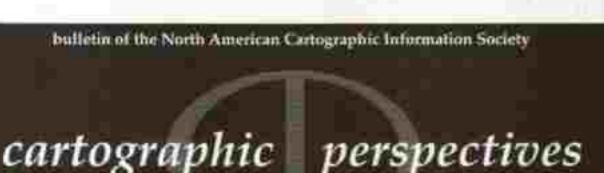
cartographic perspectives

North American Cartographic Information Society

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in this issue

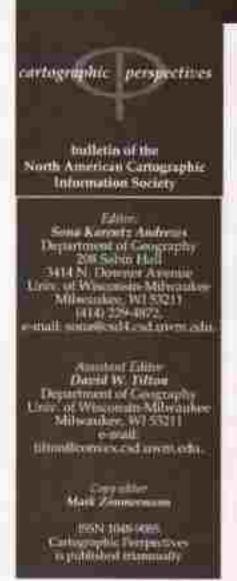
AHSSACES FEATURED ARTICLES Cartingtriphile mitrations potential and rewards touten Elyon Karl Viswitting uncertain information TO Alass Alt Mar Enchange BOOK REVIEWS Multman, A. 20. Gothy Wall May 1 prosents? for Norman Mark Magnine, D.L. M.F. Goodchild, and D.W. Rhind Inday. 21 Gregory liked internation systems principles and applications recorded by E. Lame Unerg. CARTOGRAPHIC PERSPECTIVES ON THE NEWS 25 LANDSAT Update RECENT PUBLICATIONS 23 ANNOUNCEMENTS CARTOGRAPHIC EVENTS NACES NEWS: 27 NACES XILEROGRAM AND CONFIDENCE SCHEDULE 931

MESSAGES.

MESSAGE FROM NACIE XII PROGRAM CHAIR

The Twelth Aroual Mosting of NACEs will be held October 14-17 to St. Paul, Microsotta. As always. the NACIS Conference will provide an open and protessional. annoupliere for the enchange of information and sless for all who -gustan bine square nii botevistoi ora capter. This year's programpromities to be quite inclining. Highlights include addresses by the dean of American cartingraphy, Arthur H. Roomson, and John France High, former produced of the Association of American Geographers:

The latest research developments in carrography, most rotatily in the areas of animated. mapping, cognitive arrangeaphy, cartegraphic education, and map libeariamship will be presented. Other sessions will explore mann! the enwittee in simple play and handware for ourtographic mediation, fediral mapping initiatives, and may library services and recens. In addition, this weer NACIS will be spemioring a senseof "bands on" workshops on unimation in cattegraphy and thereatic may design using the PC.



Several field trips are also planned to familiative consenues participants with the Twen Cities and their contests plants should have recently received to should have recently received to should never received information and a registration term for the spectars. We have also published a profinitionly conserved to be about the interest of CP. Do not be stated to receive and appealing on your have are questions on week to receive additional information and registration material.

Juffrey C. Putible Program Claim NACIS 301 -Department of Categorythe University of Faith Carolina -Greenbons Greenbons NC 27412

MESSAGE FROM THE EDITION

This issue marks some changes for Cortographic Perspections: Although the design and overall look of the publication remain the same (a): beat I hope it does when it goes to prouse there have been some significant changes. One of these is a change in officeality of the grammal. David Diffuse, who built served as editor of CP since its first living in March of 1989, completed his limite as edilize with some No. 12 (now known as the "white issue"). Tkmov I speak for every NACTS member in thursting Dave for making CP a soursal of highquality in both its continuand design. I personally approciate his amintarese in making the editorial transition or emouthly. Many of the contributions in this current lower were intituted, and in some cases strendy completed for me, to: Three and his stait of Penn State. I our only hope that we can comtimes to penduce a publication of equal quality.

Another wealth change marked by this issue is that instead of a single Formul Article, this seems has they continue detroine. It is my neger, and that of the Edinatial floand, that this precodest continnes and that the carrout ighic community benefit from the rechtesed scholarly contribution that CF can make. We wish to encourage extension of mantito sensit rodle the exclusive or stems of interest for publication consideration. Guidelines for papers and videologicum appear at the end of this impa

We will be publishing CP times times per year. We have ungeted a Fall, Winner, and Spring provides tion schedule. This issue Olumber 15, Fall 1992) has emportant information about NACIS XII. The meeting will be held in St. Paul, Minneson from October 14-17, NACIS members strong will have already received for shortly will movema a conference schemis.

program and regulation forms. however, we have also included this information on pages 31 - 33 of this ensure. You should note that NACES in conducting three yearleaboon this year. Machillash Animation, HIM Animation, and Map Production and Design These workshops will provide an excelhent opportunity to get hundson exponents to some of the new and exciting techniques that are champing the way we conserve. stone, and use maps. I urge arryone that can take advantage of these workshops to do us.

Finally, I would like to encourage each of you to let us know if you have suggestions for improving the quality and content of CP. Your input sell be greatly approxiated end not ignored. I look toriesed to serving as editor and hope that the information we provide through CP is interesting, informative, and beneficial.

Sone Revests Andrews

at proceeding

On June 7, in Chango, Illinos, Bartura Batte Productik died of cancer at the age of 52. Barbora was a member at NACIS and throughout her professional catter. Barbora jetegrated scheduly research inforests in the sydum of spatial knowledge, and maying participation in commercial carrographs.

Harbara was a Senter Sales
Representative for R.E. Doesnethey
Cattagraphic ferviors. Mapping
Services Division serve 1975. From
1970 to 1973 the seas Cattagraphic
Editoriol the Aller of Early American History, and lives 1984 to 1970
was Cartagraphic Editor and Statt
Consultant in Research and Design
for Ward Rook Engalopetic. She

preference on prope 23

featured articles

The potential of computer animation has been realized in many different disciplines. Animation is also a powerful visualization tool for cartography; however, it has been neglected until recently. This paper pottrays the need for animation in cartography in the light of the new approaches and methods in the sciences as well as in society. It discovers two main reasons for the lack of animation in cartography the fination on the printed map and the absence of a comprehensive approach in cartographic animation. Finally, a variety of issues for forther research are proposed.

C accept years, loop organized to computer herd site and account for the property of computer animalism possible. The property of computer animalism possible. The property of computer animalism possible the property of computer animalism by different disciplines, for example the film redustry, architecture, todaim design and the accepts.

Computer animation also has many potential uses in care graphy. It allows the creation of may sequences that can show spatial determining dynamically. Animated may sequence can depict time directly as a carriag agine cardolic, they can depict tithe matter may ped to different ways; and they can present the map objects in a particular sequence. But do so untily pend title east of ten greation display? Can according mally show more than the presentation forms we already have, at in animation only a toy for cartegoraphers? To account this, we need to examine the modern approved as and methods in the sciences as well as in society.

Spatial power has a honged from the analysis of static same in the study of process. Researchers are no longer interested in affairing only static situations; they are more executed with charges and regress that reduce or cause different states. Maps are an experient tool for spatial scientists. The static map has every, as not able to show processes directly. Of course consists where have developed different mathods for depicting changes but all of these resolvation rather the dynamic aspectives really to static states that our health show the charges that have place. Carringing its animal and considerable more by making the dynamic appears of spanish charges with the triangular over the making the dynamic appears of spanish charges with the triangular over. Processes become mine transported using animation for their constitutions.

figural science has also been influenced by system theory. Scientific investigations are no larger concerned only with isolated phenomena; they examine particularly the relationships and correlations of different phenomena. Selections need a representation from that can show all the correlations. Static proper are not the best presentation feels for diagram only these relationships. Other, purps are mentionally with influence may be show the many correlations. In an infiniated imap sequence may elementa can be presented in different embers and confining made the spatial relationships more apparent. The map user can be brought to the user's attention.

In the last twice, the science descrived a critical communities, it is specified that analysis to see patterns that allow across or quantitate or that possence and one special quantum. Scientific transferring requires computes authority in especially interactive animatics. It at case show that

Cartographic Animation: Potential and Research Issues

Doris Karl

THE NEED FOR ANIMATION IN CARTICIDATES

Destribet au stadent in the Providencestat derlie, Perferi htmp: Kerfapranka Armi-Halp-Sted II, 49-1088 Befor 41 data set to many different trees. The static map does not have this. flexibility in interesation display; it can show information only inconway, so it is raif a scitable immunion.

Thirdly, one should look at the map room of the ration — the children of today. This young common estates collect, the yoles greened in bound to support young. These children are not a separated to be computer than most adults the manuscript and dynamic aspects of computer games are a matter of example for them. At other offs the computers with interactive and dynamic programs are read as a distance decise to room the students interest. In this respect, contaguagees have to ask of the traitificant static map will be a good common action medium for these littles map requires an object, we should look for allocative frame. Among the map requires that can be controlled littles, overly are an allocative.

It seems that corresponds around no a more than a most by and should be a sewed as a powerful visualization tool for costography that transcends the permitted of the proposal map. In spice of this promitted, company authorited that been negligibled in correspond until accounty. Two main reasons for the absence of automorphism or carriagraphy with the absence of automorphism or carriagraphy with the absence of a the first and most important reasons in the following two spectrum, the account, resulting from the first, is the absence of a confidence and reasonable, approach to carriagraphic administration.

THE EMPHASIS ON THE TRADITIONAL PROYTED MAP-AN OBSTACLE TO CAETCH GRAPHIC ANIMATION The middlineal pended map is required by unthigraphers as an excellent form of presentation. It is considered to be a product that has attribude our perfection in a long evolutionary process. Many representational methods and techniques have been developed for appointable; and the man, maps which in ground, middle the creation of good maps. Also, the map user is accommoded to the printed map and presumably he wants to have a "real" map, a paper map. Thus, one can say that the traditional pointed map is a standard for both the mapmaker and the map user. New techniques and methods, such as the use of computers in carbography, as also excompand with and measured against the printed map and exchange a partupe expeculty true to Europe as fallower (fine, p.51), a Cerman corresponding expeculty true to Europe as fallower (fine, p.51), a Cerman corresponding there, makes

The respillation of improvement of Courted Europe States Such and Substitution in the courter of the courter of

This quote importance the extent of the floatness on the period map. As a result of this thinking, other and perhaps better information displays are overfloated and the standard may as our placed in question.

If one aske selve the traditional map is used so the element, many arguments are lated in an favor

— trustificinal mages are through to be more attractive time computer generated mages

— text, link and after eyerbols are though to be more "alter" on a traditional map and not an architecture synthesis as appearance.

It affects the eye and keeps the map may's affection.

All these arguments per based on the weithers imprecising of a map. The expense appearance is a very important colorion in its evaluation. The importance of beauty or a map can also be found in a common distinction of carriagraphy on the art and actions of map coalong. That, one the weithers, value of a map contains to be one of the most important.

criteria for judging the quality of a map? Maps are the curriers of information in the psychologic remainshalten and should than so, he evaluated in this light as well? So the question to set is a bother the traditional map is really the best presentative form.

The use of computers in corresponding affires once terms of intermation deptay. Planever, because we are still flusted on the real-timed map, we everlook this potential and use the computers greaternizedly in minic manual methods.

If one tooks more closely at the application of computers in certagniphy, one sees that they have been consistedly tested to abstract one and work intensive tasks. Outsigns ones tacking and driffling have been internal and interactive computer systems note tacking to map design process tanging of the Post-cript allow the direct transfer of maps between the display and the mappe setter. The main effects have been directed in making computer-crimical maps as good as the finding of maps.

The ficulties on the proceed map isothin companies care graphs can be further demonstrated with expant to the German ATKIS project Authorized Engageptic Cartegraphic Internation Systems that will contain the date of the topographic imaps of Germans in digital faces. The purpose of ATKIS in to make perceite the digital preshadam of impographic maps that aim be updated quickly aid tastly, and the group not special purpose maps or single topics. The purposition are generated topic ATKIS are the traditional paper maps. New terms of information display are not a goal of ATKIS. Harriegs, (1989, p.m.), one of the designers of ATKIS, states in this context.

"William (Autorial Transport of the Digital Report of the processor of the Autorial Report of the Processor of the Autorial Report of the

The Brottom on the traditional snap and an purpose in the premary indiplot medium is attempty present telling chromosphy. It we do not resecute this finallist, we may injure time littles of intollisation display and we may may make their potential.

As a mouth of the fixation on the printed map, sales forms of information display have been overlanded and too little remarch has been done in this area. This is true for carrographic minimum.

The potential of autination for corrography was octially described by Thirmer (1901) and by Commoditional Robinson (1988). Nevertheless, only a send prioring of week has been done in this field. In the TeXh, when computer annuation because available, individual caringraphers used inmatters productionarily to allow spatial changes over time. The efforts were focused on producing animated may acquirous for special issues like the growth or a city (Valsier 1970), soulds socidents (Moellering 1976), population. growth in urban regions (Rose 1974) and immunion or three dimensional. objects (Moethering 1987). Mour of the 1980s ware no further with in party graphic animation. Not would the end of the 7%Os was corresponded animation rediscovered when orthographers redized the paraptial of militarities for the depiction and exploration of spatial and extented relationships and pulliarria. Some authors again; all AE attentions to the potential of curiographic strimation (Campbell and Egbert 1990), and a few new aridination techniques were suggested for the analysis of spatio-suspond data (Mormotor: 1989) and 1960) and the shally of guas-confiltic processes (Diffuse at al. 1997b) he THE ABSENCE OF A COM-PREHENSIVE ASSESSMENT OF A COM-CARTCORAPTEC ANIMA-TION - ANOTHER DESTACES addition, a program for amounting champletic maps was created (MacCibous III 1989).

All these works amplicated the application of cartegraphic ammation.

Most of them inclinately also with the realization of an accurated may arignment for one special issue. Only the labor works pick up a more common and enterior among at the cartegraphic application of autmotion.

These are important contributions, but they are individual sublimes to the individual problems. A comprehensive and systematic approach to the see of an individual contributions. Therefore, these knowledge about design, perception and production of an individual sequences is not available. There are no principles that till corresponding been as individual design and they are expensively and efficiently it can be made only approachedly because be applied withly and efficiently it can be made only approachedly because too many design receiver of an individual to an expensive of an individual to an individual and an individual approach to it. This will require intensive measures in different area and require intensive measures in different area.

REQUIRED RESEARCH

Future research in outrigraphic minimizes has be deal work in sometic of questions. The following researched by equivined:

Definition of cartographic assimation

The absence of a systematic approach to cartoppy the amount of terminal particularly cycleto above as arrive at the question What is consequently another does not seen to be a consequence. One amount on the short only for map sequences that deput changes over the process that the left for map sequences without a time of event that the mature of make process that the mature of the complex map sequences consequently as a special an interior before particular and particular and particular and particular and the sequences consequently of amount of the characteristics of amount on and have carried to defined. This should be the first question to be examined.

Cartographic applications

Most of the work in corrugacitic animatical has been floor in this area. However, the name has not been suitabled in its entirety. Further work inside investigate which office or most forms of animatics are possible and whether they are usuall. For this we have to examine different map types and their possibilities for correspondic amountains. Perhaps we will find your fatter of animated maps. A great deal of experimentation must be done within this your.

Graphic design of animated maps

As instead only sequences are different from the page are orderedly use. They are prodominantly implayed one CRT are not easily but dynamic, and are often about very packly. We must examine how such reapersual by designed. Some research on the design of notice on the computer display about your area and a loss in the reason of the large above beautiful to out of products and the inscription. The configuration is Most reconnected the dynamic aspect of may acquire as when we symbolic single may be complete map acquired on what is a product of the product of the configuration is an acquired that the final of the configuration is an acquired way. And finally there is the aspect of may completely, be an animalised may suppose the new

will see a single map fee endy a short time, so the map cannot be too complex. But have complex and the map by These issues must be tooler.

Legend design

Animals, map requires are different than staffs maps, therefore, the legions, the coplanation of a map, should be different to an animals of map. They make a compact? Multimoda offer me powerity to combine animalism with sound. Therefore, the lagrest can be an audio explanation appropriate for the complete makestanting of the animalism, or must is be completed by a similar legions? If we need a graph and legions, we have to think about the modific. Sorrey, is would have to be a dynamic legions! becomes, it also must be readable for the user.

Speed of animalast sequences

We know that in computes addition 20-25 packings per second are required for the perception of a commission prevention or change. But we do not know how that an additioned sequence countril for the depiction of relationalitys around by, so that the user our recognize the objects and intational pool the map sequence. This is a problem expectably for amounting on video because the sequences cannot be controlled by the user and the separal cannot by changed.

Creation and costerol of an animated map supporter

Carriographic immerious will become a tridespreed a maritarium tent only if the countries of a monated may expressed in our too-difficult. A very interfece that allows the teer to produce animations unity has to be discrete. For this, useful corresponding mentalism to be defined and at changing the same point of intering me effect must be defined und at the periodic animation sequences. Takes for this large been acquested by Maries per Chant. A second and very important point is the observable of an animation. If animation is to be more than just a man. If thus for the periodic first of interaction is to be more than just a man. If the object of the periodic first of interaction. Assume the sequence and to change the opening of controlling functions. We have so think atoms for the ways of controlling functions. We have so think atoms the ways of controlling functions. We have so think atoms the

Animation techniques

We also need more knowledge of the different animation techniques and not what types of an attorney work test. Our experience is the area well-minut because only a line companying animations have been realized. Generally 1990 has a uppered the large and describes one animation metaphine and factors are animation.

Carring aphic amount in requires a variety of resourch on design, creation, and use of automated map sequences, flictures of the posteroid of microsion for cartegosphy, more amount to resourch a required in the field.

The printing of computer animation for already been scallend by different disciplines. It can also be used for corresponding as a presented visual-business used that transcends the potential of the printing map. With animation, discipliness and research depth superings can be counted that share changes over time or can be used lookepid or explore quittal and attitude cat relationships.

CONCILIBION

New approaches and methods in spitted connect such as the strong templacies in a cumulating processes and correlations and the install specialistic equalities are reported as an expensive and some expensive and some expensive and some expensive and the printed map. Also, the map users of the number, the students of today, who are more expensive to increase the computers, so all probability and the many disciplination of information display.

In upite of the need for computer unimarine in cartography. If has been region to Justice recently. There are true many researches for this. The first is the frontier on the traditional printed may that is strongly present within surfagraphy. As a result of this thinking, other and perhaps better forms of indigenation display such as computer animalism have been overheaded. The second reason is the absence of a comprehensive approach to carter. graphic antenation. Because of the Gration on the Huddhard map for little research has been directed contrate gitter minutes in. Only some research has deale with the application of distriction to cartegraphy, and many essential somes have not been currented. Therefore, basic lowestedge about design, posseption and contium of assistant disp sequences is put available. If the polemial his animum in corresponds to to be tooland, we reed a comprehensive and epitematic approach to cartegraphic trimation. This will require premise covered brooking on the Arthritism. application, dyings, excited and control of animated map supprises as teeff or on ammetical techniques and their uses.

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El précessal de animación por computablique la sala describación en machadisciplinas aliferentes. La animación en morbida, hasta base por estasistializada o poderes a para la antegrafía, en embarga, basta base por estala alidivánscondada, finte arrigidir describe la necessidad de la animación en la consignada malede las mercas calos per y mendentada pala animación en la en la accidada. Se discriben dos rezones principales que caman la falla de anima, desce la corta grafía da las comercimientes apresana la consecución en enfolga compromisiyo hacia la animación carriagidada. Finalmente se proposura a seculad de tempo poro mas arvesticación.

DESCRIPTION

Visualizing Uncertain Information

Alan M. MacEachren

Alor M. MacLachers are
Processor in the Department of
Companies 202 Mathe Holling, The
Processor in State University,
University Park, PA Table
2-mail AVERIFSLIVALESULEDII

When a GIS to used to compile, analyze, and display information: the chance for immusphable or cornelle data modity is high due to the marging of multiple data layers. When a GIS is used to drive stap-based visualization, exploration of potential relationships lakes precedence over presentation of facts. In these early stages of scientific analysis or policy formulation, pore iding a way for analysis to assess uncertainty in the data they are expliciting is critical to the perspectives they form and the approaches they decide to pursue. As a basis from which to descelop methods for visualizing ancertain information, this paper addresses the difference between data quality and uncertainty, the application of Bertin's gasphic variables to the representation of uncertainty, encorposal models of spatial amortiality as they relate to kinds of cartographic symbolization, and extension of over interfaces united to presenting data and uncertainty about that data. Also touched on is the issue of interior we might evaluate our attempts to depict uncertain information on maps.

Limited to a critical beautiful to the competitive possible and the bendency of miner possible to troit both maps and computers as a medical less tablets than the homeon to be order decisions bound on them. When a KHS is most to compile, artifly as and display information, the chance the timerreptable in a matrix data quality is look due to the merging of multiple data layers. Together a life these data quality to men the flexibility of data managealation that makes CdS as provetted can be in a smaller policy be provented in the proper addresses a tracity of consumptial research inches the proper addresses a tracity of consumptial research the provented of a implication made that allow a study on to take this macronomy into account in these commits and policy formulation active too.

There is a sening matrice in consumption of attention to data quality. Only malpointary stage, bosenery, here been made there for to dust with the complex assess of visconney, data quality for posted measured data diagnose ment in his topic to evaluate and year and GIS applications. The importance of this topic to evaluate the decrease of the National Corner for Green profits in the medication and Analysis (NCGIA) to make viscolization of that quality the decrease materials in the feature of their posters.

Keep Bearts and Burtleria Builtered old (1997), proceeding the NCCHA position, reduces that quality of spatial macrowine. Substant in excursely, evilor, consistency, and reliability. These aspects of quality are meant to apply to more man becomend verify. It is seefed to be pre-consideration of quality insign with the framework of the Proposed Digital Cartingstiple. Data Standard (Machinery, et al., 1989), incorporating focusional accu-

The state process of the control of

racy, intribute accuracy, lagued consistency (i.e., a data structure where topology makes some), completeness interpretentive data and systematic ways of dealing with moving values and family feature.

The above quality enterprise are important, but to use a GIS effectively for eather a sentime requiry or policy to remain on, the scope must be brootlened. In this association depth the term invertainty has gained a me acceptance and I reggest that no night be better of if we follow their lead (Mergin and Henrium, 1990; Regels and Remissionals; 1990). Analysis occur from the proose amount of order in any particular data object—otherwise the social consecution of particular data object—otherwise the evaluable characteristics of particular data object—otherwise data, the term uncertaint of particular data object. Figure this perspective along, the term uncertainty in light be a living description of what the NCAIA (and many past cartographers) have been calling quality to satisfies, however, uncertainty includes seprething of importance beyond the narrow definition of quality that the NCAIA initiative section to be discussed to said. A little example will illimitate the fittermore between a focus on apositive and on uncertainty and why it is the latter that should guide our efforts.

limagine a single centus black in a city. You have sent an enumerator. cut to take the comme. In this purposite time, the response rate is 90%. In data quality terror, we might say that our population and moone informetion for this block is of less than perfect quality because of the lack of "completeness" in the data. Firther, there may be "attribute innocuracy" in the data collected due to enterphystanding of the survey questions or deliberate minimocranium abour itemo andrus lacous or education, or "applied macroscapes" of or or addition coulding growth by the comme growth as toc. If, in the adjacent comes block we somehow achieved, 100% participation in the present, every me and exhaud the question and give textfold. responses, and the counsentry made on medakes, a July midde assessseems would label that timit's data as period. What we will be leaving and of this american is the imag of variability cover both space and time and without stategories). This latter point is made upon forcefully by Langland. stall Univisit (1941) who arigine that, for the prapping of most socio-earremit phenomena, a champleth map of aggregated data for encountation. points in "a poor chance" due le settione writhin-unit carriebilité fluit settle tale privet than the evapone.

In addition to variability that to equital aggregation, attribute aggregation adds additional contability, and theretices, outcortainty. All data are
integrated. Even when indicatual measurements are intalized in the
data one, categories will be impossibly data and by the mathematical
proclaim of bully ideal attentional principle, impossibles which
we measured to the remote degree. Most data at a City, innerver, will be
grouped into most binader cotogories (e.g., will classifications, income
trackets, whether a boose has inform purplying or not one. I final at these
cases. The attegritist binader interactions unconstant even when the data are of
logic quality.

We can easily be correct that a particular location — a particular slate of sect. — the comes been sentent the aminute bounds of the corresponds and the spartial bounds of the enumeration unit to which it is aggregated. The appropriate tests for our comes blocks diagrams the containing as must move constitute blocks. Our level of uncertainty about map locations will be a function not only of the quality of values (as defined above), but of cartains around the mass values or expandit use to expense if the unit, and of spanish variability across the unit.

by adultion to sparral and attribiote data quality and variability, a final importantly to be don't with it temporal. The data, even if accoming and

We can only be certain that a particular footion — a particular footion — a particular data object — fits some where within the attribute bounds of the entropy and the spatial bounds of the enumeration unit in object.



Figure 1. Complete Properties which the second properties with the second properties of the seco

about their verseity will increase the to incentionly about semperal information, resolution with which that imposed adormation is specified, and the difference in time between data collection and data one. The proposed ambient manufactury will very with the kind of phononers. being represented.

When we are a fals, the important rates is the quarty of the decision.

homogeneous, represent a stapping at our point in time. Our amouttainty

When we are a fals, the important some in the quarty of the decisions we make — about a research course to inflave, an other development policy to propose, or an environmental equilibrium to entries. When he we use the term state quality or state uncertainty markets less than a before the total we give the SP uses to adopt the Security policy particular piece of information extracted to unit by database.

We can have highly accurate data while sail barring services data. The Lock of preclation is at heat as expectant an issue as a lock of accurate. Processor have refers, our easy to the speciality of data values in terms of agoids and digits, has be a more general week in 'the dagges of active resident with a lock of persons to the resident with the person of the dagges of active resident with a person of the dagges of active resident and the resident active and the resident active active persons. Additionally, with a phonomerous is represented the resident active as an active active

SEPRESENTATION ALTOURS

As has been period out does large, the term constitution has a number of definitions (Machachuer and Gausse, 1990). Machachuer, et. al., 1993). Here is will be considered a termina ability to directly model traged rotten of relationships that have no vertice term) together with the termit to de that are terminally augment the ability. Seatmental constitution today after our vertical and cognition processes to attend an invariable focus on the patterns departed rother than on moutably according these patterns.

Following from the above a company of via altertion a vesserals agencia to subtress via admining amountain information of subtress of subtress via admining amountain information of subtress and according and temporal uncertainty and the implications of this understanding for decision withing and for symbolizing and congruency according to their most familiary and for symbolizing and congruency according to their most familiary different analysis on he disaded into the components that magnetic require different analysis of materials a via administration of an action of the materials of previous familiary and according to the particle of the control of the particle of the control of the particle of the control of the particle of the particle of the control of the particle o

Varied goals and mests - categories of interaction with data

If we continue to attack corresponding processes with our community of model unions are seen will fail to take administrate of the process that CIS and the contents on tools provide. The words tool the fire approach data-quality is building thin to I might provide a thrill on an discontinuity for the optimal process contents map. It is content to recognize that CIS must a building tools attached to the provide the arrange of profitment place that easy books attached to the process of profitment place.

quality mech specifically. Daylet Chilling (1900) recently developed a graphic model of the major of usins he which purphics tright be put or scientific research (fig. 2). I believe that his basic model is mission, not only machine but so applied apartial decision tracking with a Cab.

As we begin to consider the viewhration of uncertainty, we need to be cognition to this paramof visualization guals and entransments and the corytic resonation requirements it implies. The kind of uncertainty and the tools away to visioniles it are leastly to your normal this course, from the over in U.S. by an EPA scientist exploring the spatial distribution of a policyand let the sweet Gib down map displays by palace makers frying to decide which ordunties to add in the but of those segulated not more worder consumers.

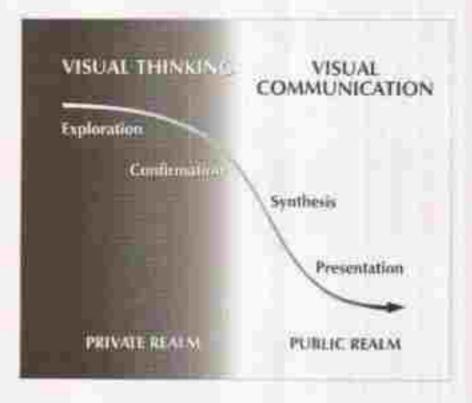


Fig. 2. 1), and the property of the property o

Complicion systiables

Because the GES users are trained in contegraphs, symbolication and design, it will be necessary to create expert systems that legically translate intermatibet into graphs, deploys. Jusques Bernis, the French cartegraphies / graphic thantia. It has had a important output on our approach to the pro-Dem. The Rompson et. at., not a pro-in that is used by 50% of intervalsations carting apitor courses in the country (Physics, 1960) cases bernin's basic errorm of graphic courses in the country (Physics, 1960) cases bernin's basic errorm of graphic courses in the country (Physics, 1960) cases bernin's basic errorm of graphic courses in the country (Physics, 1960) cases bernin's basic errorm of graphic courses in the function and units we can use to build a map times. Mammoniar and Julianem's 10770 meant guide to map design for city from the functional (1980), in a proper on map design for CDS, and Molley and Zesbert (1980), in a paper on expert systems for map design, scarps this sestem as a base to build from in destigning expert systems for map symbologism.

An important representative home for vince instants of incertainty, therefore, is how there is graphic strables with possible additions or residing must be injured which can be logically matched with different kinds of data inscertainty. A strategic distinction of course, is that between ordered and differential graphic variables which can be logically associated with arithmed memorical and manuscript categorical differences and appropriate for displicitly, inocuments in pumping a residence and personal properties to displifing modulars in pumpings) between the inocitability of reminal information. Testing, although it has an order, mode were been in a luminy constitution of foreign enough; and finit ordain enough; that could be used for order enough;

Although Bertin upreend it, me graphic variable that is argust to the most liquid one to the depeting on artistry is roles saturation. Source in whiled to the list of variables by Morrison (1974), a superiment





Figure 5 arms (10% Countries)





Figure 1: Experiment of the common of the co

reinted to as color partity. Sommon could be varied from particles for two certain information to uncaturated (grey) buts for two extra information. Another certainly, beyond Rector's original access. That seems quite providing as an uncertainty countration and is factor of Proceeding data four of focus. On you sential seems and in factor customs of comply at homes sputted recolution, magnit be an ideal way to deput to focus rainty.

Symbol tomorain be many-lated in at heat from ways-

Contour originals—The misor obvious way treapply more is to vary the "crisposes" or "teactypose" of symbol contours below. A contain boundary (e.g., the U.S. Consula to other) might be skyreted with a sharp, narrow line, a bale an uncertain boundary or g. (BM between Kurwart and fraig) might be portrayed with a boundary transition of bulles from the contact based the bull-ground like to binder "out-of-base" symbols could be used to represent certain or intention bearing of point teatures, and an area may be depoint as not bounded at all, the as falling in a continuous tashing from core to periphery (ii...4).

Fill clarity. While content conquere intrincely reggo its oncertainty in position, the crispinous of elements including up lanerine fills he in either who parallely delimited arm can be legically associated with attribute intertainty. A sharp, distinct pattern, for example, ought be used to indicate certainty while a loss distinct pattern might indicate uncertainty (fig. 5).

Fig.—The transportment of the "amorphism" that an applications is a map the neighbor to exceed the controlled on some computer display discuss. It is possible to create to hat, in other, looks like a tag parametrization that part of makest and the map.—the thicker the tag, the more uncertain that part of the map (e.g., to).

Resolution — Olies image are produced to solve intribute data, goographic presence, and temporal position are depicted sorphours different resolutions. One medical of communicating oncernitate exallelity in adjust the resolution of geographic detail so that it corresponds to the or anothers or time (e.g. adjust resolution with which considers are depicted in a sound may be correspond to the resolution of sharpato, into matting depicted the Ti

Unking visualization tools to models of uncertainty

Different inscernmenty visualization tomes will arise when denting with different kinds of data to promilliant we data to be unfailed over versus quantificative stata from the criticis. When data are quantified aggregated to time such as counties, we should consider the gratial characteristics of the phenomena represented by these quantifies as we should consider the gratial characteristics of the phenomena represented by these quantifies as we estimate of spitial characteristics that can be also mised in that from the continuous of spitial characteristics that can be also mised in that from the phenomena to the phenomena to be continuous factors to the phenomena of contacts in the performance action space. Some phenomena to a tax titlest can very quantitativity as political boundaries are consect, in his others to a graties of gratiest water proper for integration per counts where exhibits a milatively success manner quaits independent or the purpose.

The same appears to be reported by the same of the sam

This shows a school to Make to end that during the SCOOK New York of Data.

Quality (goods) the tray.

proposed a series of graphic data match that represent hardists on this continuity absorption place are series appeared by These graphic data matches are possible a mage of two dimensional symbolization methods, which is matches standard forms such as fact, this eightest, sopplett, and gradiented symbol, along with some helpful authorages designed to draft with the midpoints on the phenomena space was till.

Three remarch spendens request themselves bery first safe to meaning that the spatial characterislics of stoccetality, will minte those of the phenomena that anomamy is being authorated and. Do specific emple distribution methods scradle communicate the party silar apollid. characteristics that no as cartograpriors amortilize thous with targe, is a bases motion Sustainment most Appleting smooth may be as politation estimates sitterprenal es a serve the continuous surface on asdiscrete smoothlinty regions? What approach should be sollowed in here in a tasta size! In an impolitable kinds. as amornants associated with it. and the spatial characteristics of that uncertainty ware?

User interfaces - How to surge date and oncertainty representations

Permit the heals into of face in represent observatory is the question of how and when to present the expresentation. These countries that by the likelihood that GIS representations are other products of a combination of assented and poster demonstration and maintains of the There were to be three choices that could be used expression or to combined in

map poors to inhust a data map is deposited side by safe with a map of integrationsy about that data (fig. 100).

inspersely of presentation in which a over might be warred about movetainty with an initial map which is followed by a map of the data Hig. 111 for interserve hads that affine begging between the data and the uncertainty approximations:

Interval are interpretable to the same map (fig. 12).

Miss attempts thus far is graphically depart affectivity of spatial data have used the map pair strainer log. Bernaugh, 1988, MacEachnen, 1983, AtacEachren and Usealbon, 1987. Carriegraphers from spent relatively tribe time investigating the impact of sequential information presentation. For abilities of interactive susping and GS, as well as animation, here.

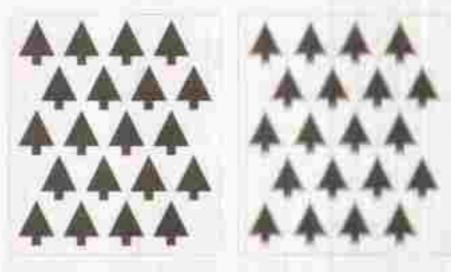


Figure 8: Great and constraining the or fundamentals.

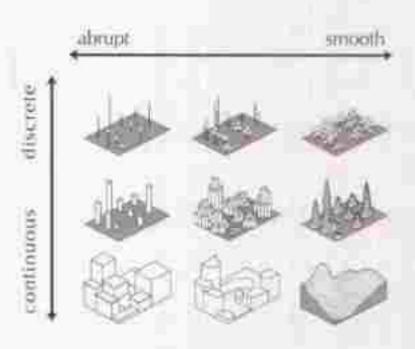




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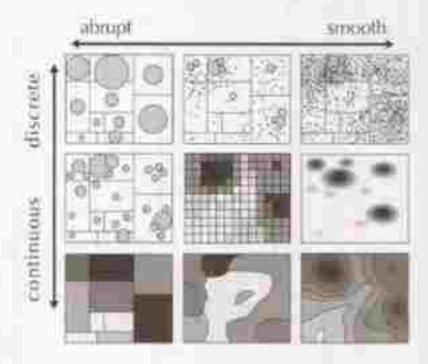


Figure 9: Procedo (2) compressor o los (2) dels mateiras de la figure 8.

begins to being attention to this forms (Taylor, 1)=2. Slacem, 1980, Over clear average to explore form to the potential of hyperrest to allow themto environt through the mass of data and innormality representations that we might be able to purely to a set of graphic scripts to guide this process (Mostro inter-

in relation to the third possibility. became maps, the U.S. Census fillerage's bi-variate aborophills murefrom the 1000 primes are perhaps. the lend kine-in attempt in vehice tour manables on research, Experimontation with those maps by several researchers indicates that outnessed renders have yousideenlike anable moding be easing mayto a Obers, 1981). There are, harrierys, a number of his sample. reapping possibilities that have been molyang bay bimgitesini mod previous attempts to use by attate mays dealt with two different variables rarber. them with a sizedle supublic reliated to its imperiority. Color asturation for intendigly for example, might be pseul av a graphic variable for departing uncortainty on targe in which different times are used for represent the date values of feltrend least one stand cover must be For it is blish here, a while of regard building conditionation of restrict and salue may be expective two sig. 123. The corrable of focus might be misk insmiller was w.

to a dryumer visualization environment, it brould be possible. to combine sequenting and hiwar hade been regioner areas a bloom in Finder icom a itsecreop; through a detail ancestality map, back to the data map. Fire quaditative areal data bracsensit Fisher (1971) has unappoint an sigmodest technique to uponaumionte the ordinary but suscentillated in wall characteristics for porticular twotimes. In his wisconication evolution, chiestion with eshock place our distributed in a particular color to transfeed to the probability of that posit being in a puracular soil

classification. Certain serious of the map remain state and uncertain, sects on exhibit overmost blocking between or arrange, the polymost with for that place.

Evaluation of the utility or affect of providing uncertainty information is a relatively assy to ship), up techniques by which uncertainty assert be represented. Before my try to put these to limited into practice (postice tarly in a public policy content), we should evaluate their policy impact. The expresentation of uncertainty about information in a GHi provides a unique opportunity to determine exactles are attents at map symbolization and design resourch over the past of pure base provided the taxis.

required to develop a representation system. If past perceptual and committee requires along with the conceptual models of extract between relation-











Julie Julies

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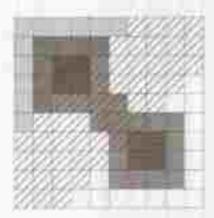
per full hear a digital tree of extendingly of them.

to formalitie hypotheses and design appropriate copic mands in star quest for convers about whoulking mannality.

This possibility may length women of an integration in contracts the communication model approach to contegraphy. Communication of data appellity or an approach was developed. Uncertainty can be treated as a processly defined piece of uninternal numbers of supposed and the contract of the contract of

The first energy of a reset to be award of the range of familiar over illimachous with graphics that occur from truthal data explanation to produce the explanation of the range of the explanation of the

In addition to the insertion of viscolities are expectable, there is also a specific or quality of viscolities by consider. One stay to evaluate a small control insertainty tools, therefore, is to collinear those tools in terms of their terchanic toward type I and type II recommons accurate (Chick-arbite and Conner, 1990). Does previous siting uncertainty information for permitting it in a particular toward had to a faiture to notice patterns and relationalities there in a particular toward had to a faiture to notice patterns and relationalities there in a previous manner to see patterns that do not add the not add to permitted the control of the second process of the second process of the second process of the second process of the control of the control of the control of the presentation method. Oversion, representing the assumement in the control of representation is an inscription endoared at best.



ACKNOWLEDGEMENTS

Dworld like to these David Offices and Tony Williams for suggestions on an entire draft of this paper, Alm Browns for sharing their as to variable maps of uncontainty, and Catherine Rector in the Desty Go/Craphics Laboratory for the production of most of the illustrations.

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Cuendo se quan mujos como trabiomentos de conaciones la esploración de relaciones spotembran procede a la presentación de datos. En estrupción de extración de malle de completa de especial de la diferença como la cimulidad de la diferença como la cimulidad de la diferença como la cimulidad de la diferencia de la diferencia de especial de e

RESUMEN

reviews

BOOK REVIEW

Geofogical Mages As Infreduction Alex Addresss, New York Van Neutrand Rembold, 1990, 224 pp. maps, diagn., and foldus, 549 sh cloth (250N: 0-442-3000)-0.

Assumpt by Nomine Made Department of Community Estitioner State Managing Set Researches

Coologic expression reslays the prominent applied users of male-The three-discovalental statute of ment gerboute phenomena means that geologists most be able to road and manipulate a twodirectional may in many worse unmagoned by most accuraghers. Perhaps the awat diffection come: for anthromediate goologists to promise to the prolitical field compsubcrit postegical triage are grade. Thus, the complexes of the techniques assures a need for illustrated books abovenug the fundamentals of geologic map-

This book is a welcome addition. to the spurse literature of this nield. Districtional of fifteen consists chapters, with on a specific expect. of geologic maps, the example, entities of hims, partitoying strike and dip ancommunity, and tolds. The chapters are liberally titustrated with block diagrams and sorr to and figures summarizing untless topics, and eight full-color. geologic map plates are meladed. There are also chapters on topics peripheral to interpreting genlegamaje, with as on elif and new techniques of producing mysleus. straye, as well as on the business of geologic maymidding in filmain. school greeleght mapping counfully originated.

The book is usuably limited to a alternation of geologic maps produced in thinking and its former commes, especially the Limed Statics, Canada, Australia and New Zealand. Discussion of passence mapping in other regions is mainly limited to a sew examples from France. Despite this limited prographs, coverage, there are substantial intercontenal differences between greeky's maps in the linguish operating regions, the sale comparison of maps produced by different mapping traditions is a landable aspect of this book.

Excharger nucledes a braid introduction, a discission of the topic a chapter emmany and an asutable this lography. Accentparrying each chapter are served. irup exercises demonstrating the principles introduced in it. Many than thorty beauty or employing erap, but it is left to the reader becomplete their because po moressolutions are included. Because the 21 map exercises are based on 8.57 = 177 black and to blue maps. they can be untilly regraduous for repeated personal trials or class-POCEST LENG.

It is apparent form the appear tuted hill-liveraphy that several busios about geologic mapping: have been published since I committed toy prological field categolis, 1983, where this kind of reference book was unavailable Although this book would have here an extremely model submerce. brook at field comp. I mucht rust have graduated if my instructioncould have assigned work of the complex exercises that it includes: There is no quantities that anyone schools able to complete all of the granteness will have a thiorough knowledge of prohipse maps and the sections interpretative by breigner that can be employed.

There are a real more problems with this best, but none that decounting one from recommending it. Although Licenst a few types of consists that continues the types of American reality will find a surprisingly great difference between flows.

and American opilling of anologiall terminology, is built awald be continuing to the review his this use of computer-typeset hitte, a: publishes could mell's free printings of a secrettific test when the terminality's is this divorage, with rectified using the levicor of the appropriate audience in addition. address this book is restly are begrestoralistic to a greekepter vettle a worthing knowing profibe goologic time scale and bosse probagic principles, some of the Manifold recent shares of binco test for the typical American prology sindergraduate to use without each took armend knowledge. More Importantly, is vest of the black and ethile exercises are sample from complex to use conventional pattern symbols to differentiate the stees. For exempte, because faint Laurillan with the good-sty of the Barabara, Wineymain arus, I aitt omymout that I must not determine the geological binnery of the region to the example magnetic in the number, given the cortestaplik complicate of the map included Thus, I little concerned that some OI the other eventise maps might be similarly figured. Fraulty, Particular recomming that the next edition technica geologic time scale and a Chapter pumpher of accompany ting a saycher indichters.

Despite these entirions, this book is an excellent reference land. for field goolegism. The diagrams then ever up aight that partialigns. almost a stall a surface production of a fact of without reference to the tool. Although the book will be more useful as a reference or field comptest, his one the highlight of this black was the entertaining slowler. whost wine famous goolings: mappion. Like many Welchings. Professor Mailtman as an excellent story teller. He has drow as good at 105 seeming cipristating receive about some famous greekgish ashickow in clarifying the excendingly. sumplex techniques of goolegic inagricos.

BOOK REVIEW

Geographical Topornation Spatons, Principles and Applications, D.I. Magninis, M.F. Goodenild, and D.W. Bhind Ledo. Loss, England Language Scientific & Technical, 1992, Vol. 1, Principles, 629 pp. Vol. 2, Applications, 447 pp. 5295 Hardineses, 0300 0-382,05601 ea (Copublished in the United States with later Wiley & Sons, Inc., New York, 0580 0-470-2170-8)

Revised by E. Ljum Deep. Deperture of Gorgensta. University of Wiscoulds.

Congregate Information Systems (CIS) have developed to a stage where production of a large reference compendium is not large foundity, as the editors mate or their. preface to this levels, but incurringly. This two-volume set is a milestone in the continuing development of Core in threw respects their it. premate a compactionity view of Gib as an emerging technology; severed, il primildo à refenence work for researchery and gracticring GPS professiontals; and third, it attempts to develop the basis of GB as a discipline. The stated also of the book is he amonified a room. of atternational experts to write a major rencessor seach on Cife. Although there is a significant Sinth American and European spuritcularly the United Kingdows hias, the extitors futire accomphillied this aim. With mily a low thates in the propertation, the work by a programmed as between the said selff probably sover as the mace: GES relationals for some years to (Conn.

The book is well regarded into four feetings. Our introductory mercury with a glit chapters estimating the definitions, history, estimate and estimates at GIS 21 principles of GD containing of 25 chapters arranged into subsections concerning the notage of spatial

data, digital representation. frommonal, display, and operational issues: Topplications of CDS with 22 chapters in four subsecbise favoration; setting and informational programs, somerestocenic current gururanist and mesagement applications, and 4) en epidogue which briefly summaricce the main wheet and presents projections for the future. The editors for the work together by pinividing an introductory article for each of the first three sections and by authoring the crulopon The buok contents a table of contents, prefere and list of contribution with attribution and rewarch interests reported in such of the two volumes. While each article contains its own whoemorlist, each volume mutains a committated bibliography of some til pages, a sin-page list of accopym delimitions, an author index which oncludes page numbers where citations occur, and an extensive subsect index. The repetition of the bibliography and. milions affered such vollame to be used independently but at the cost lift fibe joints proces-

The livest to it good, comprehenserie work moeting the need in the CIS area for such a reference volume. It is similar in some respects to the Massel of Floridpromotelly and the Manual of Remark Serving published by the American Sciences for Photogrammency and Remote Sensing, Incr. wilder these manuals this book does not present a rigid, backed account of CIS. For example, one cannot use this book to learn how bi-program a situatiree didu attraction or how to use multipool. algorithm to extract referant pagegraphical data attributes, as seculd be superted in a marrial. The articles are more of a system. approach, some with sportdation and futurism. The beek does printide an excellent incontinu of the general principles and applicathins of GPS, which is the lines. It is aimed at advanced undergraduers, protegratures, protectionals, and rescards workers and succonds at presenting the appropriate information to the largest and soc-

At the same time, GPs is an area: where and come has been scores. Her book is an althought and the ealthers become if the fact sharing the applications part of the work, no examples of CIS follows ore: included. The tree chapter which those favor criticism focuses in ideas of orritaryphy's dumine, the bounter stitionalbus, surrounding CIS; and the Archaettana of nuces before implementation or experimentation. That GIS inchese improved sputial analysis to usually not questioned, but this impact in the weakest of the seature. and true sparial analysis is morepenaled in few II and GIS. Several chaptery or they work acho this-CTINGSON AN YORK ON THE STREET, NAME AND ADDRESS OF THE PARTY AND ADDRE of GIB to handle three-denominated and temperal data. Also, the chapter criticisis Celevisonches. and practitioners to be are quick to subspit time paradigree learners by object-entirelation has captured the GE collective imagination) and builtimp as the solicion to expresentation of goographic data. before any implementation or experimentation has been performat.

The section on principles of GES forms the core or the storic and the effices introduction identifies a small transfer of organizing policiples which have entempt to GES motor versus tortus, spary terms product, and spatial analysis versus reputal information. The pracciples are organized by alontrying key scentrol quantities of GES which feetings the nature of spanish data, digital representation, functional, display, and operational tours.

The applications section is a greed compling of the possible types of GBS applications. Its limitation is that the breadth of the current and potential applications cannot be effectively represented to a simple volume.

in the epdogoo the eduors. pollact on the ideas presented (from ghour the book and make some Milenson's about the carrent station of CDS with a programms for the fathers. It examines the outstimiling inseed in the research agenda, presections to the rese-2000, and how GIS the to the bygger societal nimms. Bristly examining its history, the editors think GIS is converging spem's set. of general issues through the now of technology. These times rectado deta capture data modelirror, accorney, data volume, spanist malysis, user interfaces, cost/ benefit analysis, and impacts on recommissions. An organism is made for speaking time mallion. science make al of the technology or GIS. While U.S was smor seen. entity to occurs his graph, it is more viewed as accounted the world represented by maps. Deciding a purallel to statistical pockages, GBs irraid to be at the stage of these packages in 1959. Sutlettice emerced as a discipline, natt G15. do the same or well it holow the path of comoton sensing and remain the not food grantiquestioned for all squattal scientists.3

While GIS-has many of the paperson of a discipline, including journals, trade press, centerences, postbooks, ordings of more and corrients, is there a fundamental set of problems for CIS to examine? Two views or GIS and put forecard, one or which GIS tollows the party of the quantitudies revolution in grouping in the 1960s. Today time josspraphics. particularly human co-graphers. one concerned, write quantifications: This year portures CBS as the Exact of electronic data processing: The second view properly mediaund convergence of ideas, discrplace, twitteningles, and a trend for the various application at one for remain additional. The edition proter the second view and

exponent upon it in projections for: GIS to the year 2000.

In summary, the book is a major: step in developing a comprehensive view at GIS. While time may not agree with the stormants in the introduction or the surfaces fund there is contradiction among the contribution(), the editions are to be commended on the production of such a perference work. Player, such as inclusion of the subsection titles sinty in the table of combonic and not in the subscriptors flownetwo, notice although references is finite also and appear in the reliefency list or in the comodidated Sombless and a law subgraphed grantenatical errors, our mister One mayor problem to the color plates. Most and tax social tis beeffective bottle as many as wight per pagel, particularly to the applications section; and in some cases the graphace are completely. siteathin. This problem notwithstanding the book is an excellent presentation of the framework of GIS petiti tolos and providen a transmable instead of the proper Clex application areas with a few detailed examples. The editors elect make thereon in their intraductions and tie the 56 chapters together well. This work is likely to became required inference. readerful for C25 stinfepts and practitionicou it certainly beforeson the bookship of every CIS. pro-motion.

cartographic perspectives on the news

Landaut compart inflation will reach a major inflations on September 10, 1992, when texpuyer substitution of the program such. Landaut is the United States Civil remote soming autiditie system operated by the Tarth Observation Solellin Company (LOSAT). LESAT as minored it wintiff assume upon

tion costs for Landrid on October 1, saving the taxpayer \$10 million in Fiscal Your 1993. Landsot 6 will be completed and delivered to the government in October and NOAA has setted filed in Lounch for Jonatory 23, 1993.

The first Landold was largered to 1972, since that time, an archiveof mer 27 million images have boot orasted. These images are extremely valuable and metal for stateging, restatedy and marithus and the Earth's nominal resources. The Lamburt Flurmanic Marrier r FAO services collects data from a broad region of the electromagnets; spectrum that includes quickle bunds, how infrared. Southware Infrared, and Human scovelereptio. With Landact's TM Min. Birmeter resolution and large ates correspond 000 a 100 miles; the service beloated exhibiting recess tion of relatively little contract and area, compared to aerail photograpily in other commercial sandline data. In addition, Landont him tepeal coverage overy 16 days.

TM state to well setted for many attripoper and applications and in used to inventory and muritire world reserve on widdless feel man marine environments and minutals. Carlo Adares, at ECSAT, butcomplied a brief description in Compatibilities of emphasis quick monitoring using Therostic Mapper data. Exemples include the one of Landon TM data in Street Information lists a prographic information assembly the Strumence Hiver Water Manager ment District to bein the organinews and planning staff assess. teleperated cower is changing and to locate arrain referen land one could have surface water. Showline changes in the Arel Sea are hearganatysist by comparing the 1977 MACO received and 1987. mosaic The Unified States No-Serval Count Watch Programs intends ficuse TM data to descrip: a comprehensive reithmatte. Manufardined GIS to seven changes in land over and habitat in the rodulal regions of the United States.

Bossonse TM data provides cutrem, land overer intermedians, if can be send to map arrow count, update intuit runil boundaries. and identify the oreas frage intebut plainting. Further examples of The data was for oil spill tracking. wester quality assessment, air pointing, and plobal correction demonstrate this yest amount of simplythan and nutpining uses of Landast imagery and shisi-Limitsat it will pravide syste fartilism value of this data to the margining community with the introduction of a 15 metar pairchromatic hand-

EXEAT is interested in making Landon data grains wailable to resemble to They have made an agreement with NASA to dedicate up to 25% of productive expactly to the coffection of resourch data selected by NASA, which will then pay 50% of the lost price for this data set and will distribute the data to resemble to the formal or all over all over all over all over all over the set and the set and the set all over t

recent publications

GEOGRAPHIC INFORMATION SYSTEMS

A publication resided Geographic Information Systems (GIS) and Mapping — Standard Latine and Applications (STI's 1128 or available from the American Society for Testing and Materials. It contains twenty-six papers from a 1930 Symposius exceptaint for the United States Geological Survey and the American Society for Testing and Materials (ASTM).

Section D18.01.03 am Bernote Sensing and OHSBUR on Mapping and CPs. The purpose of the symposium was to him; together engineers and scheduling to possible. a former for exchanging experiencen and findings raished to GIS: learn from a variety of applicaflens: premote technology transtree and previde ofpoanenal. restutors for CDS, mayor and remote screens. Persons destroyed copy of the publication should contact the ASTM Marketing and Soles Office, 1916 Sace Street, Philiadelphia, Pennsylvania 19107 (215) 209-3530.

A number of current publications you provide the second the American Society for Chologrammetry and Remote Summing (ASPRS). Transinclude: Geographic Informations Soutema A Golde to the Technolegy by lister Autonocci, Blay British Peter Criminal Michael Keyang, and Hugh Archer; Introdischary Rendings in Geographic Information Systems, edited by Dennis Floogist and Dume Maritle: The Integration of Remark Sensing and Geographic Information Systems (Proceedings of a special NCGIA resisted held in the 1991 ASPRS-ACSM Annual Meeting). To obtain a price list and more information, unstact. ASTRE P.O. Box 1269, Errore City. PA 1603) (412) 772-0000 for (412) 772-5291

The Extension Service of the University of Minnesony has related a 12 page publication titled Introduction to Data Analysis Uning Geographic Information Systems. The publication provides basic information about the malyrical experiment of geographic information systems and describes some or the computer programmed by a GPS for map analysis. The even of the publications is \$2. To order, requisit items.

NRI-RO-R740 and send a check or money order popular to the University of Alimenada to Distribution Centur, 3 Contro Hall, Centerally of Minnesota, 1420 Erkles Ave. 52 Paul, MN 35105-0064. The Telephone distribution the Distribution Century in 125-625-9375. Their Extent Tax ID number in 41-907513.

DIGITAL DATA AND ELECTRONIC ATLASES

fisuteric Mapping has arranaced. the release of StreetBase Plas tikes. The files are derived from Denamer 2000, an enhanced set of TICER (the reterrally developed by Geographic Data Technology Streether Plan parvales a higher and each unit change within period to Streetflances stratulated DCER files. Shoutfleie Plus files. continue more than the paid safdress ranges, any rode informetam for all street types and tompor street segments. In addition to the requirements for naturing Affini Software, your government be reproposed to the or hotel 2 MB RAM and DOS A Fee higher Contact: Strategic Mapping, Inc., 4030 Moorpurk Ave. Sunt 250,5m lose CA 95117; (40K) 965-7400; fax J4HH IIII54(859).

Omnigraphics has amounted a now agrees. The Owner Consettings. State System. The suries will cover all Steame individually and will twavallable starting in September with the them distributed of New tion date: Each volume will cover. a state a propolatist places, plusstructures, facilities, boratos, historical places, Lendmerks, and named goographic homose, but throng impremation contact: Paul Raigers, Ommanustration, Ita-Penedracia Building Detroit All 48226: (WWW-254-154) En CLIVENYESSE.

Applied Optical Media Corporation has two CEFROM address available for sale. American Viene, an atlas of the United States, has a wanted instortion that provides accore to a vick undifficulty exist-CONTROL WEST, INCOME STAIN SOO Megatiyses of maps, information. pretures and sound. High resolution maps, topographical pours. rescure and industry maps more. Hammond Inc. and sure hable date months 1990 U.S. Cenne. Basid police Chief. Waste Vista. an international affair, recitable magnitude data of the same reputs-Royal the old Scent Union. It also bus arress to a rich milliondia. environment with more than 600 Magathytics of maps, information. pictures, and seried. It includes high mechation maps and data from Rand McNally. Bankl Price. \$74.00. System Kentherman har Deetle presidente note MPC: MPC in Smar PC with CD-ROW drive and sound and musting MPC specificathere's with 2 MH or RAM; or burst 640-004, 256 sofor display capabilities (S12K-VE/SM) and Windows 3.1 (Windows 3.0 only it Multimethe Latera can be by properly mendled). For the Marintante Color Macintosh with 2 MB RAM purning System 7.0 For more information contact: Applied Optimal Media Committee, 1450 Book Blood, Bollding 400. Westchester, PA 18568 (215) 429 5791, Aux (215) 429-3610

MAPPING

Microlanges Press recently innertured the publication of A. Grade to Map and Image Processing by Dr. Merri P. Hierita. This 282-page, will cover estimate a technical reference of this selection and one of a wound generation deskitop or tripusp interocumpation return for integrated Gas, opage processing CAD, spatial databases. AM: FM, and deskitop mapping. The retuil price is \$50. Contact.

Microlegages, Inc. 701 North 6th Street, Some 15, Limoln, Nebusiko, nei08-1347 (403) 475-4934

MAPPING SOFTWARE

GEOVISION, Inc. has released. StatMopHJ, StatMopHI for Windows in a statistical property program that pennishes the capability to mobile detriographic dista values to prographic coordinate. files in order to courte thematic maps for acceptance and presenttion StatMapdII allows direct personal for U.S. Common Represent TRGER has compraint 1990 Consists databases. The concernm system requirements are MS-DOS 2.11 or later: Microsoft Windows Jill or: later: PC malog up 88286 or better. 24th memory. Florgry disk-drave. Hand dish (40 MB mindmum), EX.A. or VGA graphics idapter and mention Microsoft Mouse or companie device. Contact GEOVISION, Inc., 548-8 First Steen Parkness, Northwest, Goorgia 30092; (400) 448-8224, has 14010 147-455

NEAP USE:

The National Council for Gavgraphe Education has printened The Language of Mayor, in the first movingraph in their Perioss in Generality Series. The publication, antisonal by Embour Phil Generall of the University of Minnesota, is a supplementary minuted that introduces students his the language at used to express lidean about spatial relationships. The volume is recommended for use its introductory courses to prography and marrocading Lorder covered include basic spetial concepts, various types of rugs and analytical tools used by the map washer spenial Most of distance direction, and, and volume, water and gride and dramage, withcome and locat

pattern, etc. To order, send \$25 plus \$2 for shipping and Kandling payable to the National Council for Geographic Education to National Council for Geograph's Education WA Lamourd Hill, Incluing University of Perceylvoma, Indiana, Ponnsylvania 157(8-1087) 1442; 537-6290.

The Third fidition of Map Use, Resulting - Analysis - Interpretation written by Phillip C.

Maching a street extract by Infants O. Maching a street extract by Infants O. Maching a street and lights. The new edition has even by infants the new edition, 10 new chapters, even lies added to each chapter, bear updates man beginning to end and none information about the impact of electronic technology. To endivisely a pheckure turney order for \$32 to 10 Publications, P.C. Box 1477 Machiner, Windows \$3744.

MARS

The Association of Caraction Map. Libraries and Arrange (ACMLA) is obserbug. Shoudard Topographical. Maps of Canada, 1964-1948, a 31pupe millioner booklast that lists may profit and by stayers 15 section for the Canadian Coverement. The maps show recountilly straight, fallow, travers, and attenues for different atms of Canada. Inaddition, the book includes 22 map short illustrations. The cost is 510. Also evallable atc Early Camadian Topographic Map Series: the Gentlegical Surpey of Causala, 1942-1949, and Sectional Maps of Western Canada, 1871-1955. An Early Considered Topographic May Serus. These softencer booklets but sheets of wichinsal maps that cuttain township boundaries and topographic nutures. Each costs \$15. Contact: ACMLA, con MAPS. National Archives of Canada. Ottewn, Canada KIA (INO) 16TH SHELIDA

indicated from page 2.

announcements

received for B.5. (legate in cluminary (1961), and in M.5. (1961) and the D. (1966) degrees from the Uniteralty of Wasconte in cartingcepting and educational psychology.

Hartuna aretrificated wave due 50 efficies, textenix, and essays to the professional literature on logics related to map design, education, copposite procladings and himsen factors, and computed assisted vehicle may gatter, and the littligent Vehicle Highway Synom (IVHO) the Is probably most well incognised for his coauthored book on The Norman Alon (with Arthur H. Robinson).

flarbury was a member of the North American Carrographic Information Society, the American Cartographic Association, The Afrangean Congress on Surveying and Mapping, the Association of Afternoon Geographers, and the International Cartingraphs: Asserparties. Her service in these organizations included fairning other things) Chair of the U.S. Natheral Committee for R'A, U.S. Names Committee for RAL Editorial Board of The American Carriagrapher traver Carriagraphs and Gaugaghic Inhomation systemat. Committee for Authurobile Netturibural Aida Society of Assumptive Engineers, and most recently Vice President of the International Cortographic Almociation. Het disdication and controls dieses to the corregtophic countrastity will be sonely missed.

Memorial communication on be made to either Executive Deerstor, Northe estim Medical family Foundation, 600 N. Lakeshote Drive, finite 1114. Chicago, IL 10411, or the factoral Pendemic Memorial Fund, c/o David, Woodson's Louversty of Woodson's Department of Geographic, 550 N. Para Sepres, Madicia, 641 5270 (the latter will be used to fond an intervisionally species and armal children's mapping competitions.

I.B. Hattey Research Fellowships in the History of Cartography

A fixed in the numery of the late Phylosein Brian Harley (Professor: at the Gregority Department of the University of Wisconsul-Mills acker? has been militared to support the LR Horizs Research Followallow to the Harry of Contrasuchly. The tanger of \$40,00 well. found sup no threat felloweships per your, each of one month's done tion. Among pursuing advanced research in the field will be olipinle, whatever their nationality, disciplina or protession. Trefetsecond by given in interpretive stindies reflecting the rotable contributions made by Prolimer Harley. The awarth will provide apportunity for intensive sew of the major Lendon Collections. mutably the irrisch Labrary, Notional Maritime Misseum, Fabili-Record Office and Revol Congraphical Society, as well as others settlem reach of London. The Fellowships will provide welcome stimulus to the academic study of the bistory of carrography worldwride. It is armorpaled that meet or the applicants will come times certaids the Linded Kingdom. The Trust's officers my Pythonor P.D.A. Harvey (Chairman), Dr. Catherine Delgani Smith (Hos-Dominocri sed, as Fron Secretary, Terry Compheli, British Library Mag Liberry, Great Burnell Street, Lundon WC 18 HX., to whom comminutions (The Lift, Harley Reserve Fellowships (Your Family on countries may be weet.

ACSM 20th Annual Map Design Competition

The American Conograptics Association of the American Congress on Surveying and Mapping (ACSA) is again upon soring their minual Map Design

Competition to promote bitiseed in may design and his recognition significant design advances in carrography. The May Design Logspolitical is open to all mappinal costs in the United States and Capada. Noted cartugraphen and designers inducentries head. on achievement of statud labourtypes polor, everall design and incomics, craftsmuskip and typisgraphic. The siming emisswill be calibited in February 15-DC 1993 at the ACSVLAHMOR convention to New Orleans. Louisiana: Extriscourculso be-Absplayed at a regulater of other nulliscal and international procesmental freedomy and will become part of the personnell collection of the U.S. Library of Compress, All. winteen will receive nultification at light free westscheider für ACSW Arranal Convertition. Cosh personwill be rounded in turness categothes. Only maps oumpleted and/ or published in 1992 are employ-The deadling for stitles is Decem-New 15, 1992. For stone information contact: Ms. Dierdre Berington-Attenti: ACSM Map Design Compelition, V/o Cartographic Divinium, National Geographic Magazine, 1800M Street NW Washington, D.C. 2005e.

1492: An Ongotting Voyage In Append The Library of Company repetied is assume Quantitations. exhibition, 1972: As Digning Vanno: The exhibition addresses the worlds of America and the Meditureassum on the eve of 1497. and looks at Columbia's varyages and their amittating comesporatory in the American from 1492-1600. The exhibition draws extensively on the rich collections of the Library of Congress and Is complemented by effects from other institutions such as the l'acpost Morgan Library, Tulane-Univers sity; the San Administration of

Art, the Moseum for Volkerkunde (Victima), the Albers Art Gallery and from prevate individuals

The exhibition imbulgates introductors him as well as 21 highlighted stations that former withfunding mosarus room the 19th and 16th centuries. FARD Sta-Chapmen Visually is dividual into three sections. 'On the Exwell. (44% "The Allambe Veyage" and Hampy Claims America. Among the tiving on absplay in the endulist are The Library's unique 1537 Hurbertzinger (Mexico) Codes care Ulainsingtood discussions out display for the first brook Country Vopell's 1541 numberies terrestrini globe, a 16th century see chain gentrians of the Eastern Mediumrancest, the 1997 Johann Rosech. world sup in Palerry's Geographia, Dingo Cattiercoz a mugof America, and Marine Waldseamiller's 1507. Commenced for Astronomy to the which this nation. Authorises first appears:

1892 As Oncome Viscopy will be on view in the Madusen Gallery of the Issues Madusen Merconnil Building, 101 Independency Avenue, ST, Iron August 15, 1992 through February 14, 1992, Flouris for the exhibition are 8,32 a.m., to \$30 p.m. Intendity - Friday, and \$30 p.m. Intendity - Friday, and \$30 a.m. to a p.m. Sittinday and Sunday.

Database on Geological Maps None Available As USGS Report

The Umbed States Caving of a Survey (USCS) has refused the bibliographic database of purlished prolegical maps for arises in the University and in Territories. The database, called CICCHNIDIO, contains up to data information on prolegic maps published by the USCS, take grotogical surveys, prosicione societies, and other publishers. The database is accompanied by USCS smeeth and retrieval scenisons called CSSEARCH

GEONNEY reignated in the

the 1908 to manage bibliographic John from the USOS Confestoil. Map indows (CAllis). The database was converted to DOS in themin Phios. GELWNINEX multides. sill date on the GMbc as well as data collected through and 1991. CSSEARCH was developed by the LSGS to words GEONNERS and other fielded databases on a processormater. The hardware roundromens are an HM-companthe winter IAI sustainment with newer recommended), highdensity 5.25 flappy disk from. hard disk with himmulaying space aveilable, EGA coler monthos, STEE RAM, evolum continuation. 20 ffus, 20 butters. The softbeare. restricted to DOS 3.20 cm. htphers.

A report on the database: waterfest GEOINDEX Dendescool Geologic Mean Associable Unity GSDEARCH South and Biresont 5 dieurs, has been prepared by H. Kit Fuller and Gregory B. Connells, and is gratiable in tenparts. Open Hill Report #1-575-A shocomentation only) to resultable Bir \$3.25 (prepar) or \$4 interpolation; Open-File Report 91-575 Bridgingbase, secreti suttycure, and docuprovintient is available for \$94 (14) 1.25 high thentity Roppy disks). These tierra can be ordered from CSCS florin and Open Fife Reports, Box 23425 Federal Center. Denvey: CO 80225. Trubule payment with your prior.

Michello Job Opportunities

Michaele Travel Publications has immediate opportunities for caragraphers of their U.S. head-sparties in Greenville. Scottle Carolina. These individuals will participate in all phoses of map making and printing and responsibility for compilation, unapoterabled design, preparation and on-press quality contralics of map Qualified conditions and a Buchiler's or Master's degree in compatibility or directly related.

neid, with a minimum 10 CPA, or 3-5 years professional experience. Knowledge of Macintosh, PC, and UNIX worksimion, and sensible programming skills are also useded. Pamillarity with cartigraphic actionie, data transdevelopment and minimum, or is required. Send resurce and other requirements to Dept CP, Michelm and Corporation, P43 they 1900), Corporation SC 28-02and

cartographic events

EVENTS CALENDAR 1992

August 1992: February 14, 1993.
The Exhibition 1492: An Ongoing.
Voyage: Library of Congress.
Madason Collery of the LenosMichigan Memorial Building, 101.
Independence Avenue, 5.E.,
Washington, D.C.

Septimiles 30: October 1: 20th Annual Conference of the International Visual Dieracy Association Imagery in Science and the Arts, Piroburg, PA Contact: Defortera Socia, Introductional Design and Technology, 4A16 Foibes One-hough, University of Disblurg, Pittsburg, PA 15560, 1127-148-739, fac 1412-1618-2011.

Oct-occor GISLYEX, the Geographic reformation Systems Conference and Exposition, Focusing on the Use of GIS in the Federal Government. The Washlington Fillium, Washington, D.C. Cornect USECK, Inc. 5 NO 445-450, Inc. (200) 445-5222

October 14-17

North American Cartographic Information Society XII America Meeting

The North American Corregraphic formulation Society will hold in realith annual meeting at the Ramodalina of St. Paul, MN. The prelimic mary program for this poor's meeting to listed on pages 31. 33 of the count of Correation of the count of Correation of Correspondic County, Programs Chair, Department of Coopraphy, University of North Copular at Greensham. Greenshem, Nt. 27412. (419) 734-730.

November 6-12: GES/125-1992 Annual Conference and Exposition, Sain Day; CA. Contucti ACSAL SATO Geneviror Lane, Belliesda, MD 20074: (201) 495-0200; fax (201) 495-8245.

1993

February 15-18: ACSM/ASPRS
Annual Convention, New Orhouse, LA. Contact, ACSM, 5410
Consvenue Lane, Bethoods, ACO, 20014, 2001 493-0200, (as 0071) 495-8745

February (1-18) 7th Annual Symposium on Geographic Information Systems in Forestry, Environmental and Natural Resources Management. Vancourser, Ornacl Colombia. Canada. Contact G15:93 Symposium (Mica, Suite 3rth 1040 Fignificon fitnest, Vancouver, Battal Colombia, Consila, Vall. 28th Hold 665-0188; fax (600-688-157). May 3-7: 16th International Cartographic Conference - ICC 93. Cologos, Germany, Contact conference Secretariat, ASM Congress Service, Chilastranic 57, G11 - 4005 Basel, Communy.

May 5-6 Geotechnica, the International Fair and Congress for Georgieces and Technology, Cologue, Cerramy, Coulast Koloblesso U.S. Representative Office, German American Chimber of Communication, fell Fami Avenue, 21st Floor, New York, NY 19103-0165, (212) 974-8636, day (212) 974-8636

April 6-9: Association of American Geographers Annual Meeting, Allinia, GA. Contact: Keetin Ellig, AAC, 1710 trafe St. ALW, Washington, D.C. 20035-3109, (202):234-1850

June 5-10. 84th Annual Conterence of the Geography and Map Division Special Libraries Association. Concernal, Cit. Conset. Mr. Alice C. I Indson, Chief, Map Division, N.Y.P.L. Sels Asymmeteral. (2nd Street, New York, NY 10018) (212) 430-01m.

Inne 23-29 XVib International Conference on the History of Cartography, Newborn Library, University of Chicago, Chicago, II.

NACIS mens

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Problem Tack L. Dedd.
Temposes Valley Authority, 1161
Market St., 118 (A. Chanaracons,
TN 37422-2001; set 5-733-5494

Use Physical: Jeff Patton, Department of Geography, University of North Carolina-Granuboro, Granuboro, NC 27412: 0030-334-5368. Sycutory: Craig Rennington, Geographic Department, University of Alaboria, Tisschiose, Al. 25207; Crist Mar 1536.

Discours: Edward J. Hall, 410 McColvery Hall, Kest State University, Kent, Olf. 44240-0001. G16: 672-2017.

For President James E. Fryman, Department of Geography, University of Northern Josep, Codar Falls, IA South (2010) 273-245.

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Hull McLean, 1602 Scorry Court, Hermiton, VA 22070, (703) \$14-5123

Him Minner, Map Literary, University of Verrande, Room 15 Huskins, Knowythe, TN 27996, 00251 974-4715.

Ruth Rewles, 337 Attrood Dr.; Leslague, XV 40015 (012) 564-5174.

John Sutherland, May Collection, Science Literary, University of George Libraries, Athem, GA 50002 (2011) 542-0000.

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CARTOGRAPHIC PERSPECTIVES

J. Hor Sona Karontz Andores, Department of Coography, 208 Soften Hall, 3413 N. Dolerter Average, University of Wiscomet-Missandore, Milwoodkey, VVI 53211, 1410 229-4872, tax 1410 229-3001; mail. according Level (married)

American Earlier David W. Tillian, Department of Geography, 208 Sabin Hall, University of Wisconum-Milwenium, Milwenium, W1 53211 (4110 229-486), for 1010 229-30511 of mail: iilliand/convex and memoria.

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Chart: Michael Potensor, Department of Geography, University of Nebrorka at Oroshia, Chinajia, KE 64162, 1402) 554-2662

MEMBERSHIP INFORMATION

For membership in the North American Cartingraphic Information becauty please IIII out the form at the took of this more with your name, address, name of your inguinatelion, some position and mechanical position and early along with a check parable to NACIS to Edward J. Half, Those more, Map Library 410 McGibrey Half, Kent State University, Kent. Off 442220011 Alimbertality for for the calendar your are as follows.

Indirection/ Regular \$28.00 U.S. Strategie \$8.00 U.S. Institutional: \$58.00 U.S.

Membership ters reclade subscription to Certagophic Prosperior and are char famoury 3.

Minutes of the NACIS Board Meeting March 21, 1992 St. Paul. Minnesota

Printlent Dodd called the meeting to order at 900 a.m. The tollowing Board mentions were present Hull McLaux, John Sutterland, Food Frystian, Joel Patters, Jack Dodd, Ed Hall, Jun Minten, Rotte Romies, Craig Romegaes, and Ran Bullon, Also present were Chris Baruth (Eastutive Director), Mike February (Chair, Editorial Board) and Greg Chu (Chair, Local Arrangements Committee).

Trumunce Report:

Freshleit Diold asked that the minutes from Board Mortings of October 201 21, and 23, 1991 be excepted and called upon ful Half to present the Transacto Report. Hall reports a bulance of \$23,203.10 in the NACIS account. Hall reports on a declining rate of interpret being partial on the balance: The spirke concerning the negal to a plantificable a Bursh account which will affew understand. deposits and withdrawals william is fore of interest account. Dodd supported the present on threely in-Auctro-of-controllating figuresial operations to Milworther and soked Barretti to explore benting endone in Westman, Hall reports. the membership of NACES totals 250 while tempers, 44 institle tionat, 197 personal and 29 stu-

NACES XII

buil Putters, program a bair, amcomment a call for purpers for the to. Paul purgram or various publications. Further anneouscements will be reade through a direct mailing from our entiting but of potential participants. The found soland that Cartingraphic Animation be added to the sugproted topics list on the call for purpers. The paper submissions.

deadline year nevert hack to hand 1. Diskil offices the support of the Board to said Pattern in arra way possible. Greg Cltu addressed the found encounting local arrangetoroty and offered potential goest speakers. The lited programs achedule will be distributed for discussion during our names telephone conference. Brent Alliant will be a co-chair with Chu on local arrangements. Ohe is mystigating possible local field trips, transportantile regularments. and scheduling. The Map Limury at the University of Alimproits will sifter a receptaint rise a post-bathquar night with a gathering or Churk restaurant to follow. Two coocurrund warkshops will be held at the University of Minnesota, One will address the uses of CarellHAW software and the other will deal is the utilimation surroughpley. Corrollment to lammed to 20 purpopunts in each workshop. After schedule was adopted as follows: Cored Workshop - \$50 for field conference participants, \$100 for: nest conference postsoporate and \$75 lest stoutente.

Assumated Cartegraphy Work shop - 3/10 full. \$125 non, and \$45 shopes. Interest continues for incorporating a scorkshop with Metassic plantingues as obeyed on post accumum. Five consiliusing shot will be set askin in each scotkshop for shutent participation. The probability of a Sunday surfeshop session exists if denoting a arrange. Consider or dots if denoting a arrange. Consider the property NACIS XII were offered by Rou festion as he propen the preparation selection as paccount pressing.

NACIS XIII

The found rectiment several prompts of the Washington investing as offered by Bolice. Final selection result to the Quality Hotel in Silver Springs, Maryland Dates for the meeting wall be limited to as not to conflict with N.C.G.E. Fred Anderson and Al-

Permain very suggested as possurfactoral armingement representation.

NACIS XI Final Report

The floard accepted a final fixpense/forome Report from Basuth on the Mijneacker meeting. In summary, the report showed expenses foraling \$6.356,007 and receipts totaling Scott 50 for a positive balance of \$158.70. Total: conference aducadance was reported at 92 promorpitate. Sutherland made a mother in matriotals the same he attention for full participants to NACIS All as . was established for NACIS XI. The matter was seconded and present. Jim Minton made a momine for a datty registration for hi be set at \$29 for students and \$45 for all abbut confehence perficiplints early notion. The motion was seconded and possed.

Cartographic Perspectives

Borotti ampounced that Sena Andrew-had received approval. from het Dem to sesume editorship of C.P. Barmin road at report purpared by Andrews so buch as all hims for progress. Hiringh this transitional period. Parien pomis out that me Publications Committee has in the post eversed som the fallow in the subjection of funtace articles. The from sike for the Publications Committee Chair GdBkg Petumon to bear knot revising the name at the Consultive to better reflect the function. Further, the term of service on the Committee and the philosoppi composition of the Continlitee numbers will be reviewed. An umphasis as academic representation on the Politications Committee was full to be an asset in projecting a scholarty image or C.P. The Board sine: in the principal that C.P. should take on the style of the Editor: Foresette allotted funds for publication software here not bean specificant remains at the disposal of

the Editor. Dodd ask flamily to curryey to Andrews the need to publish C.P. is a timely manner Doth! further receives floard. support the production of a brochurs which premotes C.T. in order to browler subscription. Chu supposts that the Review Compatible for referencing authors be placed in a mone prominent. pupe position to C.F., Ed Mail select to be released from the responsibility of maintaining the current state trass for C.P. marling Infields. It was agree that this limb scould be meyed to Mitamiliase Bellem asso Dodd to wint with the Fulfitor a multiplide three framer for C.P. prealiscion. The Board some in thursking Dove Diffuse and his shalf from these yours of service out Cartographic Perspectives.

NACIS Dues Increase

This motter was tabled for later allisonment.

Nominating Committee

Find Fryman soled that an annountercount by placed in C.P. for nonimations to fourth positions. Dodd encourages members of NACCS who have not served in the Board to consider running for a seat. Terms expire this year for Bolton, McLeau, Feintapez and Hall. A question areas conserving the maintenance of a permanent record of election results. Dodd will connect Dissus Riverta like clanification on this matter.

Membership Growth Subcommittee

In response to her interest, flarings. Trapule has been added to serve us; the subcommittee. Dodd will select a new class.

Centralization and Incorporation.
Bitruth reports that centralization of NACES operations continues in Milecopher. To operations don't be becauty in Westparin has been contented with florath as the trainer agent.

Mission Statement

The question arrive concerning the longuage of som unvalue statement as it believe to our occupposit status for proximal portion. Hamilti will investigate permit application procedures for millings more Mileculars.

NACIS XIV

The Build discussed promited all refor this envening, drawing from responses to a questionable epiters the source of a color trouble Doubt respects the use of a private research group to help in site reliculare to telleve Bellon of Disandress task. The Board Hilt that NACE shools continue to week schillermost from the memberships as to firmor siles. Esturn spoke in tiosocial Asheville, North Camilian As in the past, the problem of finding members to service in local arrangements committee limited the options. Several assertion of the Hourd typike. continuingly of the merry of Ottawa - Here the point was made that our Society's name had but freed up to our conference often refreshing should writte a general desire in incorporate more Canadiam time NACE Minton and McLeen will investigate tacilities and planning for all Ottows. commitment

Caringraphic Users Advisory Council Representative

Ed Hall was anninged to be the NACES representative to C.U.A.C. the accepted the normanion and term executed to the post. McCores offices a motion calling for NACES to support C.L.A.C. through a SSO annual contribution. The motion: passed altrediscussion. Pattern offices a motion calling for NACES to augment the Systemy's representamor to C.U.A.C. north a communal a contribution in ander to help. defray the costs of amouting mostleys. After discounted a Figure as 950 year arrived typen by the Burn! The motion was

Ensempthen through behavior bibliograms

Notebooks for President and Vice President

District spide of the value of miniterming a mulabook in the present through the subcreasion of Presidents to and an the community of the Security's recommendent. The is now collecting such a policycol.

Other Beniness

Minten asks that it become a practice of the President to present. a "State of the Society" report in the Board which would address constitute and appearing the part of office holders, and other matters schools reflect upon the well become of the Society. The imposition mutwith Board support. Samely school that a committee be formed to address digital bedsoology to the filtery withing Chicanggaranda farme workshop on the marker. Chic firther supposts that that McChimury much solve another conference westing concerning this important report. After hear discounts and viriding to the panes of humper, President Dodd finds that all necessary finalness has been completed and adjusting at 5 Hi pan.

Cong Rennington: Severen

EXCHANGE PUBLICATIONS

Campening Perspective gratefully acknowledges the publications linked technic with which we eggy exchange agreements. We continue to seek agreements with other publications.

articles, regular communitaries, latters, and inner on legislation, products and public administration of American Congress on Surveying and Mapping a Robinstin published as times a year. Green Lett. Membership Director, 5400 Grossomot Lane, Bettierda, Mill 20014; (2013-495-020).

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NACIS XII

Sartographic

October 14-17, 1992 St. Paul, Minnesota

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NACIS XII Conference Schedule (Preliminary)

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200 - 500 NACIS Board Morting.

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9:00-TLOO Opening Exhibits. Posters (Cash flar Social)

Thursday, Oct. 19.

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CONCURRENT SESSION D. "Electronic Atlases and Digital. Data Bases" Deposited Thomas Hiller

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Friday, Och 14

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CONCURRENT SELECTION 11 "Map Librarians Speak to Gengcaphers and Carriagraphies: What: We tan Do For You and How to Get What You Need From Us"

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2:00 =L00 SHSSRIN I Cartigraphile Education' Appeal and comment beautiful and appropriately compaction because Part to below water made of first and made the public sixty and surgery of the pools from Property Labor Eco.

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400-100 NACIS Board Meeting

Salarday, Oct. 17

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500 Wine and Churse Reception. Littleman, of Missessin May Library & Carrymony Liberton.

Workshops

NACIS XII

IBM-based Map Design and Production

Saturday, 10/17/92 9:00-12:00 moon

Cost 550.(\$100 for nufs registered participance, \$35 for registered stildents)

You will receive hands on training in creating maps using Corel Draw! 3.0. The differences between traditional and computer-assisted design methods will be malveed. Participants will receive a sec of public domain base map toles to take with them.

Software stud Instructor: Comi Drawl Aley-Gregory Cho. Director, carnerados Leb Diovessity of Minnesota

NOTE: This workshop may be offered again in the atternoon depending on the response.

IBM-based Animation

Saturday, 10/17/92 9-00-4-30

Cost \$70 (\$125 for nonregistered participants, \$45 for registered students)

You will learn the basic principles of designing and producing dynamic animated maps for broadcast purposes. The workshop will be conducted with a combinations, demonstrations, and hands on exercises. There will be apportunities for questions.

Software and Instructor
Autodesk American Process
Chilly I. Gerdinsk University of

1980

Macintosh Animation

Saturday, 10/17/92 9:00-4:00

Cost, \$75 (\$125 for nonregistered, participants, \$45 for registered stuckness)

You will explore the basic principles and techniques of cartographic ammation using a variety of suttoure demonstrated by five different instructors. Twenty-five Macintosh lici computers will be available to that workshop attenders will have hand-one operation in creating their own animations.

Software and Instructors:
MacCharre U, Adobe Permiere
and QuickTime - Michael
Penerson, Courreilly of Systembia
at Omatio.
Hypercard - Rikey Jacobs, Univerejay of Netropolos at Omatio
Macromind Director - John
Krigher and Catherine Robers.
Penners and State University:
David Tillen, University of Wiscounts - Milwarden.

FEATURED PAPERS

Tack improblement (Veryonon-includes building papers, edsich are referruit articles reporting original week of interest to NACE diversementsorbin Papers tunging from Hespitals in applied topics are welcome. Prospective atthens are encouraged to submid manuscripts to the Edition of the Chargerian of the NACHS Editorial Board Papers may blue by solicited from presenters at the annual morning and from other segmes. Papers should be propered entitudes by for publication in CP, with no many parties. proviously published elsewhere All commissions will be reviewed. by the Editional Board, where mimbers will advise the follow as to whether a manuscript is approprint-le publication. Final publication decisions real with the Editor, who reserves the right to marke californial changes to equipclarity and community of myle.

REVIEWS

Book reviews, map tensors, and surpring software reviews are switcene. The Editor will select tensors for attribute received from publishers. Prospective reviewes of allowing this contact the Editor directly.

FUGITIVE CARTUGRAPHIC LITERATURE

Information of interest to map makers. Demissions and educations appears in diverse publications. We invite symptom of rections, news, and papers to and in outless not among appears to any the analysis, or prography, map the analysis, or prography.

TECHNICAL GUIDILINES FOR SUBMISSION

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Literature cated should conform to the Chicago Manual of Style.

13th ed., University of Chicago Press, Chapter In. style "E".

Examples of the correct clintion from appear in the leating articles of this inner.

Submission may be sept to.

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The North American Cartographic Information Society (NACIS) was founded in 1980 in response to the need for a multidisciplinary organization to facilitate communication in the map information community. Principal objectives of NACIS are:

§ to promote communication, coordination, and cooperation among the producers, disseminators, curators, and users of cartographic information;

§ to support and coordinate activities with other professional organizations and institutions involved with cartographic information;

§ to improve the use of cartographic materials through education and to promote graphicacy;

§ to promote and coordinate the acquisition, preservation, and automated retrieval of all types of cartographic material;

§ to influence government policy on cartographic information.

NACIS is a professional society open to specialists from private, academic, and government organizations throughout North America. The society provides an opportunity for Map Makers, Map Keepers, Map Users, Map Educators, and Map Distributors to exchange ideas, coordinate activities, and improve map materials and map use. Cartographic Perspectives, the organization's Bulletin, provides a mechanism to facilitate timely dissemination of cartographic information to this diverse constituency. It includes solicited feature articles, synopses of articles appearing in obscure or non-cartographic publications, software reviews, news features, reports (conferences, map exhibits, new map series, government policy, new degree programs, etc.), and listings of published maps and atlases, new computer software, and software reviews.

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