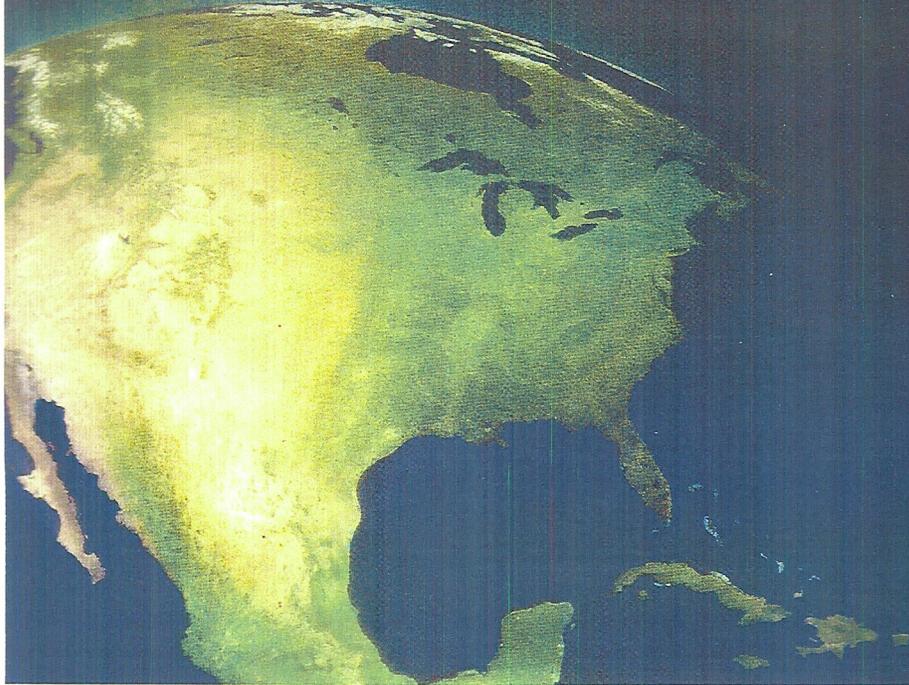


# CORS and OPUS for Engineers

Tools for Surveying and  
Mapping Applications



Edited by  
Tomás Soler, Ph.D.

**ASCE**

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**Review of *CORS and OPUS for Engineers. Tools for Surveying and Mapping Applications*, edited by T. Soler**

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This book (actually a monograph) is a collection of articles by a number of very well qualified authors describing various aspects associated with continuously operating reference stations (CORS) and online positioning user service (OPUS) applications, about half of which were previously published in ASCE's *Journal of Surveying Engineering*. The National Geodetic Survey (NGS), which operates the CORS network and provides the OPUS utility, has sponsored the monograph, and many of the authors are NGS staff. The monograph has been cosponsored by ASCE's Geomatics Division, which among its principal missions pursues the fostering and encouragement of the instruction and dissemination of geomatics technical issues.

The first two articles give an introduction to the CORS, including the history of the development of the National CORS, and present criteria for establishing and operating a CORS.

The next article describes in moderate detail the current flavors of OPUS—OPUS-S, OPUS-RS, and OPUS-DB—followed by a number of papers that go into more depth regarding the orbits used, accuracies attainable, and methods that can be applied to improve the accuracy of the solutions. The extended output from OPUS is described at length in an article by Peter Lazio, who, as a GPS manager in an engineering firm, has ample hands-on experience with CORS and OPUS applications.

One article is devoted to the basics of the teqc utility, employed by NGS and many other practitioners to convert raw data to RINEX and for QC checking. Two additional articles by Lazio describe methods that can be used to edit RINEX to improve poor solutions and problem data sets. Lazio also produced two other articles describing procedures by which the results of OPUS processing can be used in combined least squares adjustments.

Two articles by a large group of authors from The Ohio State University, NGS, and other academic institutions describe the software developed for the OPUS-RS processor and for ambiguity resolution over long lines.

The final articles in the monograph are by NGS's William Henning, describing the optimal methodology for determining precise RTK surveys; a contribution expanding on the horizontal time-dependent positioning (HTDP) utility; and two articles outlining methods to transform positions and velocities between reference frames and between epochs.

In the opinion of the reviewer, this monograph embodies a timely and opportune compendium, partially theoretical, but mainly composed of pragmatic step-by-step applications (e.g., how to combine OPUS results with modern surveying observations; how to understand error messages in OPUS-RS submissions) that may be very useful to frequent OPUS customers. The advantage of this collection of papers is that it gathers, in a single volume, the necessary didactic material to comprehend, in an intelligible manner, questions that may arise when using any of the different options available to surveying and mapping professionals submitting GPS data to the OPUS web portal.

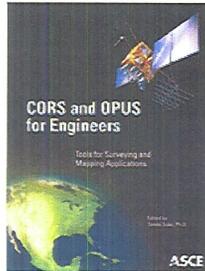
In summary, this monograph is one of the most useful reference tools for any surveyor or engineer involved in accurate positioning who regularly accesses the CORS and OPUS Internet utilities, and it will be considered an indispensable source of information that should be on every geospatial GPS data user's desk.



## CORS and OPUS for Engineers

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#### Description

Sponsored by the Geomatics Division of ASCE and the National Geodetic Survey of the U.S. National Oceanic and Atmospheric Administration.

*CORS and OPUS for Engineers* describes new global positioning system (GPS) technologies and procedures that are immediately relevant to civil engineering professionals engaged in high-accuracy positioning. This collection of 22 articles, half new and half previously published in peer-reviewed journals, assembles the latest thinking on the use of two advanced services-CORS and OPUS-for obtaining accurate positional coordinates. Created and managed under the auspices of the National Geodetic Survey, the CORS (continuously operating reference stations) network contains more than 1,600 permanent, geodetic-quality receivers that collect GPS data around the clock at locations distributed throughout the United States, its territories, and a few foreign countries. These data are then made freely available to the public via the Internet. OPUS (online positioning user service) is a free, automated, Web-based utility that provides its users with accurate and reliable positional coordinates in a timely fashion by processing each user's GPS data with corresponding data from the CORS network. Together, CORS and OPUS form the backbone of today's high-accuracy, three-dimensional positioning activities.

Both theoretical and empirical, this collection is a must-have for practitioners and researchers involved in surveying, GIS, remote sensing, and mapping applications that utilize GPS technology.

#### Reader Reviews

★★★★★  
By Anonymous

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