

Table S1 Parameters of the datasets included in this study.

| Subject ID | Site | Awake (movie) MION                                       | Awake (rest) MION                              | Awake (movie) BOLD (without MION)                   | Anesthesia MION   | Anesthesia BOLD (without MION)                                    |
|------------|------|--|--|---|---|---|
| NKI-R      | NKI  | 2 sessions (88 min)<br>mean FD = 0.127 (0.046)           | NA   | 3 sessions (96 min)<br>mean FD = 0.075 (0.023)      | 2 sessions (110 min)<br>mean FD = 0.017 (0.002)                   | NA  |
|            |      | subset 1: s1 (32min)<br>subset 2: s2 (56 min)            |  | subset 1: s2 (32min)<br>subset 2: s1, s3 (64 min)   | subset 1: s1 (50min)<br>subset 2: s2 (60 min)                     |   |
| NKI-W      | NKI  | 4 sessions (240 min)<br>mean FD = 0.119 (0.042)          | 1 sessions (80 min)<br>mean FD = 0.164 (0.044) | 3 sessions (180 min)<br>mean FD = 0.106 (0.037)     | 3 sessions (188 min)<br>mean FD = 0.021 (0.002)                   | NA  |
|            |      | subset 1: s1, s3 (120 min)<br>subset 2: s2, s4 (120 min) |  | subset 1: s1 (60 min)<br>subset 2: s1, s3 (120 min) | subset 1: s2 (48 min)<br>subset 2: s1, s3 (140 min)               |   |
| OHSU-1     | OHSU | NA   | NA   | NA  | 8 sessions (240 min)<br>mean FD = 0.024 (0.001)                   | 8 sessions (240 min)<br>mean FD = 0.023 (0.003)                   |
|            |      |  |  |   | subset 1: s2, 4, 5, 8 (120min)<br>subset 2: s1, 3, 6, 7 (120 min) | subset 1: s2, 4, 5, 8 (120min)<br>subset 2: s1, 3, 6, 7 (120 min) |
| OHSU-2     | OHSU | NA   | NA   | NA  | 8 sessions (240 min)<br>mean FD = 0.033 (0.007)                   | 8 sessions (240 min)<br>mean FD = 0.029 (0.006)                   |
|            |      |  |  |   | subset 1: s2, 4, 5, 8 (120min)<br>subset 2: s1, 3, 6, 7 (120 min) | subset 1: s2, 4, 5, 8 (120min)<br>subset 2: s1, 3, 6, 7 (120 min) |

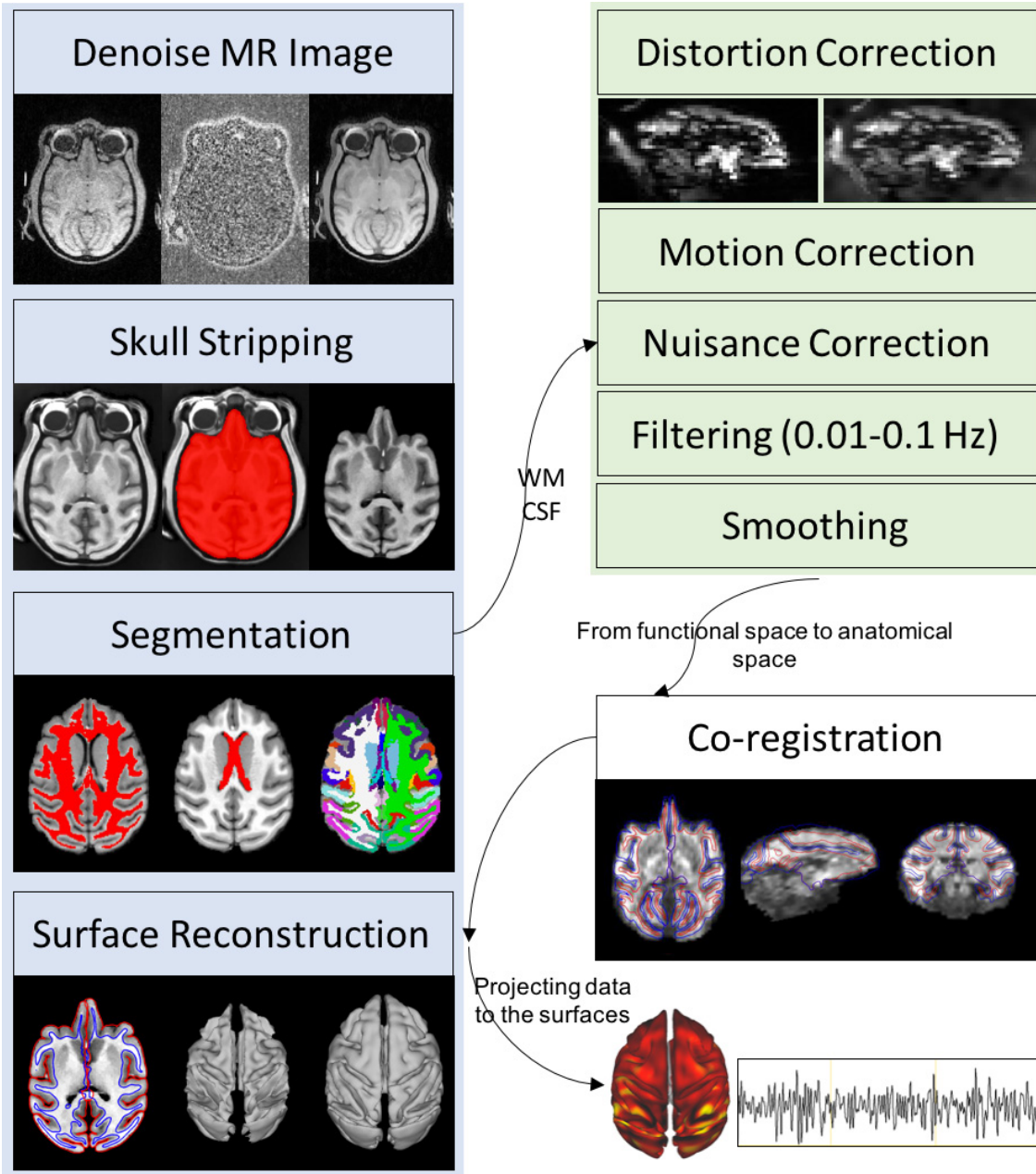


Figure S1. The workflow of the data-preprocessing

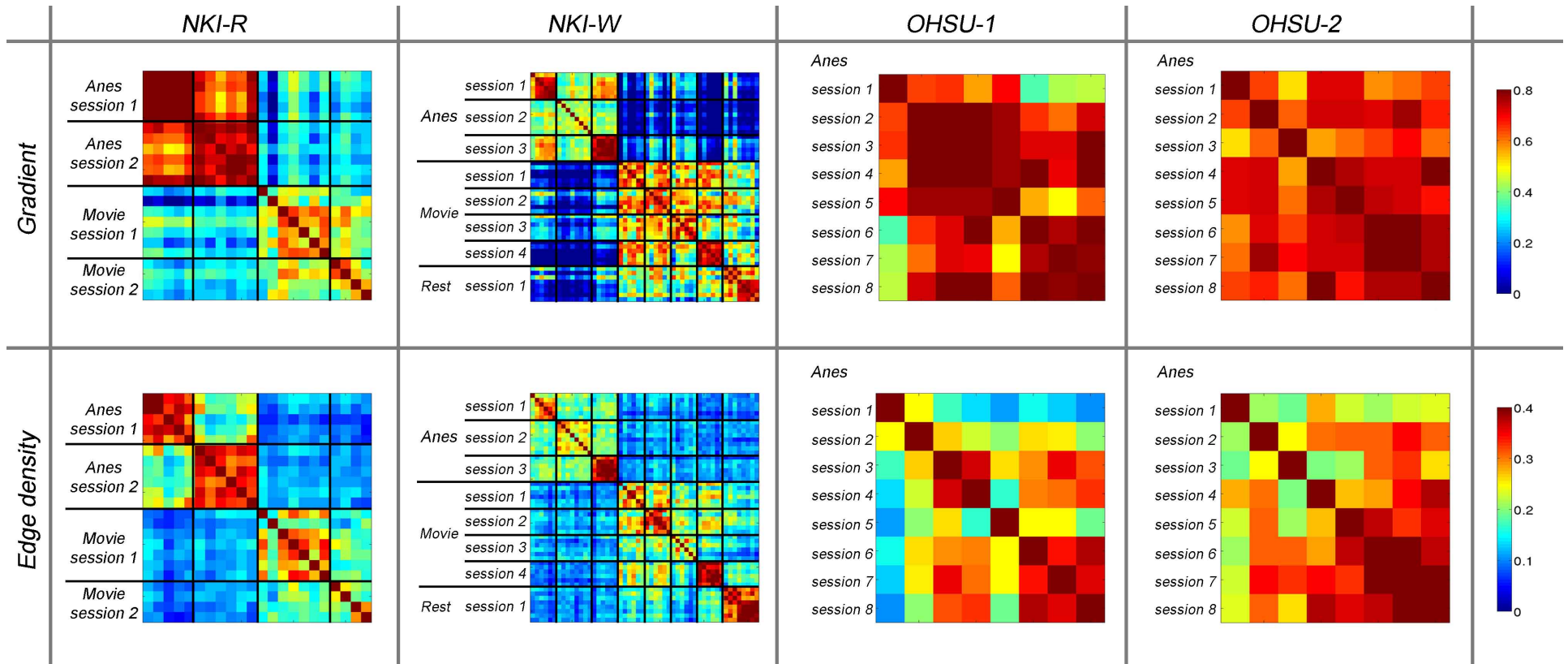


Figure S2. The spatial correlation matrixes of gradient and edge density maps between scans across four monkeys and sessions. NKI-dataset acquired 8-10 min per scan and 5-7 scans per sessions while OHSU-dataset acquired only one 30 min scan per session.

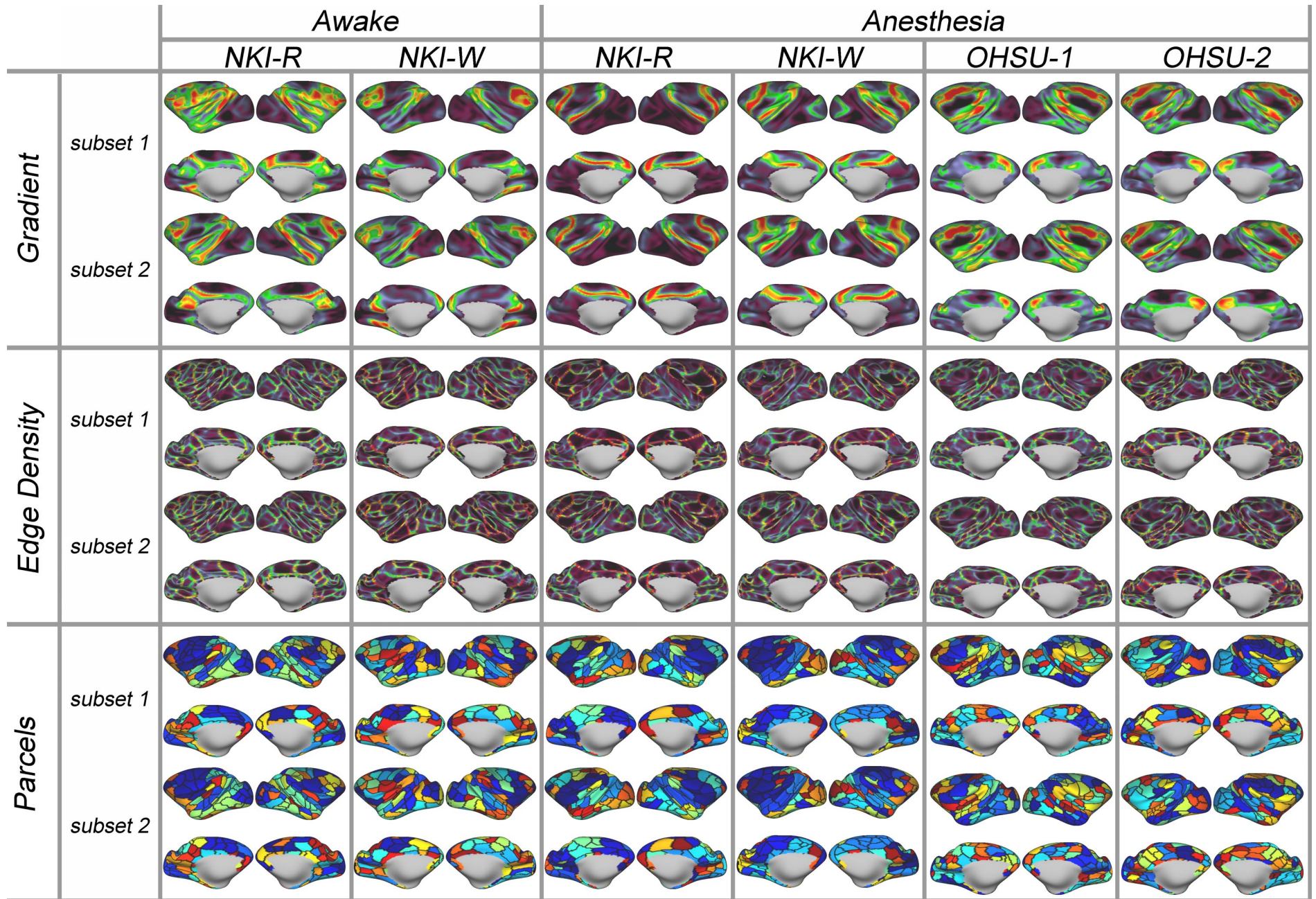


Figure S3. Subject-specific areal organization (gradient, edge density and parcellation) from two independent subsets under awake and anesthesia in four macaques.

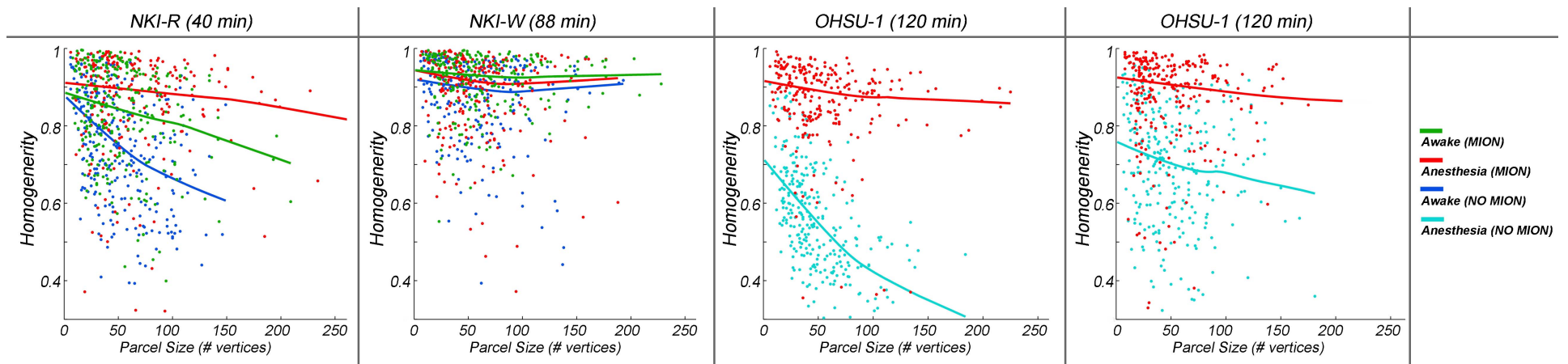


Figure S4. Homogeneity of subject-specific parcels by parcel size in different conditions (awake and anesthesia, MION vs. BOLD).

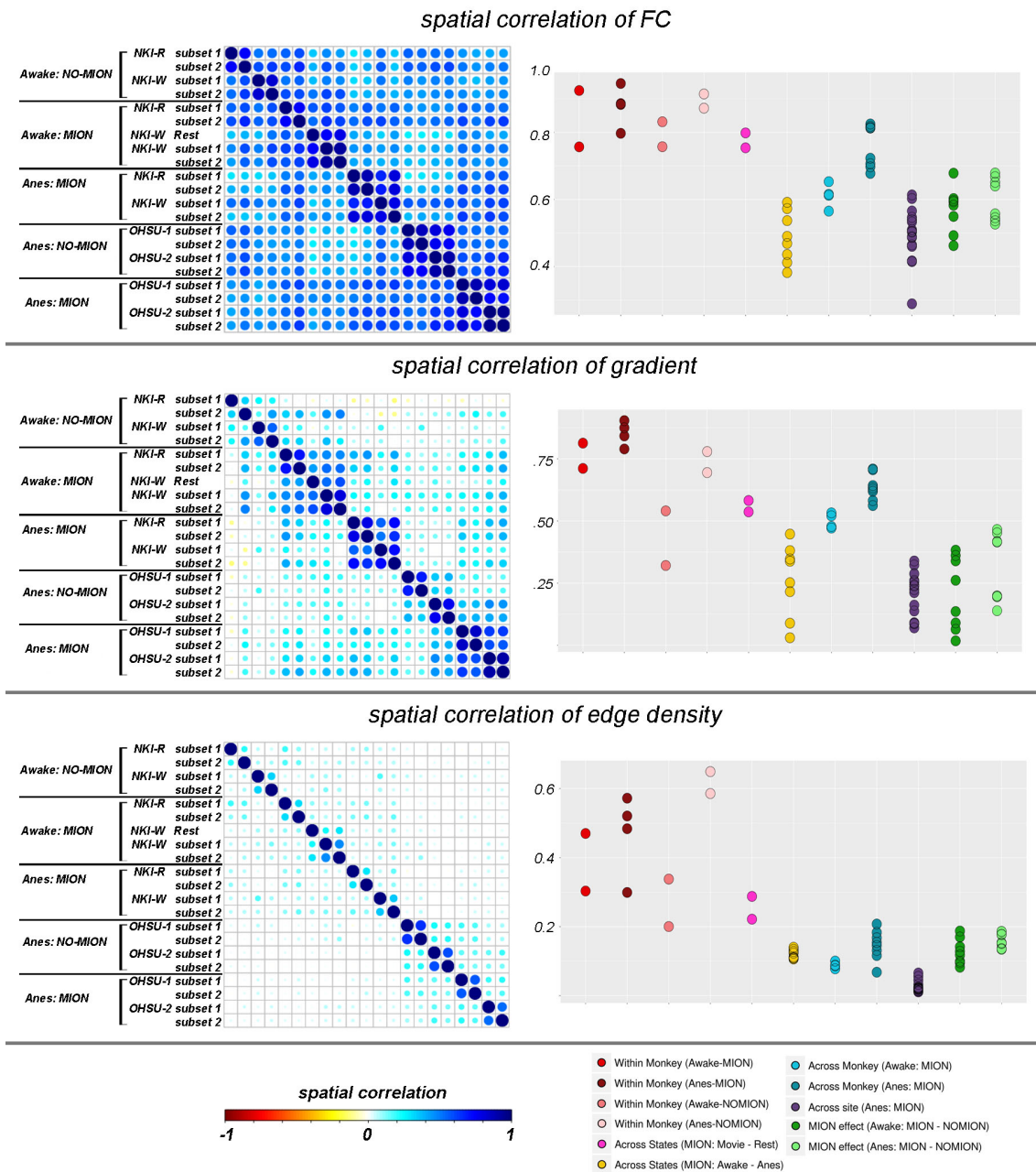


Figure S5. The spatial correlations of FC, gradient and edge density maps across four macaques and subsets under different states from two sites (left panel). The distribution of correlations within- and between-monkey, states, and sites (right panel).