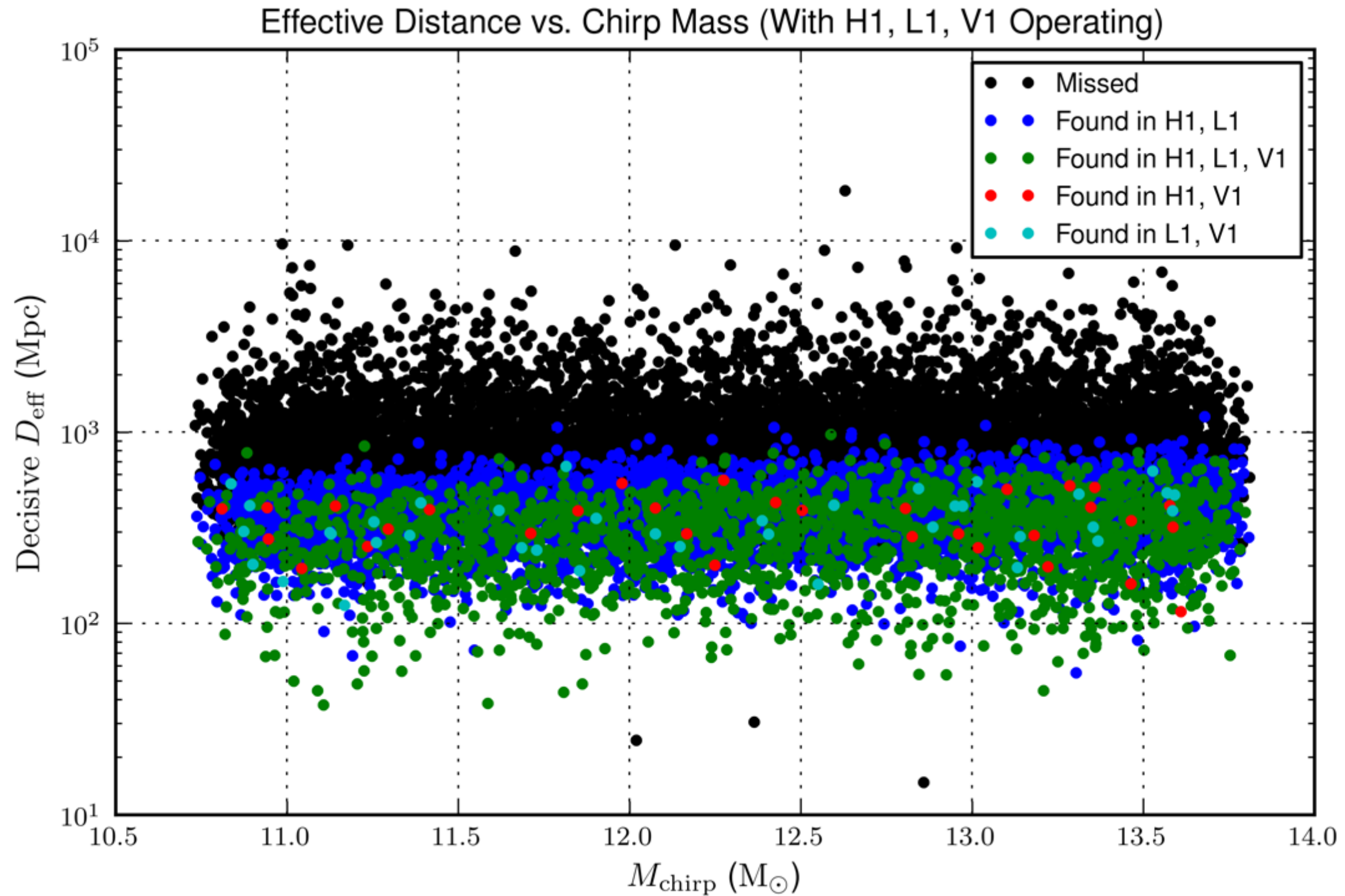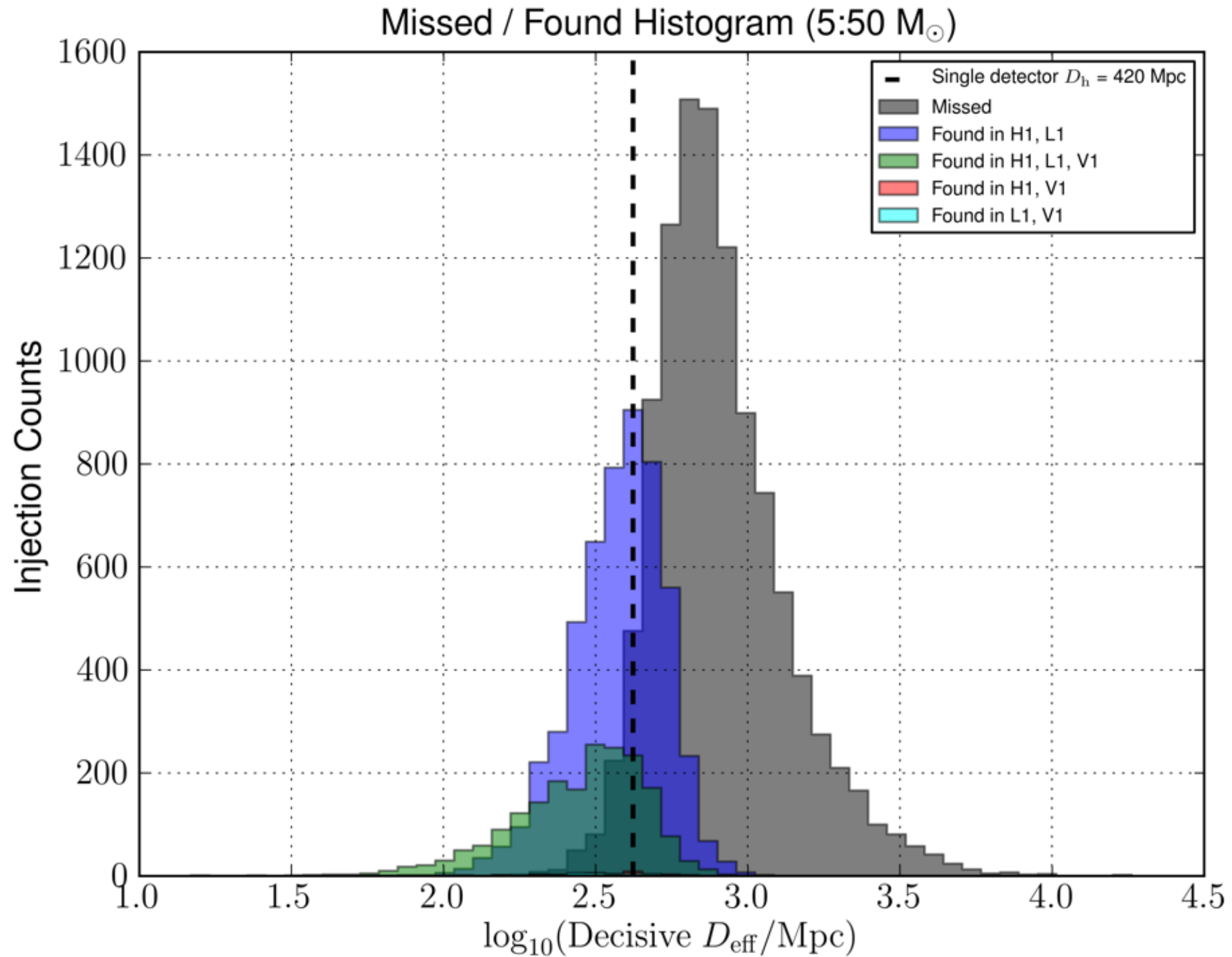
- Used the ER5 release of LAL and gstlal

- Template Bank:

  - EOBNRv2 (same as injections)

  - M_{tot} = [50,350] M_{sun}, $m_{1,2}$ = [3,200] M_{sun}, q = [1,14]

  - f_{low} = 25 Hz

  - Minimal match = 0.985
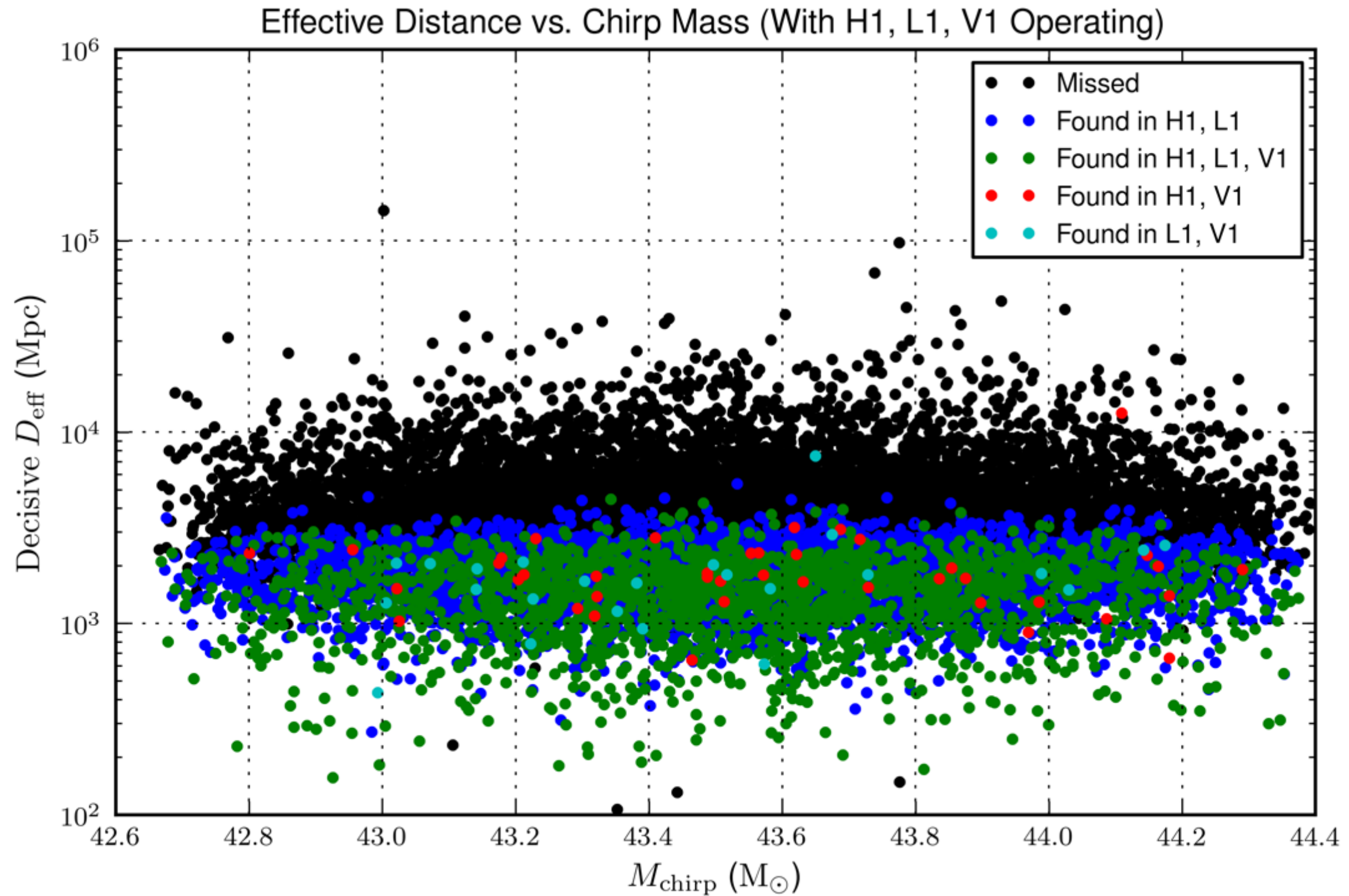
- Same template bank used for each injection set

Missed / Found Plots - 5:50

Effective Distance vs. Chirp Mass (With H1, L1, V1 Operating)

Legend:
- Missed (black)
- Found in H1, L1 (blue)
- Found in H1, L1, V1 (green)
- Found in H1, V1 (red)
- Found in L1, V1 (cyan)

Y-axis: Decisive D_{eff} (Mpc)

X-axis: M_{chirp} (M$_\odot$)

Missed / Found Plots - 5:50

Missed / Found Histogram (5:50 $M_\odot$)

Legend:
- Single detector D_{h} = 420 Mpc
- Missed
- Found in H1, L1
- Found in H1, L1, V1
- Found in H1, V1
- Found in L1, V1

Y-axis: Injection Counts

X-axis: $\log_{10}(\text{Decisive } D_{\mathrm{eff}}/\text{Mpc})$

Missed / Found Plots - 50:50

Effective Distance vs. Chirp Mass (With H1, L1, V1 Operating)

Missed / Found Plots - 50:50

Missed / Found Histogram (50:50 M$_\odot$)

Missed / Found Plots - 150:150

Effective Distance vs. Chirp Mass (With H1, L1, V1 Operating)
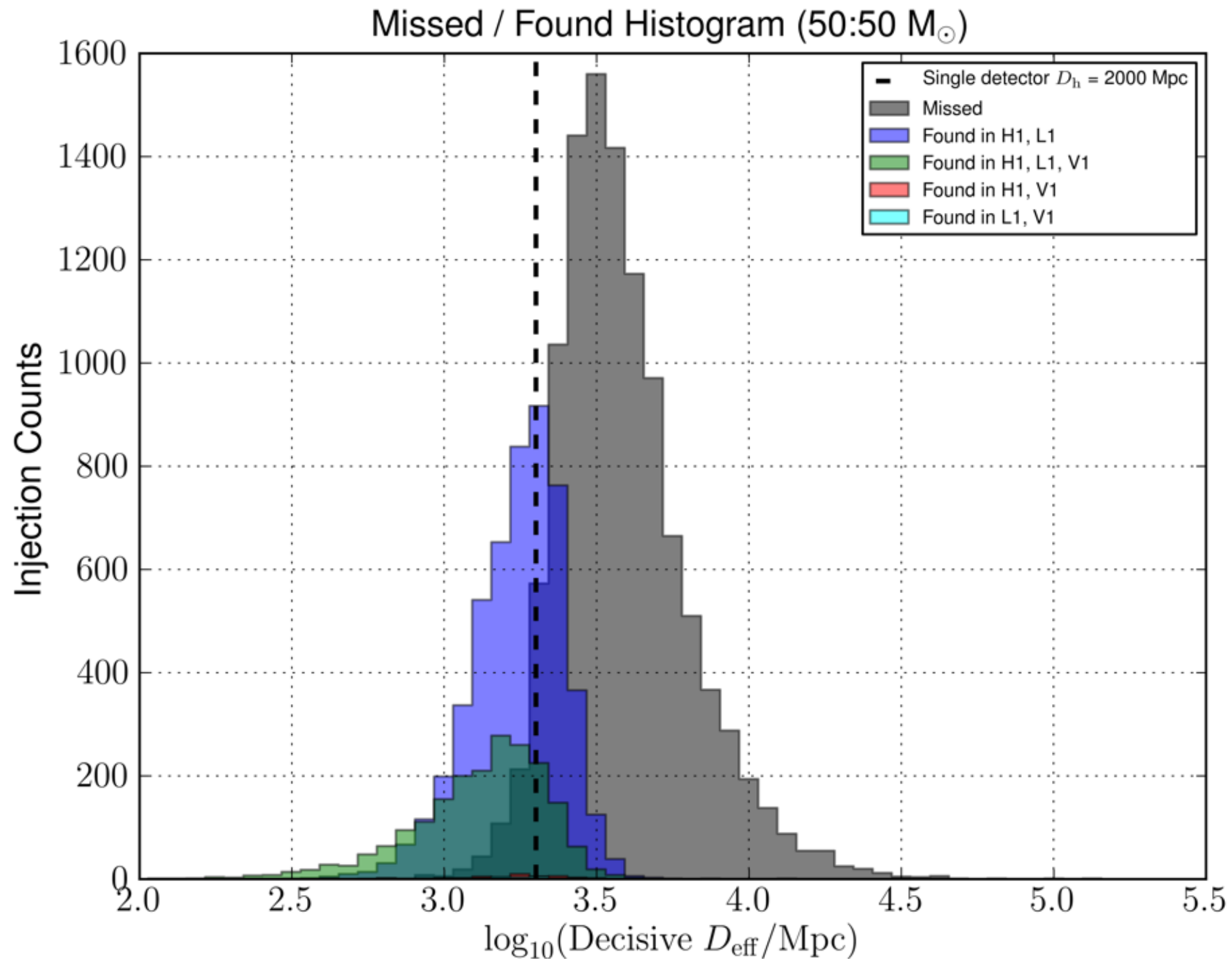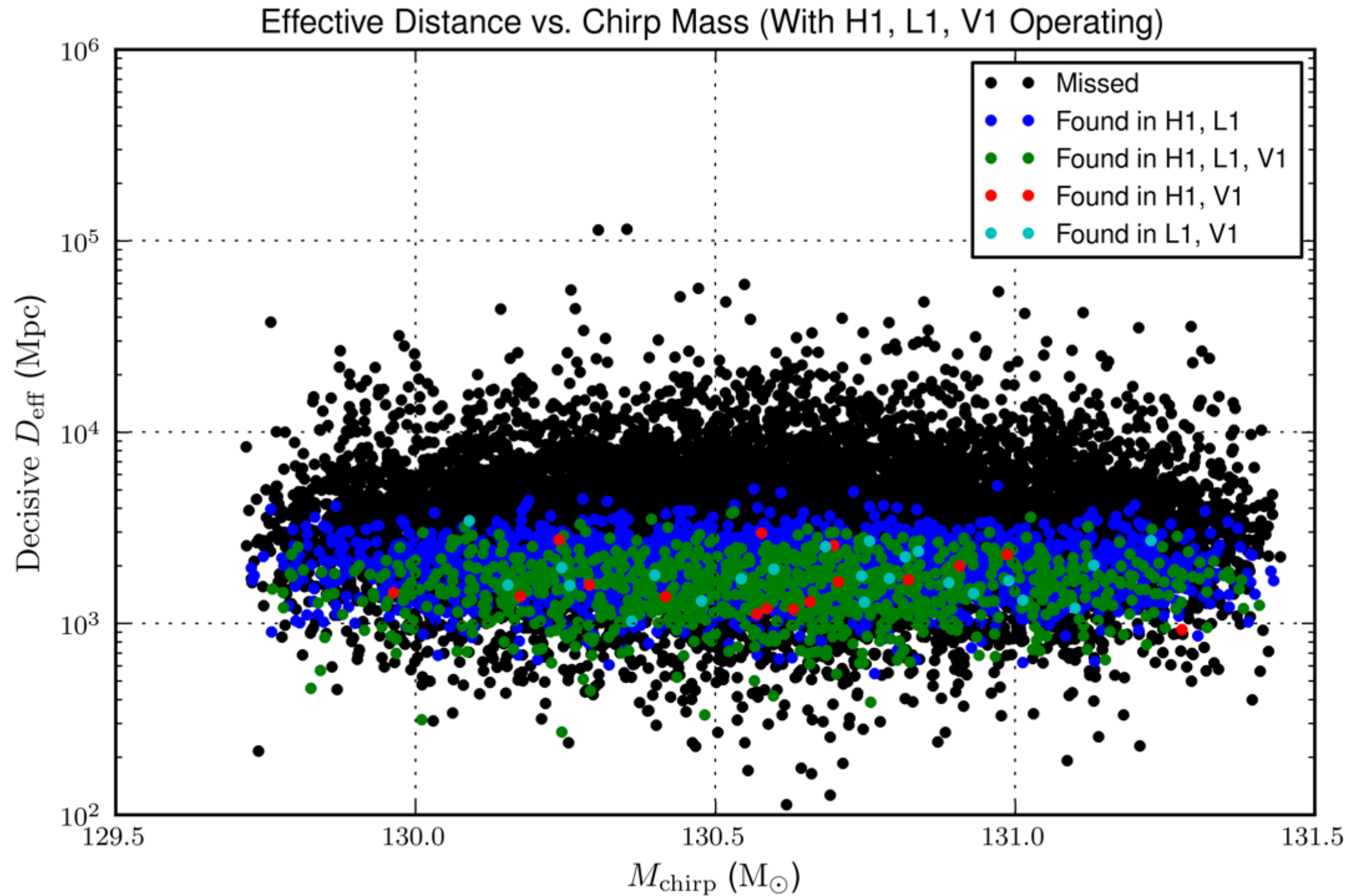
Missed / Found Plots - 150:150
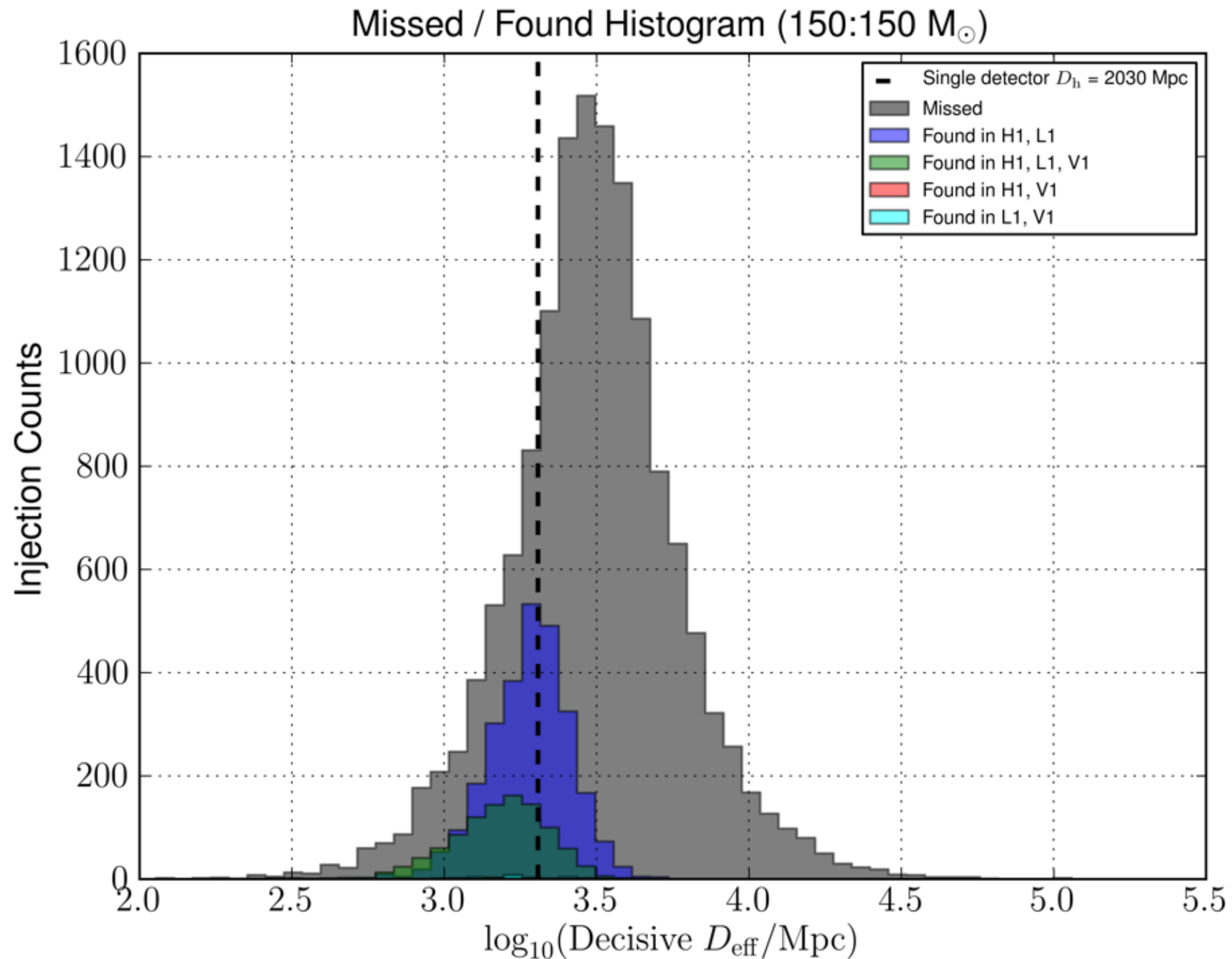
Missed / Found Plots - 150:150 (Recolored, 1 day)

Effective Distance vs. Chirp Mass (With H1, L1, V1 Operating)

Legend:
- Found in H1, L1 (blue)
- Found in H1, L1, V1 (green)
- Found in H1, V1 (red)
- Missed (black)

Axes: Decisive D_{eff} (Mpc) vs. M_{chirp} ($\mathrm{M}_\odot$)
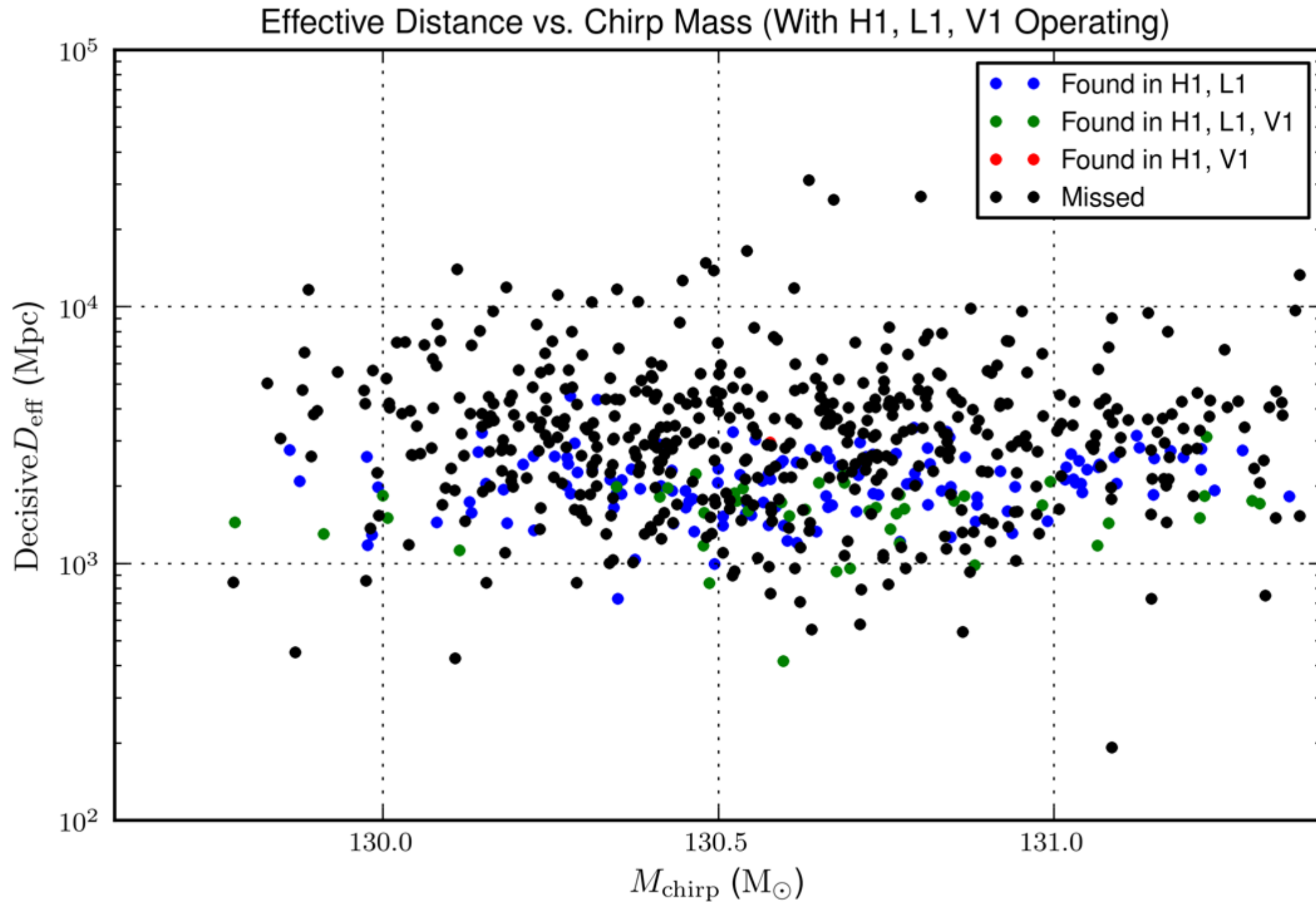
Missed / Found Plots - 150:150 (Gaussian, 1 day)

Effective Distance vs. Chirp Mass (With H1, L1, V1 Operating)
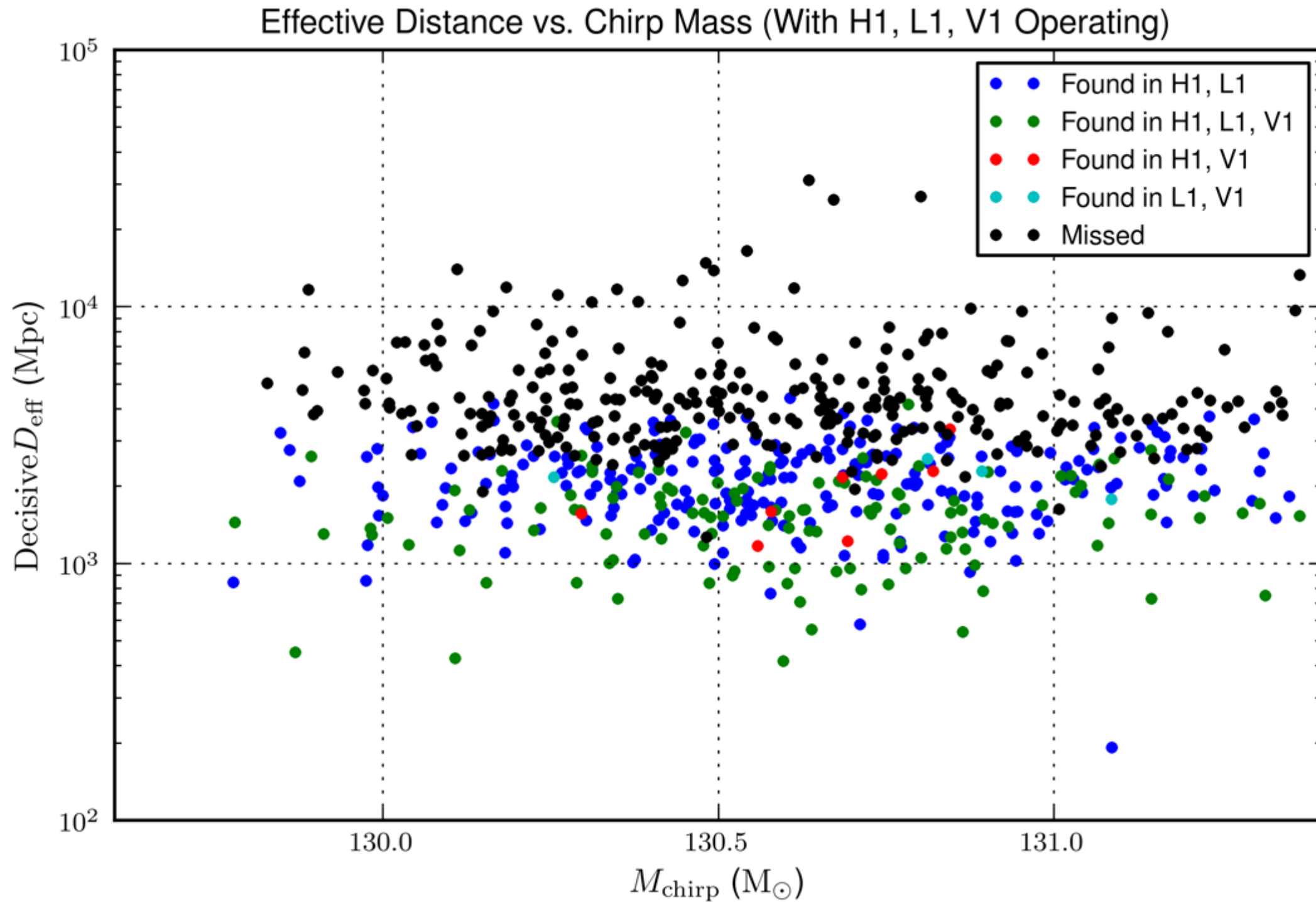
Future attempts to improve sensitivity

- Use more than one chirp mass bin for background estimation

- Tune the analytic foreground χ^2-SNR distribution to more accurately match distribution for high-mass signals

- Tune the smoothing kernel used to estimate the background χ^2-SNR distribution