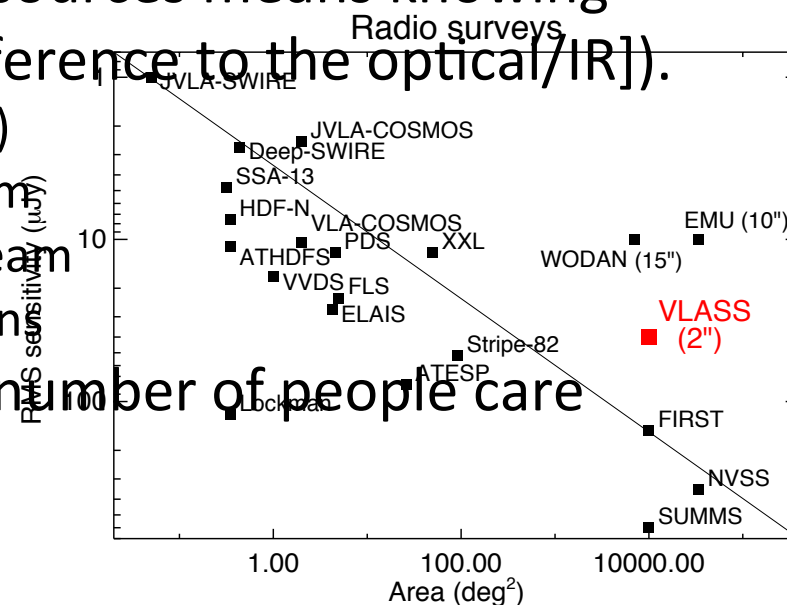


The S-Band Sky Survey (SBSS)

Any new VLA Sky Survey should be designed to maximize the legacy value of each pointing, we suggest that this means:

- Maximizing the number of sources. For a shallower than Euclidean distribution, that means **wide** rather than deep. FIRST area or larger and at least 3x deeper.
- Maximizing the resolution, while minimizing over-resolution. (Since maximizing the number of sources means knowing what source is what [e.g., with reference to the optical/IR]).
 - $N_{\text{gals}}/\text{sq. arcmin} = 46 * 10^{0.31 * (i-25)}$
 - >2 galaxies with $i < 24$ in ASKAP beam
 - 14 galaxies with $i < 26.8$ in ASKAP beam
 - Thus B-array (or A-array) observation
- Pointing in an area that the most number of people care about (e.g., LSST, DES fields).



The S-Band Sky Survey (SBSS)

Given these constraints, S-band provides the biggest impact:

- Broader bandwidth than L for radio colors and depth
- Less of the survey area limited by dynamic range (vs. L)
- Frequency/Resolution not too high/too low
- Legacy value into the ASKAP, MeerKAT and SKA-phase 1 era

Surveys are very efficient. Not just in “open-shutter time”, but also in community utility. A number of options exist for a “super-FIRST” taking less than 8000 hours (including overhead):

Table 1. FIRST-like S-band VLASS Survey Parameters

Area (deg ²)	Depth (μ Jy) [rms]	Time (hours)	Exposure (s)	Efficiency (%)
10000	15	37000	342	92
2200	15	8000	342	92
10000	50	3970	31	71
20000	50	7940	31	71
10000	35	7500	60	81