

Appendix C: Percent Impervious Area Analysis Methods

We analyzed land use maps to evaluate the effects of development on watershed health by using percent developed area and percent impervious area. Land use data was obtained from the 2001 Southern California Association of Governments (SCAG) and aerial photographs for Los Angeles County (2002) and Ventura County (2003). We reclassified the SCAG data using the Anderson Classification system (Anderson et al. 1976) and created two additional land use categories: Parks and Cemeteries and Abandoned Agriculture. Abandoned Agriculture is generally placed into the Vacant Land use category, however our analysis of aerial photographs indicated that runoff from Abandoned Agriculture will act more like runoff from existing Agriculture than Vacant land. The Parks and Cemeteries category included the following SCAG land use categories: Cemeteries, Other Open Space and Recreation, Undeveloped Local Parks and Recreation, Developed Local Parks and Recreation, Developed Regional Parks and Recreation.

After reclassification, we calculated the amount of development upstream of monitoring sites. We calculated percent developed area as the amount of land that was not classified as Vacant or Open Space Recreation divided by the total amount of land upstream of a given site. Further, the SCAG land use data was evaluated to determine how much of a given land use category would result in runoff. Each land use category was assigned an impervious factor (IF), or a number representing what percentage of the land use results in runoff (Table C-1). The IFs were derived from the Los Angeles County Department of Public Works (2006) and Ackerman et al. (2003). Animal Husbandry has no specific documentation by Los Angeles County Department of Public Works (2006) or Ackerman et al. (2003). We assigned an impervious factor of 6% which is the same designation used by Ackerman et al. (2003) for Agriculture, Nurseries and Vineyards. The Golf Course and Under Construction land uses were also

considered to have 6% impervious cover, as they are more similar to irrigated agriculture than to unmanaged open space. The IF was multiplied by the acres of each specific land use, these values were totaled for all land-uses upstream of each site, and divided by the total amount of land to determine the percent impervious area that drains into each monitoring location. Calculation of percent impervious area removes those portions of developed land uses that are pervious but does not distinguish between those surfaces that are directly connected to the storm drain network versus those surfaces that drain into pervious areas. We recognize that this evaluation may not provide a complete picture of runoff in the watershed, as it does not account for proximity to the waterbody nor does it fully account for directly connected impervious areas versus unconnected impervious areas.

Table C-1. Impervious factors for land use categories in the Malibu Creek Watershed.

Land Use Category	Impervious Factor
Abandoned Agriculture	0.060
Agriculture	0.060
Animal Husbandry	0.060
Communication Facilities	0.750
Education	0.750
Floodways and Structures	0.000
General Office	0.850
Golf Courses	0.060
Heavy Industrial	0.800
High Density Single Family Residential	0.600
Institutional	0.750
Light Industrial	0.750
Low Density Single Family Residential	0.400
Maintenance Yards	0.750
Marina Facilities	0.750
Mixed Commercial and Industrial	0.800
Mixed Transportation and Utility	0.750
Mobile Homes and Trailer Parks	0.417
Multiple Family Residential	0.600
Natural Resource Extraction	0.750
Nurseries and Vineyards	0.060

Open Space Recreation	0.030
Other Commercial	0.850
Parks and Cemeteries	0.100
Receiving Waters	0.000
Retail Commercial	0.850
Rural Residential	0.350
Transportation	0.750
Under Construction	0.060
Utility Facilities	0.750
Vacant	0.019

References

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