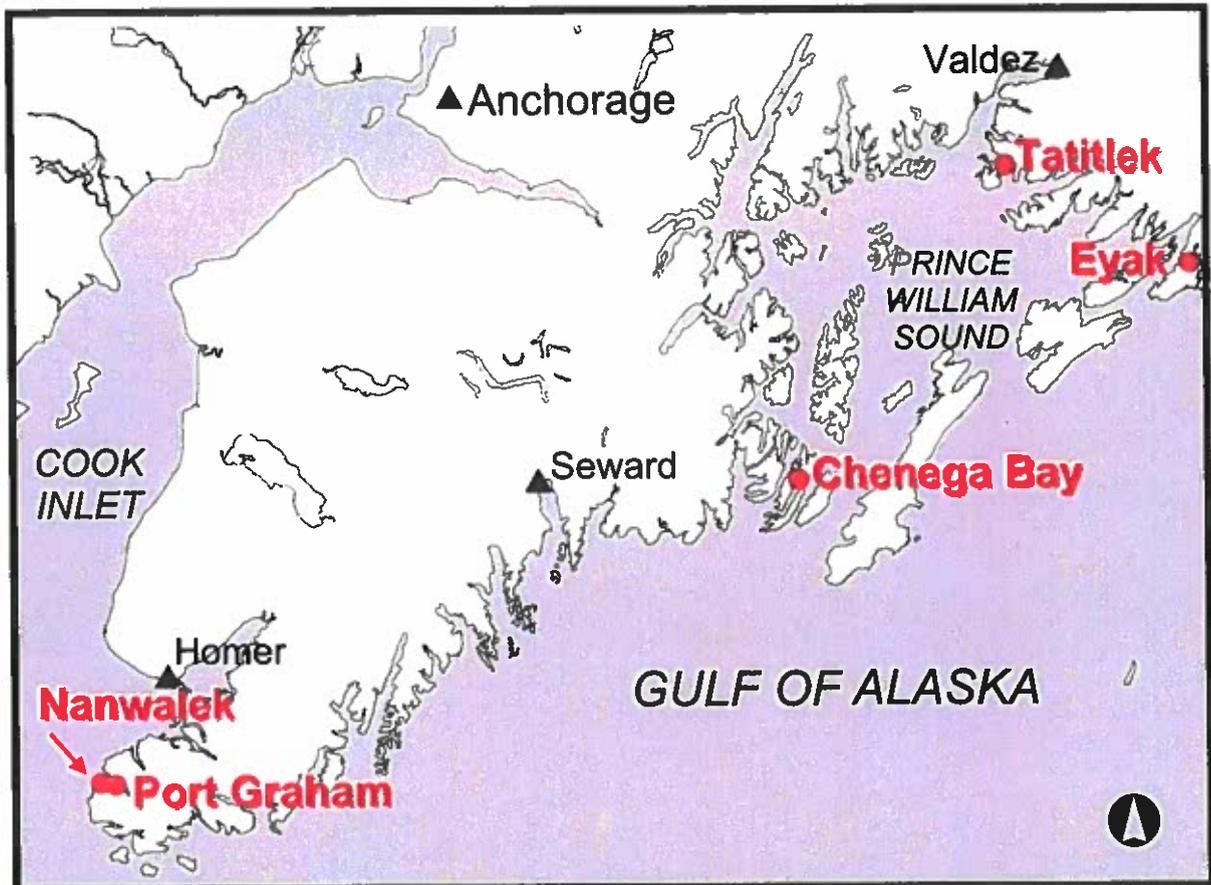# Chugachmiut GIS (Geographic Information System) Needs Analysis

Final Report

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Introduction

This report summarizes the GIS needs analysis conducted for Chugachmiut and Chugach Regional Resources Commission (CRRC). The geographic scope covered by the analysis includes the five traditional villages in the region: Nanwalek, Port Graham, Chenega Bay, Tatitlek, and Native Village of Eyak.

While it is only about 250 miles across the Chugachmiut region, in between and around the edges there are many different influences, environments, and issues as well as similarities. One of the unifying events was the 1989 grounding of the Exxon Valdez—only a few miles from Tatitlek. It is ironic that villages that were farther away from the horrendous oil spill had greater environmental impacts than Tatitlek did, although Tatitlek was changed by other factors associated with the spill. Another event that affected the entire area was the 1964 Good Friday earthquake, which capriciously uplifted some areas while adjacent lands subsided. The original Native Village of Chenega was destroyed from a subsequent tsunami which killed one-third of the population, and the village is now re-established on Evans Island. The Native Village of Eyak is blended into the environs of Cordova, whereas the other villages are distinct entities. Access to the villages varies as well. Regular scheduled air service is available to Eyak tribal members; however the other villages are dependent upon air taxi, boat, and in some cases the Alaska State Marine Ferry. All five villages are off the "road system".

The Project

In early January 2005, Cherie Northon and Thom Eley met with Charlie Sink and Christine Celantano (via phone conference) to gain an initial understanding of the project and the Chugachmiut region. Christine suggested that Thom and Cherie meet with Patty Schwalenberg of CRRC for additional information, and this took place on January 21, 2005. A preliminary outline of the needs survey was developed, and Charlie, Cherie, Thom, and Christine (via phone conference) discussed it in late February. A decision was made to develop a general survey for eliciting information from the residents, and then a specialized survey to identify the technical infrastructure of each village was created to present to one or two individuals in the village who were familiar with items such as hardware, software, Internet access, etc.

Travel out to the villages was delayed due to several situations, but mainly weather and participants' schedules. It was critical to have Christine and Charlie available for the village visits as a liaison between Chugachmiut, CRRC, and Mapping Solutions. The unenviable task of scheduling all the necessary participants was left to Christine, who did a remarkable job, and we extend our thanks to her. She and Charlie arranged transportation and other logistics, which resulted in an economical use of time and money as far as Mapping Solutions can evaluate. All village visits were accomplished

between May 18 and August 25, 2005. We are still not sure how they were able to arrange the gorgeous weather that greeted us on each visit!

At each venue a PowerPoint presentation and a demonstration of ArcGIS were made by Cherie and Thom to those attending the meeting. Afterwards, the participants were asked to fill out either the general and/or the technical information surveys. In some cases the surveys were picked up at the meeting, in other cases they were mailed back to Mapping Solutions.

Part way through the project, Cherie made a project overview presentation to several village chiefs who were assembled at CRRC in Anchorage in July. The goal of this was to enumerate the value of a regional GIS—finding similar issues that might be better tackled by the group as a whole. Furthermore, it was hoped that this type of collaboration might facilitate communication between Chugachmiut members.

Village Visits

All five villages were visited, and meetings were held with interested residents and village leaders as well as Charlie Sink, Christine Celantano, Cherie Northon, and Thom Eley. The five villages were visited as follows:

1. Port Graham, May 18, 2005

2. Nanwalek, May 19, 2005

3. Tatitlek, June 24, 2005

4. Native Village of Eyak, August 24, 2005

5. Chenega Bay, August 25, 2005

Detailed reports for each of the five villages are attached as appendices to this report. These reports talk about specific ideas, issues, and recommendations related to GIS for each village. Residents were generally familiar with GIS, and they quickly visualized uses for GIS within their village. A couple of the villages produced impressive lists of ideas for GIS uses, users, and data sources. Several individuals had even taken GIS training, although their skills are rusty, and these folks had the GIS software and computers that appear to be able to run the program. All the villages were positive about GIS, yet all five villages expressed valid trepidations. These concerns are summarized as follows in the level of importance to village residents—in our perception— who met with us:

1. How will GIS be funded—startup and sustaining?
2. Who will be the GIS person?
3. How will people be trained and how will enhancement of skills be accomplished?
4. Where can they get help if they have a problem with GIS?

5. How can data access to datasets be regulated?
6. How can they acquire computers to handle the GIS program and obtain GIS software.
7. How will GIS fit into village administrative hierarchy?

If these perceived impediments can be overcome in the eyes of the villagers, we think that they would like to become involved in GIS. We have discussed some strategies for overcoming these impediments in the Region-Wide Recommendations.

Region-Wide Recommendations

Based on our assessment of Chugachmiut, CRRC, and the five villages, Mapping Solutions is pleased to make the following recommendation and/or general comments concerning the adoption of a region-wide yet village-based GIS program:

1. Geographic Information Systems (GIS) has become standard technology for the management of natural and human systems, and it is utilized by tribes, Native Corporations, State and Federal agencies, private business, NGO's, and a number of other organizations.

2. A GIS is now an essential tool of cultural survival and economic development, and without the development of GIS capabilities, villages are limiting the opportunities available to them for self-determination.

3. Chugachmiut and CRRC understand the value of GIS and utilizing GIS software to accomplish their missions. Further, CRRC and Chugachmiut would like to see the increased usage of GIS within their entities and amongst the villages.

4. Chugachmiut and CRRC would like to empower villages to develop their own GIS capabilities for economic, social, and resource development and to share resources and ideas on a local, regional, national, and international level for the mutual benefit of all Native residents.

5. The development of GIS skills in villages involves local people and local knowledge in dealing with local issues.

6. GIS maps signify what is happening within communities and lands, are symbols and instruments of power, and are tools for control.

7. GIS maps can be used to rename, reclaim, manage, and plan for the use of lands and resources.

8. Further, other sophisticated technology such as Global Position Systems (GPS), aerial photography, and satellite imagery can be combined within and enhance the power of the GIS.

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9. Mapping Solutions was able to assess the level of knowledge, interest, skill, and technical capabilities as well as relevant issues in five of the Chugachmiut tribes: Nanwalek, Port Graham, Chenega Bay, Tatitlek, and Native Village of Eyak.

10. All villages were interested in developing a level of GIS capability, and the five villages came up with a diverse inventory of potential uses and benefits of GIS as well as an outstanding list of data sources as well as individuals in or associated with their community who could work with the GIS.

11. Even so, the villagers were concerned with how GIS would be funded, supported, personnel trained, hardware and software acquired, and where GIS would fit in the village administrative hierarchy. These are legitimate (although not insurmountable) concerns for any entity beginning a GIS program, but most of the issues could be easily worked through with some mentoring from Chugachmiut, CRRC, or Mapping Solutions personnel and some minimal additional funding. Furthermore, Chugachmiut, CRRC, or Mapping Solutions staff could help the village write an initial grant to support GIS and then encourage the villages to write GIS into all grant proposals to help continue to fund GIS endeavors.

12. We recommend that a Region-wide training program be conducted for all GIS users, even those who have had some training. This training would be conducted in Anchorage by an organization such as Mapping Solutions, which has had experience working with tribes on GIS projects and issues. This training would incorporate datasets from Alaska and expressly from the Chugachmiut region whenever possible, and the training would focus specifically on those skills that the village GIS specialist would need to get their village program underway. This would give all individuals experience with datasets that they will actually use in their village programs. Often times commercial GIS training programs use datasets from outside of Alaska, such as ATM locations in Atlanta, Georgia, which have no relevance to the needs of village Alaskans. Additionally, the training would introduce the village GIS specialist to four important topics:

   o The diverse ways that GIS could be applied to issues, problems, or questions within the villages. GIS has many uses beyond natural resources and general planning, but these issues are rarely pointed out to beginning users.

   o The course would cover the importance and establishment of GIS standards for measurements and data collection that would apply on a Region-wide basis, which allows for accurately collecting and easily sharing data with others.

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o Application of GPS to village data collection and incorporating GPS data into the GIS database—there are some pitfalls here and the village GIS specialists would learn to avoid these.

o Considerable attention would be given to GIS mapping issues specific to Alaska Native villages, such as subsistence and local knowledge mapping, security and sharing of sensitive data, and how young people can be incorporated into GIS mapping and data collection projects.

13. Following the training, a Mapping Solutions staff person or other trainer should go to each of the villages and help the village GIS specialist set up the software and datasets on his or her computer so that the configuration and organization are uniform throughout the region. This uniformity would assist in troubleshooting when the need arises. The trainer and village GIS specialist can assure that everything is operational and all datasets and other information can be located. This will keep people from running into frustrating problems, albeit simple ones, that can hinder the process of becoming operational.

14. Further, when the village has a specific project waiting the application of GIS, the trainer could help the village GIS specialist get started on this task. Often times the first steps into a project are the most difficult, so some mentoring by the trainer would assure a smooth launch of the villages' GIS programs.

15. A region-wide GIS position should be established in Chugachmiut, and this position would function to produce GIS products for the corporation, oversee GIS data storage in the Corporation's blade server, which would be made available to villages to assist in their data storage and security, acquire and provide datasets that would be of help to the villages and CRRC, and function as a GIS mentor for the village GIS specialist. As a GIS mentor, this individual could help village specialists with troubleshooting of GIS programs, provide advice on GIS issues and formulate and cooperate on specific GIS projects of region-wide interest and importance. Additionally, the region-wide GIS person would assure that the GIS standards are established and adhered to by all persons gathering GIS data for the villages and Corporation. Finally, this region-wide GIS specialist could arrange:
o annual or biannual training workshops where all GIS specialists get together on a regular basis to enhance their GIS skills and deal with issues of mutual interest.
o training for new GIS specialists when new people become involved in the GIS program.

16. Coordinate GIS software purchases so that every village is on ArcGIS 9 or the latest version of ESRI software and the software is obtained at the lowest possible cost.

17. Those villages interested in introducing GIS technology, data gathering, and related skills into their high school curriculum could come together and develop a curriculum that could be shared. This would prevent duplication of effort and materials.

CONCLUSIONS

The time is right to institute a region-wide GIS that includes the five villages. All villages should actively participate in a region-wide GIS once their concerns are alleviated. The key to success will be mentoring of the villages and their GIS personnel. This mentoring should begin at the outset and continue in some structured way over the years.

- The tribes should be helped to garner the funds for the initial startup, including hardware and software purchase, and technician salary, and determine the placement of GIS within the village organizational structure.

- Region-wide GIS training and workshops that would include all persons within the Corporation, CRRC, and villages who will be using GIS need to be held. This training should be conducted by an organization such as Mapping Solutions, who uses Alaska data, and the training datasets should include, in part, those that will be used by village GIS technicians.

- Uniform software, i.e. ArcGIS 9x, should be obtained for all villages and this should be loaded onto the village computer(s) by a Chugachmiut IT administrator to assure that the software works with the Chugachmiut system. Occasionally conflicts exist between the way a system is setup, and the operation of ArcGIS software. These inconsistencies often require the coordination of ESRI personnel for the ArcGIS software and a local system administrator.

- The training should be immediately followed by site visits from the course instructors who will help set up the already-installed software and datasets according to a region- and corporation-wide protocol. At least initially, all computers will be set up and organized the same way. Further, on-site mentoring would assure that the village GIS technician was up and running smoothly.

- Establish a regional Chugachmiut GIS technician position. In addition to doing general GIS work for Chugachmiut, this person should function as the mentor for the village GIS technicians, collector and distributor of datasets, and maintain the secure data blade servers in the Chugachmiut office.

- There is an abundance of free data available that we have found (included on CD's in the back of this report), and Chugachmiut has data as well. What needs to happen is to conduct an inventory of all the data available, update

the inventory that Mapping Solutions gathered several months ago, and prepare a protocol for organizing it in a manner that best suits the needs of Chugachmiut as a region and for its tribes.

- Develop a series of "demonstration projects" to show other Chugachmiut villages how GIS could be incorporated within the village planning and management as the villagers already have ideas on the utility of GIS to their lands and resources. A couple examples of success with GIS by a village would be positive encouragement to the other villages. Several villages have projects that they could start on almost immediately:

  o Eyak has its village roads and trails mapping inventory—a requirement of BIA—that is now being done by hand, which is very time consumingly. The only things necessary to complete this project would be an inexpensive ($150-300) GPS, and some mentoring on how to get organized and started. Training in GPS should be part of the region-wide GIS course.

  o Nanwalek has several projects that could be accomplished with minimal start up costs. The residents were particularly interested in mapping fuel and propane tanks and cemetery burials within the village. Again, the only things necessary to complete this project would be an inexpensive ($150-300) GPS, and some mentoring on how to get organized and started. As noted in the Nanwalek village report, residents have other ideas for mapping projects, but these would probably entail the writing of a grant for support.

  o Chenega Bay residents expressed an interest in a shoreline monitoring program that searched for residual oil 17+ years after the *Exxon Valdez* spill. This survey would resurvey important beaches examined just after the spill and would look at those beaches where "no oil was noted" and no survey was conducted. This project would incorporate GIS and GPS and would be an excellent demonstration project, but would require some grant money for funding and to work with an organization such as Mapping Solutions to help get the endeavor started.

- Chugachmiut and CRRC should encourage the villages to include GIS costs in grant proposals as this is an easy way to pay GIS's way. Someone needs to monitor grant and other opportunities that would have a GIS component and encourage the villages to submit proposals.

In closing, we would like to make a few comments based on our visits to the villages. First, each tribe is located in an exceptionally beautiful setting, and we are exceedingly glad to have had the opportunity to travel and see the villages. The people we met were gracious, friendly, welcoming, and caring. It is clear that residents care about and

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are concerned with their villages in terms of the past, the present, and the future. Documentation of cultural history, planning for new development, and providing a healthy and sustainable environment are important to all of them. Bridging the generations from elders to youth was often mentioned, and this somewhat parallels the idea of melding new technical tools with traditional systems of knowledge. They can come together, and everyone benefits in the end. And, the use of educational curriculum is a good place to begin as tribes look to the future of their young people.

Regarding the implementation and standardization of a Chugachmiut cooperative GIS, one of the first things that is important is the level of sophistication and experience in GIS that we found during our GIS needs analysis. One or more people in every village had worked in GIS, been trained in GIS, or had heard about it. Furthermore, people with and without a background in GIS see it as a beneficial tool. It does not seem that there will be any resistance in developing new or enhancing existing systems. Each village had fairly modern computer systems, though a few were lacking in some of the peripheral equipment that compliments a GIS, i.e. a scanner, GPS, and digital camera. None of these pieces of equipment is overly expensive, and all together the three items could probably be purchased for no more than $500-700.

GIS software was quite prevalent, due in part, to BIA facilitation in purchasing. Nanwalek appears to be the only village without the software, although it is still unclear whether or not Tatitlek has it. It would be necessary to get all onboard with ArcGIS 9. The basic components and desire are there, Chugachmiut is a lot farther along than many entities in adopting a region-wide and as well as compatible local GIS systems. We believe that following the steps outlined in this report will ease Chugachmiut's transition into a GIS-ready community.

APPENDICES

APPENDIX 1
Compiled Chugachmiut General GIS Survey Responses

1. Did you have any familiarity with GIS mapping before the presentation?

	Yes	No
Port Graham	8	2
Nanwalek	5	6
Tatitlek	2	1
Native Village of Eyak	1	0
Chenega Bay	2	0

If yes, what was it? How were you exposed to GIS mapping?

Port Graham	Village corp, wetlands/watershed project, training, natural resources program
Nanwalek	Training, Nanwalek IRA council had one (GIS?) produced around 1990
Tatitlek	GIS class, oil spill drill
Native Village of Eyak	2-day training
Chenega Bay	Limited exposure, no explanation provided

2. After hearing the presentation, do you think GIS mapping can benefit your village specifically? How?

	Yes	No	N/A	
Port Graham	6	0	2	See following for comments
Nanwalek	11	0	0	See following for comments
Tatitlek	3	0	0	See following for comments
Native Village of Eyak	1	0	0	See following for comments
Chenega Bay	2	0	0	See following for comments

3. On a regional scale, do you think GIS or other mapping can benefit your village as it interacts with other Chugachmiut villages, non-Chugachmiut villages, and governmental agencies ?

	Yes	No	N/A	
Port Graham	7		1	See following for comments
Nanwalek	7		4	See following for comments
Tatitlek	3	0		
Native Village of Eyak		1		See following for comments
Chenega Bay	2			See following for comments

4. What other uses do you think GIS mapping might have in the village, such as in the school or classroom?

Port Graham	See following for comments
Nanwalek	See following for comments
Tatitlek	Yes to familiarize youth with traditional use
Native Village of Eyak	None currently in school, so potential there
Chenega Bay	See following for comments

5. What mapping information do you think would be helpful for management and advancement of your village GIS or set of maps?
   - Natural resources (land and sea)
   - Cultural resources
   - Environmental issues
   - Village planning
   - Infrastructure (roads, trails, sewage, water, etc.)
   - Education (classroom)

Port Graham	See following for comments
Nanwalek	See following for comments
Tatitlek	See following for comments (all of the above)
Native Village of Eyak	See following for comments
Chenega Bay	See following for comments

5a. How do you think this information could or should be collected?

Port Graham	See following for comments
Nanwalek	See following for comments
Tatitlek	Interviews, existing data, carefully
Native Village of Eyak	Local tribal members
Chenega Bay	See following for comments

6. Do you have any comments or other ideas that you think would be helpful in analyzing the benefit of a GIS to your village and the other Chugachmiut villages?

Port Graham	See following for comments
Nanwalek	See following for comments
Tatitlek	No
Native Village of Eyak	See following for comments
Chenega Bay	See following for comments

Port Graham Survey Results for GIS Usages (n=10)

- Community expansion/planning
    - Future roads
    - Future housing
    - Future land fill
    - City planning
    - Lots and property boundaries

- Environmental
    - Garbage/land fill

- Community resources
    - Traditional harvest areas
    - Areas for hunting, food gathering locations
    - Hatchery for planning
    - Traditional resource management

- Environment
    - Wetlands
    - Port Graham/Nanwalek Watershed
    - Clean water
    - Natural resource usage via monitoring
    - Document change
    - Forestry

- Cultural—nothing specific

- Infrastructure
    - Maintenance of water/sewer lines
    - Building roads and existing road system
    - Sewage and water lines
    - Fire planning
    - Tsunami planning

- Educational benefits:
    - Teaching kids
    - Job potential/educational pursuit for youth
    - Cultural display facility

- Information sources:
    - Elders
    - Youth
    - General community
    - Locals!!!
    - Parents

Nanwalek Survey Results for GIS Usages (n=11)

- Community expansion
    - Available land
    - Water supply
    - Future land fill/sludge lagoon
    - Document village growth—past and future
    - Future school location
    - Population changes (+ and -)
    - Future airport, harbor, businesses
    - Lots and property boundaries
        - Native allotments

- Environmental
    - Contamination
        - Fuel storage tank/propane storage near school
            - Change to oil or electricity as a safety concern
            - Diesel spill discharge
        - Sewage
        - Garbage/land fill
            - Leaching
            - Amounts
        - Sludge lagoon

- Weather patterns
    - Patterns
    - Changes: measure snow and rain

- Community resources
    - Traditional gathering areas
    - Usage areas, council areas, respect boundaries
    - Preserving land

- Environment
    - Salmon runs/returns
    - Fish migration
    - Wildlife
        - Changes
        - Migrations
        - Protection of species
    - Rivers
    - Reef
    - Shoreline, lagoon, sandbar changes
    - Beach
        - Runoff
    - Kelp movement

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- o Wetlands
- o Land use/change
- o Erosion, erosion control of hill and runway areas
- o Plants
  - ▪ Those used for medicinal purposes
  - ▪ Wild flower areas

- Cultural
  - o Family roots
  - o Burial sites
  - o Traditional place names
  - o Language preservation
  - o Traditional knowledge
  - o History

- Infrastructure
  - o Old Alaska Commercial Company trail
  - o Sewage and water lines
  - o Airport/landing strip
  - o Breakwater

Educational benefits:
- Bring GIS and info into the classroom
- Hire an intern from high school
- Provide the elders with information and training
- Help kids with village history
- Job potential
- New museum
- For outsiders to get information
- Curriculum

Information sources:
- Elders
- Youth
- General community
- Locals!!!
- Keep calendars of information

Eyak Survey Results for GIS Usages (n=1)

- Community expansion
  - Lots and property boundaries
    - Native allotments—400 sites need to be surveyed once a road is put in for access

- Environmental
  - Contamination
    - Old generator near Eyak Lake
  - Delta changes due to climate change

- Community resources
  - Hunting areas
  - Fishing areas
  - Berry picking areas

- Natural resources
  - Sea otter count
  - Sea lion rookeries
  - Fisheries-tagging

- Cultural
  - Historical sites
  - Graveyard, old cemetery

- Infrastructure
  - Roads and trails (Joe Kompkoff's current project)

Educational benefits:
- Bring GIS and info into the classroom because there is none now
- The more technology imposed on children, the better

Information sources:
- People mark trails with GPS and Joe Kompkoff can return and slug trail them

Chenega Bay Survey Results for GIS Usage (n=2)

- Natural resources:
  - Fish streams
  - Subsistence gathering areas

- Cultural resources:
  - Camp sites
  - Grave sites
  - Other

- Environmental issues:
  - Contamination sites/old pollution sources
  - Watershed mapping

- Village planning:
  - Roads
  - Buildings
  - Housing
  - Infrastructure (roads, trails, sewage, water, etc.)

- Education benefits
  - Mapping, etc. already used in the school
  - Expand to GIS via Kate McLaughlin's Environmental Ed class curriculum
  - Have youth be data gatherers
  - This would instill a sense of ownership in the community

Other comments:

They see the value of documenting baseline data in Chenega Bay.

Tatitlek Survey Results for GIS Usage (n=3)

- Natural resources:
  - yes

- Cultural resources:
  - yes
- Environmental issues:
  - yes

- Village planning:
  - Yes

- Infrastructure
  - Yes

- Education benefits:
  - Familiarize youth with area and traditional use
  -

Other comments:
  Make information available for general use

Data need to be collected carefully
Do interviews and look at existing state and federal data

Combined Chugachmiut GIS Infrastructure

A. Infrastructure for a GIS:

1. Is there an administrative entity or unit that can accommodate a GIS (computer/peripherals and office space)?

Port Graham	Port Graham Village Council
Nanwalek	Possibly the Environmental Program, Natural Resources Fisheries Board
Tatitlek	unknown
Native Village of Eyak	Perhaps the Native Village of Eyak offices
Chenega Bay	Environmental Office

b. If not, what options are there for location of a GIS?

Port Graham	N/A
Nanwalek	N/A
Tatitlek	unknown
Native Village of Eyak	N/A
Chenega Bay	N/A

2. Is there a computer currently available to house a GIS? If so, can it be a dedicated unit with minimal other usages?

Port Graham	Yes/No
Nanwalek	N/A
Tatitlek	unknown
Native Village of Eyak	Yes
Chenega Bay	No

b. What is its capacity?

	RAM	Speed (GHz)	Internal storage capacity
Port Graham	1GB	2.6	40GB
Nanwalek	N/A	N/A	N/A
Tatilek	unknown		
Native Village of Eyak	256MB		20GB
Chenega Bay	248MB	2.4	N/A

c. Peripherals available?

	Ext HD	Printer	Scanner
Port Graham	N/A	HP Photosmart 7660	N/A
Nanwalek	N/A	N/A	N/A
Tatilek	unknown		

Native Village of Eyak	No	N/A	N/A
Chenega Bay	N/A	HP Desk Jet 970 lxi	HP Scanjet 5100C

c. What operating system is used?

Port Graham	Windows 2000
Nanwalek	Windows ?
Tatitlek	unknown
Native Village of Eyak	XP
Chenega Bay	XP Professional

d. Is there a GPS available? If so, what is the make, model, and age?

Port Graham	Yes	Garmin Geko 101, 2001
Nanwalek	No	N/A
Tatitlek	unknown	
Native Village of Eyak	No	Some groups (Firewise and Environmental office) have them but won't lend them out
Chenega Bay	Yes	N/A

e. Is there a digital camera available? If so, what is the make, model, and age?

Port Graham	Yes	Kodak DC 3400, 1999
Nanwalek	Yes	N/A
Tatitlek	unknown	
Native Village of Eyak	No	
Chenega Bay	Yes	N/A

3. Is there Internet access available to the village? If so, type/speed?

Port Graham	Yes	DSL, 300kb download, 56k upload
Nanwalek	Yes	N/A
Tatitlek	unknown	
Native Village of Eyak	Yes	Cable
Chenega Bay	Yes	GCI Satellite

4. What types of software are currently available?

	Excel	Access	Other	GIS
Port Graham	Y	Y	MS Word	Arcview 3x, ArcGIS 8.0
Nanwalek	Y	N/A	N/A	No
Tatilek	unknown			
Native Village of Eyak	Y	No		ArcGIS 9.1
Chenega Bay	Y	Y	N/A	No

5. Are there any people with GIS training currently in the village?

	Currently Trained	#	Software
Port Graham	Y	2	ArcView 3x, ArcGIS 8.0, MapInfo?
Nanwalek	N		
Tatilek	unknown		
Native Village of Eyak	Yes		2-day training, hasn't used it
Chenega Bay	No		

b. Are these people able to commit to additional training (if necessary) in order to manage the village GIS?

	Additional Training	#	
Port Graham	Yes	2	
Nanwalek	N/A		
Tatilek	unknown		
Native Village of Eyak	Yes	1	If paid for (including expenses), needs someone to come and set up the system on site
Chenega Bay	Yes		

c. If there is not a person with GIS experience, is there a person or persons able to commit time to learn how to run and manage a GIS?

Port Graham	N/A
Nanwalek	N/A
Tatitlek	unknown
Native Village of Eyak	N/A
Chenega Bay	Yes

d. How much time can the GIS person(s) commit on a weekly basis?

Port Graham	As much as needed
Nanwalek	N/A
Tatitlek	unknown
Native Village of Eyak	N/A
Chenega Bay	As much as needed

e. Where will the funds come from to pay them?

Port Graham	Possibly from ANA grant or IGAP
Nanwalek	Will need to look for funding
Tatitlek	unknown
Native Village of Eyak	No idea—that is the problem
Chenega Bay	Possibly EPA/IGAP project for 2007/08

f. Are these funds ongoing or will they have to be requested annually or on some other time frame?

Port Graham	Need to be requested annually
Nanwalek	N/A
Tatitlek	unknown
Native Village of Eyak	The big question
Chenega Bay	Need to be requested annually

g. If an investment is made for personnel, are they committed long-term to the village?

Port Graham	Yes
Nanwalek	N/A
Tatitlek	unknown
Native Village of Eyak	Perhaps
Chenega Bay	Yes

h. Are there some young people, e.g. high school age, who would be interested in learning GIS and assisting the GIS manager?

Port Graham	Possibly
Nanwalek	Possibly high school students, community members
Tatitlek	unknown
Native Village of Eyak	Not sure, possibly
Chenega Bay	Yes

B. Data acquisition:
1. Who are candidates for data gathering?
a. Are there any people with GPS experience?

Port Graham	Yes
Nanwalek	Yes
Tatitlek	unknown
Native Village of Eyak	Yes
Chenega Bay	Yes

Chenega Bay: Mike Angaiak, Kate McLaughlin, Chenega Bay School
b. Are there any people with experience in aerial photography or satellite imagery?

Port Graham	No
Nanwalek	No
Tatitlek	unknown
Native Village of Eyak	Somewhat
Chenega Bay	No

c. Are there any people with survey experience?

Port Graham	No
Nanwalek	Yes, several people have done local surveys
Tatitlek	unknown
Native Village of Eyak	No, but surveying needs to be done on allotments
Chenega Bay	No

d. Are there any people who regularly use various types of maps:

	USGS topo	Aviation	Nautical	Other
Port Graham	No	No	No	N/A
Nanwalek	No	No	No	N/A
Tatitlek	Unknown	Unknown	Unknown	unknown
Native Village of Eyak	Yes	N/A	Yes	N/A
Chenega Bay	Yes	No	Yes	N/A

C. GIS and other data for managing the village

1. What information do you think would be helpful for management of the village?

Port Graham	See comments above
Nanwalek	See comments above
Tatitlek	unknown
Native Village of Eyak	See comments above
Chenega Bay	See comments above

2. Are you aware of any data sources that exist for the village area? These can be digital data (geospatial data, spreadsheet data, i.e. Excel or Access), or maps and photos.

Port Graham	Yes
Nanwalek	Check with Chief Emilie Swenning
Tatitlek	unknown
Native Village of Eyak	No
Chenega Bay	Environmental Program Office, Council Office

Please identify any data sources that you know about and where they are located.

Port Graham	Data created from EPA Wetlands grant, in Village Corp office
Nanwalek	NPHRA—Olen Harris and Larry Hoyer
Tatitlek	unknown
Native Village of Eyak	N/A
Chenega Bay	N/A

3. What data are sensitive and need to be kept confidential?

Port Graham	Location of traditional harvest areas
Nanwalek	Personal Info
Tatitlek	unknown
Native Village of Eyak	Hunting/gathering areas
Chenega Bay	Historical sites/grave sites, subsistence areas

Can these data be shared among all the village members?

Port Graham	No
Nanwalek	Local and approved people/organizations
Tatitlek	unknown
Native Village of Eyak	Maybe if it proves beneficial
Chenega Bay	Yes

Do you think these data are necessary for the village GIS? If yes, what suggestions do you have for keeping them confidential?

Port Graham	Yes	No suggestions provided on how to keep confidential
Nanwalek	N/A	N/A
Tatitlek	unknown	
Native Village of Eyak	Yes	N/A
Chenega Bay	Yes	Password protected for access

4. Are there data that you are comfortable sharing with other villages or agencies in the Chugachmiut region?

Port Graham	N/A
Nanwalek	N/A
Tatitlek	unknown
Native Village of Eyak	Perhaps some with the Forest Service and Fish & Game
Chenega Bay	Yes, environmental issues data

APPENDIX 2
INDIVIDUAL VILLAGE REPORTS

Chugachmiut GIS (Geographic Information System) Needs Analysis Village Report

Chenega Bay

Mapping Solutions
P.O. Box 230329
Anchorage, Alaska   99523
(907) 561-4627

February 19, 2006

INTRODUCTION

In November 2004, Chugachmiut and Chugach Regional Resources Commission (CRRC) contracted with Mapping Solutions (Dr. Cherie Northon and Dr. Thom Eley) to conduct a GIS needs analysis of their region.   Chugachmiut and CRRC want to empower villages to develop their own GIS and GPS capabilities for economic, social, and resource development and to share resources and ideas on a regional level for the mutual benefit of all Native residents. Mapping Solutions' role was to assess the level of knowledge, interest, skill, and technical capabilities as well as relevant issues in five of the Chugachmiut tribes: Nanwalek, Port Graham, Chenega Bay, Tatitlek, and Native Village of Eyak.

During Spring and Summer 2005, Drs. Northon and Eley (Mapping Solutions), Charlie Sink (Chugachmiut), and Christine Celantano (CRRC) visited the five villages, talked about GIS, its capabilities and the interest and experience of tribal members in using GIS to assist their village, and conducted a GIS needs analysis survey utilizing two questionnaires. One survey was general to elicit ideas about the use of GIS from a broad audience, the other was geared at getting information about the technical capabilities.

CHENEGA BAY VISIT

This report summarizes the assessment for the Chenega Bay, which was accomplished during our visit on August 25, 2005.   Present at the Chenega Bay meeting were: Larry Evanoff, Pete Kompkoff, Richard Kompkoff, and Kate McLaughlin as well as Charlie Sink, Christine Celantano, Cherie Northon, and Thom Eley.

CHENEGA BAY COMMENTS

After the presentation a good discussion was had that identified a lot of interest and potential in GIS, although there is currently no one in the village with GIS training. Several people expressed great interest in incorporating GIS and data gathering into the school curriculum, such as the environmental science class that Kate teaches at the Chenega Bay School. Some residents have had some valuable experience in monitoring the shoreline oiling after the Exxon Valdez spill, and it seems that with some training and proper equipment (mainly a GPS unit), they could do a follow-up to help evaluate what remains 17+ years later.

Uses for a GIS in Chenega mirror some of the other villages that are building and expanding. Utility infrastructure, planning, parcel boundaries, and roads would be important to include. Since Chenega Bay has only been in its present location for about 21 years, a baseline for evaluating its master plan and expansion would be very valuable. Further, there are environmental concerns that could be looked at possibly before they turn into problems (contamination and pollution sites), and natural resources such as fish streams and subsistence gathering areas could be mapped. Cultural resources of interest include camp sites and grave sites that could be documented.

MAPPING SOLUTIONS REGION-WIDE ASSESSMENT

Based on our assessment of Chugachmiut, CRRC, and the five tribes, Mapping Solutions is pleased to make the following recommendation and/or general comments concerning the adoption of a region-wide yet village-based GIS program:

1. Geographic Information Systems (GIS) has become standard technology for the management of natural and human systems, and it is utilized by tribes, Native Corporations, State and Federal agencies, private business, NGO's, and a number of other organizations.

2. A GIS is now an essential tool of cultural survival and economic development, and without the development of GIS capabilities, villages are limiting the opportunities available to them for self-determination.

3. Chugachmiut and CRRC understand the value of GIS and utilizing GIS software to accomplish their missions. Further, CRRC and Chugachmiut would like to see the increased usage of GIS within their entities and amongst the villages.

4. Chugachmiut and CRRC would like to empower villages to develop their own GIS capabilities for economic, social, and resource development and to share resources and ideas on a local, regional, national, and international level for the mutual benefit of all Native residents.

5. The development of GIS skills in villages involves local people and local knowledge in dealing with local issues.

6. GIS maps signify what is happening within communities and lands, are symbols and instruments of power, and are tools for control.

7. GIS maps can be used to rename, reclaim, manage, and plan for the use of lands and resources.

8. Further, other sophisticated technology such as Global Position Systems (GPS), aerial photography, and satellite imagery can be combined within and enhance the power of the GIS.

9. Mapping Solutions was able to assess the level of knowledge, interest, skill, and technical capabilities as well as relevant issues in five of the Chugachmiut tribes: Nanwalek, Port Graham, Chenega Bay, Tatitlek, and Native Village of Eyak.

10. All villages were interested in developing a level of GIS capability, and the five villages came up with a diverse inventory of potential uses and benefits of GIS as well as an outstanding list of data sources as well as individuals in or associated with their community who could work with the GIS.

11. Even so, the villagers were concerned with how GIS would be funded, supported, personnel trained, hardware and software acquired, and where GIS would fit in the village administrative hierarchy. These are legitimate (although not insurmountable) concerns for any entity beginning a GIS program, but most of the issues could be easily worked through with some mentoring from Chugachmiut, CRRC, or Mapping Solutions personnel and some minimal additional funding. Furthermore, Chugachmiut, CRRC, or Mapping Solutions staff could help the village write an initial grant to support GIS and then encourage the villages to write GIS into all grant proposals to help continue to fund GIS endeavors.

12. We recommend that a Region-wide training program be conducted for all GIS users, even those who have had some training. This training would be conducted in Anchorage by an organization such as Mapping Solutions, which has had experience working with tribes on GIS projects and issues. This training would incorporate datasets from Alaska and expressly from the Chugachmiut region whenever possible, and the training would focus specifically on those skills that the village GIS specialist would need to get their village program underway. This would give all individuals experience with datasets that they will actually use in their village programs. Often times commercial GIS training programs use datasets from outside of Alaska, such as ATM locations in Atlanta, Georgia, which have no relevance to the needs of village Alaskans. Additionally, the training would introduce the village GIS specialist to four important topics:

- The diverse ways that GIS could be applied to issues, problems, or questions within the villages. GIS has many uses beyond natural resources and general planning, but these issues are rarely pointed out to beginning users.

- The course would cover the importance and establishment of GIS standards for measurements and data collection that would apply on a Region-wide basis, which allows for accurately collecting and easily sharing data with others.

- Application of GPS to village data collection and incorporating GPS data into the GIS database—there are some pitfalls here and the village GIS specialists would learn to avoid these.

- Considerable attention would be given to GIS mapping issues specific to Alaska Native villages, such as subsistence and local knowledge mapping, security and sharing of sensitive data, and how young people can be incorporated into GIS mapping and data collection projects.

13. Following the training, a Mapping Solutions staff person or other trainer should go to each of the villages and help the village GIS specialist set up the software

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and datasets on his or her computer so that the configuration and organization are uniform throughout the region. This uniformity would assist in troubleshooting when the need arises. The trainer and village GIS specialist can assure that everything is operational and all datasets and other information can be located. This will keep people from running into frustrating problems, albeit simple ones, that can hinder the process of becoming operational.

14. Further, when the village has a specific project waiting the application of GIS, the trainer could help the village GIS specialist get started on this task. Often times the first steps into a project are the most difficult, so some mentoring by the trainer would assure a smooth launch of the villages' GIS programs.

15. A region-wide GIS position should be established in Chugachmiut, and this position would function to produce GIS products for the corporation, oversee GIS data storage in the Corporation's blade server, which would be made available to villages to assist in their data storage and security, acquire and provide datasets that would be of help to the villages and CRRC, and function as a GIS mentor for the village GIS specialist. As a GIS mentor, this individual could help village specialists with troubleshooting of GIS programs, provide advice on GIS issues and formulate and cooperate on specific GIS projects of region-wide interest and importance. Additionally, the region-wide GIS person would assure that the GIS standards are established and adhered to by all persons gathering GIS data for the villages and Corporation. Finally, this region-wide GIS specialist could arrange:
    a. annual or biannual training workshops where all GIS specialists get together on a regular basis to enhance their GIS skills and deal with issues of mutual interest.
    b. training for new GIS specialists when new people become involved in the GIS program.

MAPPING SOLUTIONS ASSESSMENT OF CHENEGA BAY

1. The residents of Chenega Bay demonstrated a high level of interest for adopting and using GIS, and they identified a number of potential uses of GIS. The villagers' ideas are included as Native Village of Chenega Bay Villagers' Ideas section. Since Chenega Bay is a relatively new community in its present location, the use of GIS for development of village database that would function as a baseline for evaluating its master plan and expansion would be very valuable.

2. Chenega Bay would be an excellent site for a "demonstration project" to show other Chugachmiut villages how GIS could be incorporated within the village planning and management as the villagers already have ideas on the utility of GIS to their lands and resources.

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3. Since some residents were involved in shoreline monitoring for oiling after the Exxon Valdez spill, and a 17+ years later follow up of the shoreline monitoring, incorporating GIS and GPS would be an excellent demonstration project. This would be excellent for a demonstration project, with an organization such as Mapping Solutions helping the village establishing the project.

4. Villagers thought that GIS would fit best in the village's environmental program.

5. GIS software, computer, and associated equipment need to be acquired or assigned for developing a successful GIS program to occur. Again, these seem to be minor problems that the village could work through with some mentoring from Chugachmiut, CRRC, or Mapping Solutions' personnel and some minimal additional funding. Additionally, corporation or CRRC staff could help the village write GIS into grant proposals to help continue to fund GIS endeavors. These activities coupled with a Chugachmiut/CRRC-wide GIS training followed with mentoring in the set up and organization of individual village GIS systems would assist the designated GIS personnel in their actual startup of their program. Currently, no one in the village is trained in GIS. This would help the village from running into problems that can slow or hinder the process of becoming operational.

6. As was the case of other villages, there was great interest in incorporating GIS and data gathering into the school curriculum at the Chenega Bay School, such as the environmental science class.

7. Further, villagers, in the meeting and in individual discussions with us after the meeting, expressed a number of environmental concerns that could be looked at with the GIS before they turn into problems (contamination and pollution sites), and natural resources such as fish streams and subsistence gathering areas could be mapped.

8. Cultural resources of interest to document include camp sites and grave sites that could be documented.

MAPPING SOLUTIONS COMMENTS TO THE VILLAGERS OF CHENEGA BAY

Our report on the ideas and concerns of Chenega Bay about GIS is based on our notes taken during the meeting and the surveys submitted by village residents. If we have not expressed your feelings correctly or clearly enough, or if you have developed different or additional ideas or concerns, please send them to Mapping Solutions so they we can have a complete and correct record of the ideas of the residents of Chenega Bay.

<div align="center">

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</div>

Phone: (907) 561-4627

Last but certainly not least, we would like to thank the residents of Chenega Bay for the help and hospitality you showed us on our visit. We greatly enjoyed visiting your beautiful and friendly village and meeting and talking with you. We look forward to coming back to see you again and spending a longer time.

CHENEGA BAY VILLAGERS' IDEAS
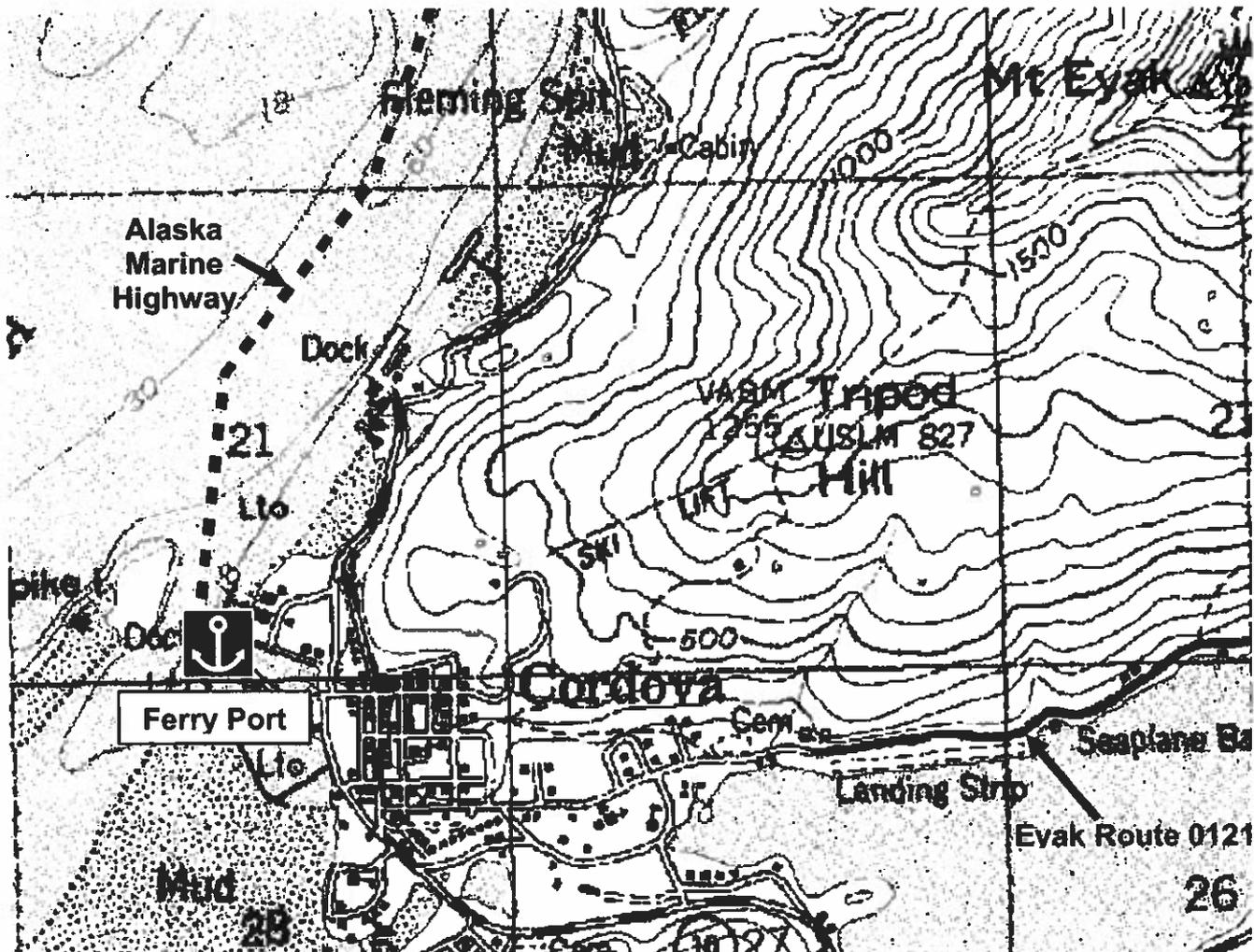### Chenega Bay Survey Results for GIS Usage (n=2)

- Natural resources:
  - Fish streams
  - Subsistence gathering areas

- Cultural resources:
  - Camp sites
  - Grave sites
  - Other

- Environmental issues:
  - Contamination sites/old pollution sources
  - Watershed mapping

- Village planning:
  - Roads
  - Buildings
  - Housing
  - Infrastructure (roads, trails, sewage, water, etc.)

- Education benefits
  - Mapping, etc. already used in the school
  - Expand to GIS via Kate McLaughlin's Environmental Ed class curriculum
  - Have youth be data gatherers
  - This would instill a sense of ownership in the community

Other comments:

They see the value of documenting baseline data in Chenega Bay.

Chugachmiut GIS (Geographic Information System) Needs Analysis Village Report

Native Village of Eyak

Mapping Solutions
P.O. Box 230329
Anchorage, Alaska   99523
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February 19, 2006

INTRODUCTION

In November 2004, Chugachmiut and Chugach Regional Resources Commission (CRRC) contracted with Mapping Solutions (Dr. Cherie Northon and Dr. Thom Eley) to conduct a GIS needs analysis of their region.   Chugachmiut and CRRC want to empower villages to develop their own GIS and GPS capabilities for economic, social, and resource development and to share resources and ideas on a regional level for the mutual benefit of all Native residents. Mapping Solutions' role was to assess the level of knowledge, interest, skill, and technical capabilities as well as relevant issues in five of the Chugachmiut tribes: Nanwalek, Port Graham, Chenega Bay, Tatitlek, and Native Village of Eyak.

During Spring and Summer 2005, Drs. Northon and Eley (Mapping Solutions), Charlie Sink (Chugachmiut), and Christine Celantano (CRRC) visited the five villages, talked about GIS, its capabilities and the interest and experience of tribal members in using GIS to assist their village, and conducted a GIS needs analysis survey utilizing two questionnaires. One survey was general to elicit ideas about the use of GIS from a broad audience, the other was geared at getting information about the technical capabilities.

NATIVE VILLAGE OF EYAK VISIT

This report summarizes the assessment for the Native Village of Eyak, which was accomplished during our visit on August 24, 2005.   Present at the Eyak meeting were: Joe Kompkoff, Thomasina Anderson, Altana Olsen, and Mark as well as Charlie Sink, Christine Celantano, Cherie Northon, and Thom Eley.

NATIVE VILLAGE OF EYAK COMMENTS

Because Eyak is subsumed within Cordova, the Native Village headquarters are in a building on the main street in Cordova. Unfortunately no formal surveys were returned except one regarding the GIS infrastructure, but several detailed discussions occurred between Cherie Northon and a village administrator.

There is a definite frustration within this village regarding a lack of funds for projects. Initially the administrator felt it was a waste of time to even fill out the GIS survey because the time that has been spent in the past filling out forms, surveys, requests, etc. did not result in anything fruitful. Finally Cherie conducted a survey with the administrator over the phone to ascertain some of the issues that hindered the use of a GIS in the village as well as the potential uses of GIS by the village.

The individual, who was already trained in GIS, complained that being handed a set of disks to take back and install after training just didn't cut it. There are a multitude of

34

little things that can frustrate a person using GIS programs—and most of these are never addressed in the "canned" classes that are taught by ESRI and other entities.[1]

The village must produce maps on a yearly basis for BIA documenting roads and trails in the Cordova area, and these are currently hand-drawn and printed out from a set of topographic maps. This project is perfectly suited for GIS, and could be accomplished by the trained GIS person with some updating in training and purchase of an inexpensive GPS unit. The project could be used as an example of how GIS could be introduced into some of the other villages—especially those where people have had some training and initial mentoring.

MAPPING SOLUTIONS REGION-WIDE ASSESSMENT

Based on our assessment of Chugachmiut, CRRC, and the five tribes, Mapping Solutions is pleased to make the following recommendation and/or general comments concerning the adoption of a region-wide yet village-based GIS program:

1. Geographic Information Systems (GIS) has become standard technology for the management of natural and human systems, and it is utilized by tribes, Native Corporations, State and Federal agencies, private business, NGO's, and a number of other organizations.

2. A GIS is now an essential tool of cultural survival and economic development, and without the development of GIS capabilities, villages are limiting the opportunities available to them for self-determination.

3. Chugachmiut and CRRC understand the value of GIS and utilizing GIS software to accomplish their missions. Further, CRRC and Chugachmiut would like to see the increased usage of GIS within their entities and amongst the villages.

4. Chugachmiut and CRRC would like to empower villages to develop their own GIS capabilities for economic, social, and resource development and to share resources and ideas on a local, regional, national, and international level for the mutual benefit of all Native residents.

5. The development of GIS skills in villages involves local people and local knowledge in dealing with local issues.

6. GIS maps signify what is happening within communities and lands, are symbols and instruments of power, and are tools for control.

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[1] An example of one very common error is to make sure that all GIS files are kept in folders that have no spaces in their title and no spaces in the path leading to them. Even putting a file with no spaces in its name on the desktop (i.e. trad_plants) results in spaces in the path because the path to the desktop is usually C:\Documents and Settings\Cherie_Northon\Desktop\trad_plants. Something this simple can entirely stall a project, yet it is rarely, if ever, pointed out in traditional ESRI training courses.

resources and general planning, but these issues are rarely pointed out to beginning users.

- o The course would cover the importance and establishment of GIS standards for measurements and data collection that would apply on a Region-wide basis, which allows for accurately collecting and easily sharing data with others.

- o Application of GPS to village data collection and incorporating GPS data into the GIS database—there are some pitfalls here and the village GIS specialists would learn to avoid these.

- o Considerable attention would be given to GIS mapping issues specific to Alaska Native villages, such as subsistence and local knowledge mapping, security and sharing of sensitive data, and how young people can be incorporated into GIS mapping and data collection projects.

13. Following the training, a Mapping Solutions staff person or other trainer should go to each of the villages and help the village GIS specialist set up the software and datasets on his or her computer so that the configuration and organization are uniform throughout the region. This uniformity would assist in troubleshooting when the need arises. The trainer and village GIS specialist can assure that everything is operational and all datasets and other information can be located. This will keep people from running into frustrating problems, albeit simple ones, that can hinder the process of becoming operational.

14. Further, when the village has a specific project waiting the application of GIS, the trainer could help the village GIS specialist get started on this task. Often times the first steps into a project are the most difficult, so some mentoring by the trainer would assure a smooth launch of the villages' GIS programs.

15. A region-wide GIS position should be established in Chugachmiut, and this position would function to produce GIS products for the corporation, oversee GIS data storage in the Corporation's blade server, which would be made available to villages to assist in their data storage and security, acquire and provide datasets that would be of help to the villages and CRRC, and function as a GIS mentor for the village GIS specialist. As a GIS mentor, this individual could help village specialists with troubleshooting of GIS programs, provide advice on GIS issues and formulate and cooperate on specific GIS projects of region-wide interest and importance. Additionally, the region-wide GIS person would assure that the GIS standards are established and adhered to by all persons gathering GIS data for the villages and Corporation. Finally, this region-wide GIS specialist could arrange:

7. GIS maps can be used to rename, reclaim, manage, and plan for the use of lands and resources.

8. Further, other sophisticated technology such as Global Position Systems (GPS), aerial photography, and satellite imagery can be combined within and enhance the power of the GIS.

9. Mapping Solutions was able to assess the level of knowledge, interest, skill, and technical capabilities as well as relevant issues in five of the Chugachmiut tribes: Nanwalek, Port Graham, Native Village of Chenega, Tatitlek, and Native Village of Eyak.

10. All villages were interested in developing a level of GIS capability, and the five villages came up with a diverse inventory of potential uses and benefits of GIS as well as an outstanding list of data sources as well as individuals in or associated with their community who could work with the GIS.

11. Even so, the villagers were concerned with how GIS would be funded, supported, personnel trained, hardware and software acquired, and where GIS would fit in the village administrative hierarchy. These are legitimate (although not insurmountable) concerns for any entity beginning a GIS program, but most of the issues could be easily worked through with some mentoring from Chugachmiut, CRRC, or Mapping Solutions personnel and some minimal additional funding. Furthermore, Chugachmiut, CRRC, or Mapping Solutions staff could help the village write an initial grant to support GIS and then encourage the villages to write GIS into all grant proposals to help continue to fund GIS endeavors.

12. We recommend that a Region-wide training program be conducted for all GIS users, even those who have had some training. This training would be conducted in Anchorage by an organization such as Mapping Solutions, which has had experience working with tribes on GIS projects and issues. This training would incorporate datasets from Alaska and expressly from the Chugachmiut region whenever possible, and the training would focus specifically on those skills that the village GIS specialist would need to get their village program underway. This would give all individuals experience with datasets that they will actually use in their village programs. Often times commercial GIS training programs use datasets from outside of Alaska, such as ATM locations in Atlanta, Georgia, which have no relevance to the needs of village Alaskans. Additionally, the training would introduce the village GIS specialist to four important topics:

    o The diverse ways that GIS could be applied to issues, problems, or questions within the villages. GIS has many uses beyond natural

a. annual or biannual training workshops where all GIS specialists get together on a regular basis to enhance their GIS skills and deal with issues of mutual interest.
b. training for new GIS specialists when new people become involved in the GIS program.

MAPPING SOLUTIONS ASSESSMENT OF NATIVE VILLAGE OF EYAK

1. Some of the residents Eyak understand and show a good level of interest for adopting and using GIS. They identified a number of potential uses of GIS. The villagers' ideas in part are included as Native Village of Eyak Villagers' Ideas section.

2. Eyak is fortunate to have ArcGIS 9 software and computers suitable for running the program.

3. Eyak had a member of its the staff who is trained in GIS, however, this person's GIS skills are rusty (as is typically the case with anyone who does not use the software on a regular basis). He would benefit by retaking the Chugachmiut/CRRC-wide GIS training followed with mentoring in the set up and organization of individual village GIS systems. This mentoring will help keep the village from running into problems that can slow or hinder the process of becoming operational in GIS.

4. Eyak would be an excellent site for a "demonstration project" to show other Chugachmiut villages how GIS could be incorporated within the village planning and management as the villagers already have ideas on the utility of GIS to their lands and resources. The village's roads and trails mapping inventory—a requirement of BIA—would be an excellent demonstration project. An inexpensive ($150-300) GPS would need to be purchased, and the GIS person in the Region-wide GIS training would learn how to bring the GPS coordinates into the GIS.

MAPPING SOLUTIONS COMMENTS TO THE VILLAGERS OF EYAK

Our report on the ideas and concerns of Eyak villagers about GIS is based on our notes taken during the meeting and the surveys submitted by residents. If we have not expressed your feelings correctly or clearly enough, or if you have developed different or additional ideas or concerns, please send them to Mapping Solutions so they we can have a complete and correct record of the ideas of the village residents.

<div align="center">

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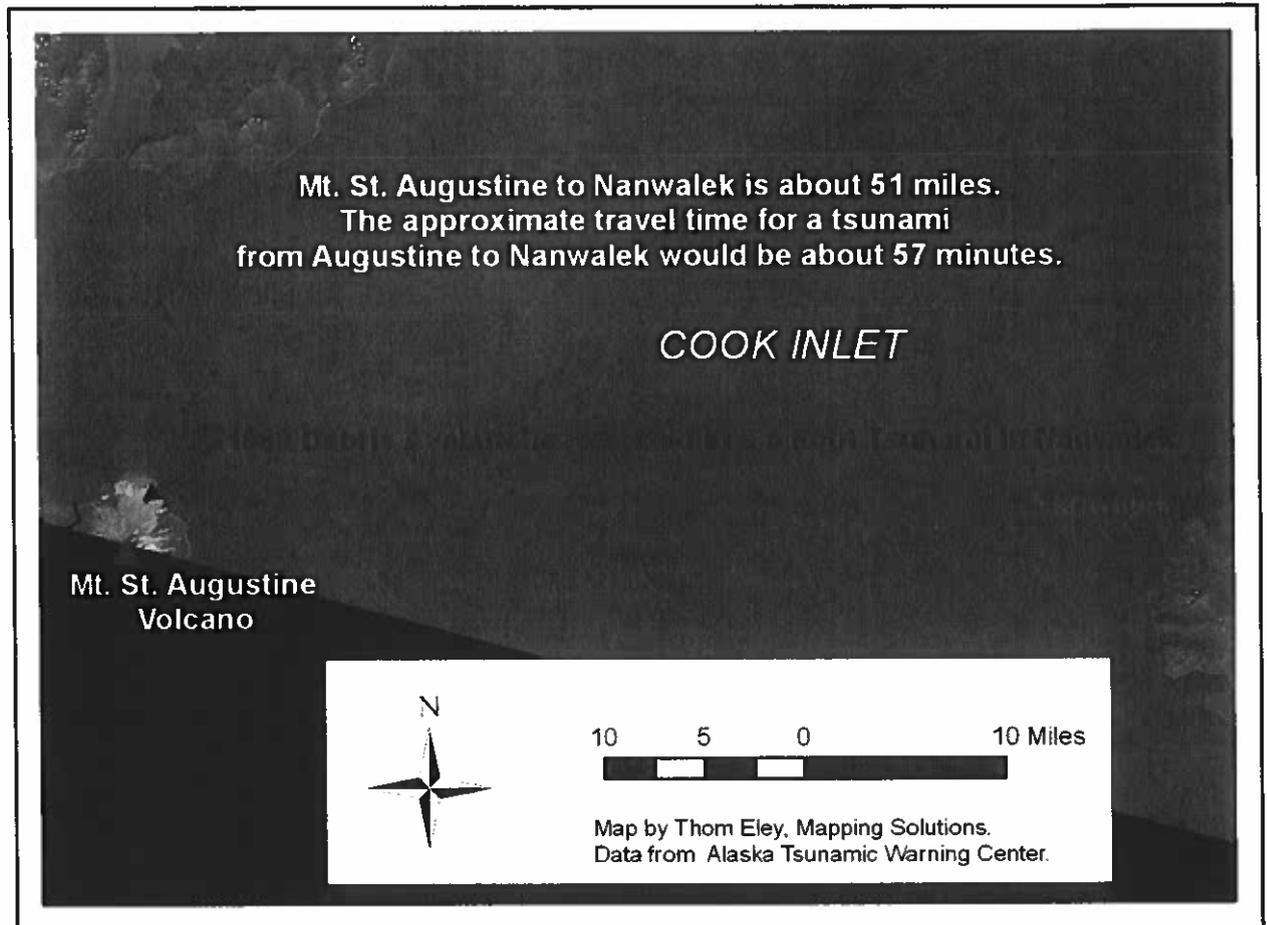**Phone: (907) 561-4627**

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Last but certainly not least, we would like to thank the residents of the Native Village of Eyak for the help and hospitality you showed us on our visit. We greatly enjoyed visiting your beautiful and friendly village and meeting and talking with you. We look forward to coming back to see you again and spending a longer time.

EYAK VILLAGERS' IDEAS
Eyak Survey Results for GIS Usage (n=1)

- Community expansion
  - Lots and property boundaries
    - Native allotments—400 sites need to be surveyed once a road is put in for access

- Environmental
  - Contamination
    - Old generator near Eyak Lake
  - Delta changes due to climate change

- Community resources
  - Hunting areas
  - Fishing areas
  - Berry picking areas

- Natural resources
  - Sea otter count
  - Sea lion rookeries
  - Fisheries-tagging

- Cultural
  - Historical sites
  - Graveyard, old cemetery

- Infrastructure
  - Roads and trails
  - Educational benefits:
    - Bring GIS and info into the classroom because there is none now
    - The more technology imposed on children, the better
- Information sources:
  - Local residents could help Eyak document the trails, which could then be documented with a GPS and brought into the GIS.

Chugachmiut GIS (Geographic Information System) Needs Analysis Village Report

Nanwalek

Mt. St. Augustine to Nanwalek is about 51 miles.
The approximate travel time for a tsunami
from Augustine to Nanwalek would be about 57 minutes.

COOK INLET

Mt. St. Augustine
Volcano

N

10   5   0   10 Miles

Map by Thom Eley, Mapping Solutions.
Data from Alaska Tsunamic Warning Center.

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February 19, 2006

INTRODUCTION

In November 2004, Chugachmiut and Chugach Regional Resources Commission (CRRC) contracted with Mapping Solutions (Dr. Cherie Northon and Dr. Thom Eley) to conduct a GIS needs analysis of their region.   Chugachmiut and CRRC want to empower villages to develop their own GIS and GPS capabilities for economic, social, and resource development and to share resources and ideas on a regional level for the mutual benefit of all Native residents. Mapping Solutions' role was to assess the level of knowledge, interest, skill, and technical capabilities as well as relevant issues in five of the Chugachmiut tribes: Nanwalek, Port Graham, Chenega Bay, Tatitlek, and Native Village of Eyak.

During Spring and Summer 2005, Drs. Northon and Eley (Mapping Solutions), Charlie Sink (Chugachmiut), and Christine Celantano (CRRC) visited the five villages, talked about GIS, its capabilities and the interest and experience of tribal members in using GIS to assist their village, and conducted a GIS needs analysis survey utilizing two questionnaires. One survey was general to elicit ideas about the use of GIS from a broad audience, the other was geared at getting information about the technical capabilities.

NANWALEK VISIT

This report summarizes the assessment for Nanwalek, which was accomplished during our visit on May 19, 2005.   Present at the Nanwalek meeting were village members: Chief Emilie Swenning, Nancy Yeaton, Kelly Yeaton, Rhoda Moonin, Nancy Radtke, Alma Moonin, Zoya Greene, Eugenia Moonin, Ephim H. Moonin, Sally Ash, and Peter Ukatish as well as Charlie Sink, Christine Celantano, Cherie Northon, and Thom Eley. Half of the twelve attendees had heard of GIS previously, and regardless of previous knowledge there was a lot of input presented by the group.

NANWALEK COMMENTS

This village is looking toward the future especially since there currently is a population boom here. Housing is in very short supply, so how and where the village can expand is of primary importance. Clearly delineating Native allotments and boundaries, guaranteeing a good water supply, determining where future land fill and the sludge lagoon can be located, and maintaining a usable landing strip are of great concern. There is worry about the proximity of the propane tanks to the school and whether the tanks or the school should be relocated.

Several environmental issues were listed. Residents want to make sure salmon runs and returns are monitored as well as changes in wildlife—even expanding protection to some species. Concerns about the marine environment ranged from fish migration to changes in the shoreline, lagoon, sandbar, beach, kelp, and reef. Erosion on the surrounding hills as well as near the airstrip are being noticed by the residents,

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and mention was made about changes in weather patterns that could be measured (snow and rainfall). Wetlands and plants, particularly those for medicinal use, are important.

Preservation of traditional gathering areas and perhaps even a means of identifying usage areas were listed as concerns. Several residents want to make sure that the history of their village is not lost—this includes burial sites, traditional place names, traditional knowledge, and family roots.

Nanwalek residents were quick to see the educational benefits of inventorying and mapping their village, and they were particularly vocal in expressing their desire to have GIS not only available for their village but as part of the school curriculum. The result they envisioned would be a bridge between the elders and their knowledge with youth in the village. Everyone in the village was viewed as a provider of some type of information, and one good suggestion was that people keep calendars of their observations, which could then be compiled into a database.

MAPPING SOLUTIONS REGION-WIDE ASSESSMENT

Based on our assessment of Chugachmiut, CRRC, and the five tribes, Mapping Solutions is pleased to make the following recommendation and/or general comments concerning the adoption of a region-wide yet village-based GIS program:

1. Geographic Information Systems (GIS) has become standard technology for the management of natural and human systems, and it is utilized by tribes, Native Corporations, State and Federal agencies, private business, NGO's, and a number of other organizations.

2. A GIS is now an essential tool of cultural survival and economic development, and without the development of GIS capabilities, villages are limiting the opportunities available to them for self-determination.

3. Chugachmiut and CRRC understand the value of GIS and utilizing GIS software to accomplish their missions. Further, CRRC and Chugachmiut would like to see the increased usage of GIS within their entities and amongst the villages.

4. Chugachmiut and CRRC would like to empower villages to develop their own GIS capabilities for economic, social, and resource development and to share resources and ideas on a local, regional, national, and international level for the mutual benefit of all Native residents.

5. The development of GIS skills in villages involves local people and local knowledge in dealing with local issues.

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6. GIS maps signify what is happening within communities and lands, are symbols and instruments of power, and are tools for control.

7. GIS maps can be used to rename, reclaim, manage, and plan for the use of lands and resources.

8. Further, other sophisticated technology such as Global Position Systems (GPS), aerial photography, and satellite imagery can be combined within and enhance the power of the GIS.

9. Mapping Solutions was able to assess the level of knowledge, interest, skill, and technical capabilities as well as relevant issues in five of the Chugachmiut tribes: Nanwalek, Port Graham, Native Village of Chenega, Tatitlek, and Native Village of Eyak.

10. All villages were interested in developing a level of GIS capability, and the five villages came up with a diverse inventory of potential uses and benefits of GIS as well as an outstanding list of data sources as well as individuals in or associated with their community who could work with the GIS.

11. Even so, the villagers were concerned with how GIS would be funded, supported, personnel trained, hardware and software acquired, and where GIS would fit in the village administrative hierarchy. These are legitimate (although not insurmountable) concerns for any entity beginning a GIS program, but most of the issues could be easily worked through with some mentoring from Chugachmiut, CRRC, or Mapping Solutions personnel and some minimal additional funding. Furthermore, Chugachmiut, CRRC, or Mapping Solutions staff could help the village write an initial grant to support GIS and then encourage the villages to write GIS into all grant proposals to help continue to fund GIS endeavors.

12. We recommend that a Region-wide training program be conducted for all GIS users, even those who have had some training. This training would be conducted in Anchorage by an organization such as Mapping Solutions, which has had experience working with tribes on GIS projects and issues. This training would incorporate datasets from Alaska and expressly from the Chugachmiut region whenever possible, and the training would focus specifically on those skills that the village GIS specialist would need to get their village program underway. This would give all individuals experience with datasets that they will actually use in their village programs. Often times commercial GIS training programs use datasets from outside of Alaska, such as ATM locations in Atlanta, Georgia, which have no relevance to the needs of village Alaskans. Additionally, the training would introduce the village GIS specialist to four important topics:

    a) The diverse ways that GIS could be applied to issues, problems, or questions within the villages. GIS has many uses beyond natural resources and general planning, but these issues are rarely pointed out to beginning users.

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b) The course would cover the importance and establishment of GIS standards for measurements and data collection that would apply on a Region-wide basis, which allows for accurately collecting and easily sharing data with others.

c) Application of GPS to village data collection and incorporating GPS data into the GIS database—there are some pitfalls here and the village GIS specialists would learn to avoid these.

d) Considerable attention would be given to GIS mapping issues specific to Alaska Native villages, such as subsistence and local knowledge mapping, security and sharing of sensitive data, and how young people can be incorporated into GIS mapping and data collection projects.

13. Following the training, a Mapping Solutions staff person or other trainer should go to each of the villages and help the village GIS specialist set up the software and datasets on his or her computer so that the configuration and organization are uniform throughout the region. This uniformity would assist in troubleshooting when the need arises. The trainer and village GIS specialist can assure that everything is operational and all datasets and other information can be located. This will keep people from running into frustrating problems, albeit simple ones, that can hinder the process of becoming operational.

14. Further, when the village has a specific project waiting the application of GIS, the trainer could help the village GIS specialist get started on this task. Often times the first steps into a project are the most difficult, so some mentoring by the trainer would assure a smooth launch of the villages' GIS programs.

15. A region-wide GIS position should be established in Chugachmiut, and this position would function to produce GIS products for the corporation, oversee GIS data storage in the Corporation's blade server, which would be made available to villages to assist in their data storage and security, acquire and provide datasets that would be of help to the villages and CRRC, and function as a GIS mentor for the village GIS specialist. As a GIS mentor, this individual could help village specialists with troubleshooting of GIS programs, provide advice on GIS issues and formulate and cooperate on specific GIS projects of region-wide interest and importance. Additionally, the region-wide GIS person would assure that the GIS standards are established and adhered to by all persons gathering GIS data for the villages and Corporation. Finally, this region-wide GIS specialist could arrange:
   o annual or biannual training workshops where all GIS specialists get together on a regular basis to enhance their GIS skills and deal with issues of mutual interest.
   o training for new GIS specialists when new people become involved in the GIS program.

MAPPING SOLUTIONS ASSESSMENT OF NANWALEK

1. A number of residents of Nanwalek have had some experience and training in GIS, and the villagers demonstrated a high level of enthusiasm for adopting and using GIS. Nanwalek would be an excellent site for a "demonstration project" to show other Chugachmiut villages how GIS could be incorporated within the village planning and management as the villagers already have ideas on the utility of GIS to their lands and resources. The villagers' ideas are included as Nanwalek Villagers' Ideas section. Many residents also expressed interest in learning GIS.

2. Villagers are, however, unsure where GIS exactly fits within the village governmental hierarchy, but this could be overcome with mentoring the village in adopting GIS.

3. GIS software, computer, and associated equipment need to be acquired or assigned for developing a successful GIS program to occur. Again, these seem to be minor problems that the village could work through with some mentoring from Chugachmiut or CRRC personnel and some minimal additional funding. Furthermore, corporation or CRRC staff could help the village write GIS into grant proposals to help continue to fund GIS endeavors. These activities coupled with a Chugachmiut/CRRC-wide GIS training followed with mentoring in the set up and organization of individual village GIS systems would assist the designated GIS personnel in their actual startup of their program. This will keep people from running into problems that can slow or hinder the process of becoming operational.

4. A digital camera and internet connection are available within the community, and a GPS may be available. If not available, a GPS is reasonably inexpensive to purchase, but training should be given on its proper use—setting the datum and locational units, etc.

5. An excellent possibility for Nanwalek would be to work with an organization, such as Mapping Solutions, which understands Native cultures and their concern for data sensitivity as well as GIS and mapping of traditional knowledge, and write a joint grant for GIS and GPS mapping of specific village concerns. Possible projects would be fuel and propane tanks, cemetery burials, local place names, subsistence use areas, or other traditional knowledge. Mapping Solutions would work hand-in-hand with the village to assure success on their first GIS mapping venture, thereby enhancing their skills and track record for future work.

MAPPING SOLUTIONS COMMENTS TO THE VILLAGERS OF NANWALEK

Our report on the ideas and concerns of Nanwalek about GIS is based on our notes taken during the meeting and the surveys submitted by village residents. If we have not expressed your feelings correctly or clearly enough, or if you have developed different

or additional ideas or concerns, please send them to Mapping Solutions so that we can have a complete and correct record of the ideas of the residents of Nanwalek.

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Last but certainly not least, we would like to thank the residents of Nanwalek for the help and hospitality you showed us on our visit. We greatly enjoyed visiting your beautiful and friendly village and meeting and talking with you. We look forward to coming back to see you again and spending a longer time.

<div align="center">

NANWALEK VILLAGERS' IDEAS
Nanwalek Survey Results for GIS Usages (n=12)

</div>

Potential Uses of GIS:
- "Great technology to learn, and can be taught in almost every subject—even art!!"

- Community expansion
  - Available land
  - Water supply
  - Future land fill/sludge lagoon
  - Document village growth—past and future
  - Future school location
  - Housing
  - Population changes (+ and -)
  - Future airport, harbor, businesses
  - Lots and property boundaries
    - Native allotments

- Environmental
  - Contamination
    - Fuel storage tank/propane storage near school
      - Change to oil or electricity as a safety concern
      - Diesel spill discharge
    - Sewage
    - Garbage/land fill
      - Leaching
      - Amounts
    - Sludge lagoon

- Weather patterns
  - Patterns

<div align="center">46</div>

- o Changes: measure snow and rain

- Community resources
    - o Traditional gathering areas
    - o Usage areas, council areas, respect boundaries
    - o Preserving land

- Environment
    - o Salmon runs/returns
    - o Fish migration
    - o Wildlife
        - Changes
        - Migrations
        - Protection of species
    - o Rivers
    - o Reef
    - o Shoreline, lagoon, sandbar changes
    - o Beach
        - Runoff
    - o Kelp movement
    - o Wetlands
    - o Land use/change
    - o Erosion, erosion control of hill and runway areas
    - o Plants
        - Those used for medicinal purposes
        - Wild flower areas

- Cultural
    - o Family roots
    - o Burial sites
    - o Traditional place names
    - o Language preservation
    - o Traditional knowledge
    - o History

- Infrastructure
    - o Old Alaska Commercial Company trail
    - o Housing
    - o Sewage and water lines
    - o Airport/landing strip
    - o Breakwater

Educational benefits:
- Bring GIS and info into the classroom
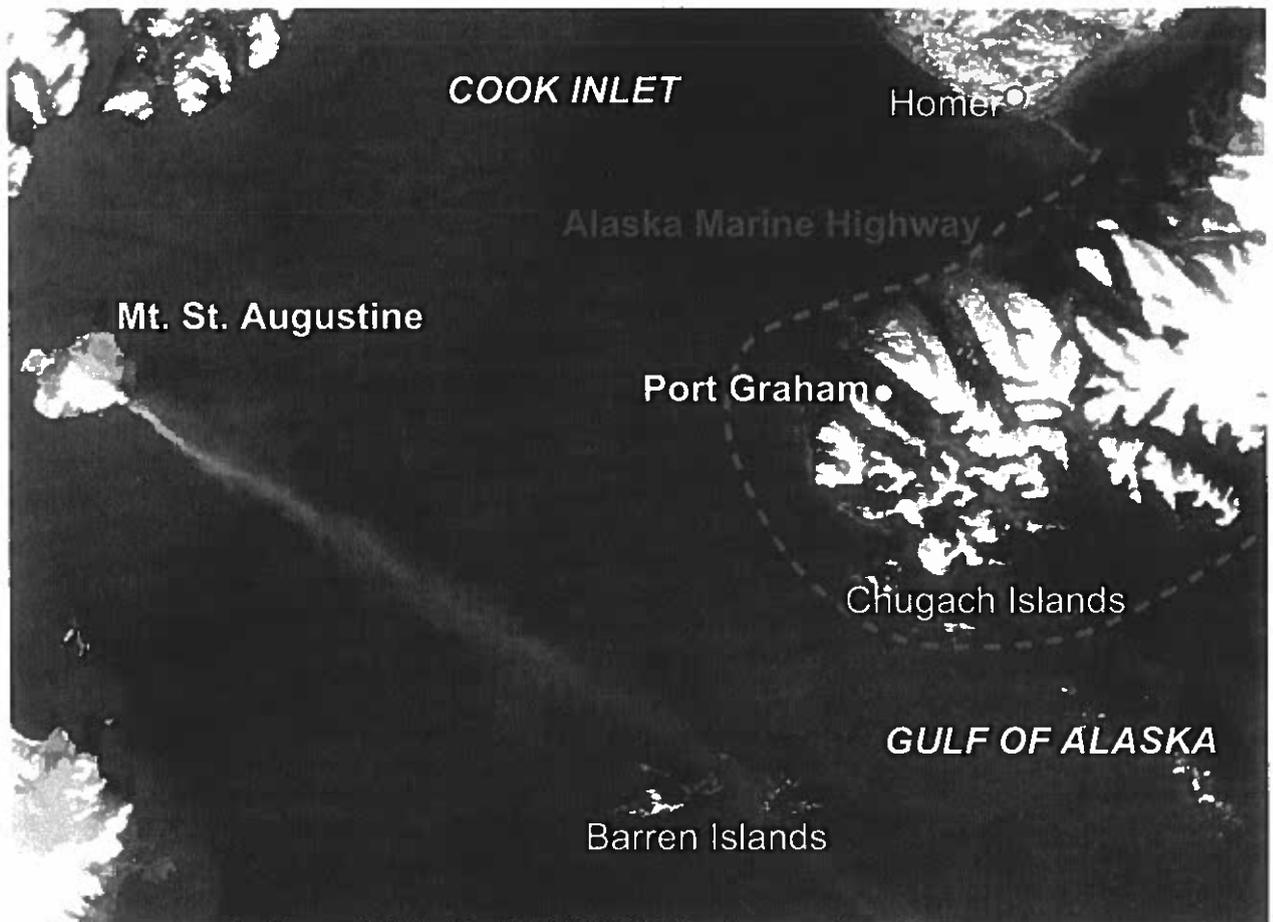- Hire an intern from high school

- Provide the elders with information and training
- Help kids with village history
- Job potential
- New museum
- For outsiders to get information
- Curriculum

Information sources:
- Elders
- Youth
- General community
- Locals
- Keep calendars of information

Chugachmiut GIS (Geographic Information System) Needs Analysis Village Report

Port Graham

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February 19, 2006

INTRODUCTION

In November 2004, Chugachmiut and Chugach Regional Resources Commission (CRRC) contracted with Mapping Solutions (Dr. Cherie Northon and Dr. Thom Eley) to conduct a GIS needs analysis of their region. Chugachmiut and CRRC want to empower villages to develop their own GIS and GPS capabilities for economic, social, and resource development and to share resources and ideas on a regional level for the mutual benefit of all Native residents. Mapping Solutions' role was to assess the level of knowledge, interest, skill, and technical capabilities as well as relevant issues in five of the Chugachmiut tribes: Nanwalek, Port Graham, Chenega Bay, Tatitlek, and Native Village of Eyak.

During Spring and Summer 2005, Drs. Northon and Eley (Mapping Solutions), Charlie Sink (Chugachmiut), and Christine Celantano (CRRC) visited the five villages, talked about GIS, its capabilities and the interest and experience of tribal members in using GIS to assist their village, and conducted a GIS needs analysis survey utilizing two questionnaires. One survey was general to elicit ideas about the use of GIS from a broad audience, the other was geared at getting information about the technical capabilities.

PORT GRAHAM VISIT

This report summarizes the assessment for Port Graham, which was accomplished during our visit on May 18, 2005. Present at the Port Graham meeting were village members: Chief Pat Norman, Violet Yeaton, Fran Norman, and Stormin' Norman as well as Charlie Sink, Christine Celantano, Cherie Northon, and Thom Eley. The village members who attended the meeting were all conversant in GIS, and Chief Norman's son was actually working with it and other programs at the Chugach Corporation in Anchorage where he is a student.

PORT GRAHAM COMMENTS

Future development and planning are very important to Port Graham. They anticipate dealing with roads, housing, land fill, water and sewage infrastructure, fire and other emergency plans, and individual property boundaries. The community resources that are of concern include traditional harvest areas and their management along with the hatchery in the bay adjacent to the town. Wetlands and watershed management are important environmental issues as well as documenting change in resources. Involving the community elders and the youth was mentioned as information source gatherers.

Preservation of traditional gathering areas and perhaps even a means of identifying use areas were listed as concerns. Several residents want to make sure that the history of their village is not lost—this includes traditional place names, traditional knowledge, and family roots. Port Graham residents were quick to see the educational benefits of

inventorying and mapping their village. They were particularly vocal in expressing their desire to have GIS as part of the school curriculum; however, residents were unsure about how this incorporation into the educational curriculum would be effected. Attendees also recognized the potential for GIS training to result in employment opportunities for the village's youth. Village residents also envisioned that GIS could be a bridge between the elders and their knowledge with youth in the village. Everyone in the village was viewed as a provider of some type of information, and their observations could be compiled into an important village database.

In Port Graham, the residents who attended the meeting were familiar with GIS and some residents actually had GIS experience with ArcView 3x and MapInfo. Port Graham indicated that they have a computer which could be dedicated to GIS, and there are other resources available such as ESRI software, a GPS, and digital camera. Internet connections are decent (DSL). There are people in the village who could commit to maintaining a GIS as long as there is a funding source available. A concern about confidentiality of data exists, and decisions must be made on what is to be kept within the village and that which can be shared. As would be expected, this is a common issue among all the villages.

MAPPING SOLUTIONS REGION-WIDE ASSESSMENT

Based on our assessment of Chugachmiut, CRRC, and the five tribes, Mapping Solutions is pleased to make the following recommendation and/or general comments concerning the adoption of a region-wide yet village-based GIS program:

1. Geographic Information Systems (GIS) has become standard technology for the management of natural and human systems, and it is utilized by tribes, Native Corporations, State and Federal agencies, private business, NGO's, and a number of other organizations.

2. A GIS is now an essential tool of cultural survival and economic development, and without the development of GIS capabilities, villages are limiting the opportunities available to them for self-determination.

3. Chugachmiut and CRRC understand the value of GIS and utilizing GIS software to accomplish their missions. Further, CRRC and Chugachmiut would like to see the increased usage of GIS within their entities and amongst the villages.

4. Chugachmiut and CRRC would like to empower villages to develop their own GIS capabilities for economic, social, and resource development and to share resources and ideas on a local, regional, national, and international level for the mutual benefit of all Native residents.

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5. The development of GIS skills in villages involves local people and local knowledge in dealing with local issues.

6. GIS maps signify what is happening within communities and lands, are symbols and instruments of power, and are tools for control.

7. GIS maps can be used to rename, reclaim, manage, and plan for the use of lands and resources.

8. Further, other sophisticated technology such as Global Position Systems (GPS), aerial photography, and satellite imagery can be combined within and enhance the power of the GIS.

9. Mapping Solutions was able to assess the level of knowledge, interest, skill, and technical capabilities as well as relevant issues in five of the Chugachmiut tribes: Nanwalek, Port Graham, Native Village of Chenega, Tatitlek, and Native Village of Eyak.

10. All villages were interested in developing a level of GIS capability, and the five villages came up with a diverse inventory of potential uses and benefits of GIS as well as an outstanding list of data sources as well as individuals in or associated with their community who could work with the GIS.

11. Even so, the villagers were concerned with how GIS would be funded, supported, personnel trained, hardware and software acquired, and where GIS would fit in the village administrative hierarchy. These are legitimate (although not insurmountable) concerns for any entity beginning a GIS program, but most of the issues could be easily worked through with some mentoring from Chugachmiut, CRRC, or Mapping Solutions personnel and some minimal additional funding. Furthermore, Chugachmiut, CRRC, or Mapping Solutions staff could help the village write an initial grant to support GIS and then encourage the villages to write GIS into all grant proposals to help continue to fund GIS endeavors.

12. We recommend that a Region-wide training program be conducted for all GIS users, even those who have had some training. This training would be conducted in Anchorage by an organization such as Mapping Solutions, which has had experience working with tribes on GIS projects and issues. This training would incorporate datasets from Alaska and expressly from the Chugachmiut region whenever possible, and the training would focus specifically on those skills that the village GIS specialist would need to get their village program underway. This would give all individuals experience with datasets that they will actually use in their village programs. Often times commercial GIS training programs use datasets from outside of Alaska, such as ATM locations in Atlanta, Georgia, which have no relevance to the needs

of village Alaskans.   Additionally, the training would introduce the village GIS specialist to four important topics:

- o The diverse ways that GIS could be applied to issues, problems, or questions within the villages. GIS has many uses beyond natural resources and general planning, but these issues are rarely pointed out to beginning users.

- o The course would cover the importance and establishment of GIS standards for measurements and data collection that would apply on a Region-wide basis, which allows for accurately collecting and easily sharing data with others.

- o Application of GPS to village data collection and incorporating GPS data into the GIS database—there are some pitfalls here and the village GIS specialists would learn to avoid these.

- o Considerable attention would be given to GIS mapping issues specific to Alaska Native villages, such as subsistence and local knowledge mapping, security and sharing of sensitive data, and how young people can be incorporated into GIS mapping and data collection projects.

13. Following the training, a Mapping Solutions staff person or other trainer should go to each of the villages and help the village GIS specialist set up the software and datasets on his or her computer so that the configuration and organization are uniform throughout the region. This uniformity would assist in troubleshooting when the need arises. The trainer and village GIS specialist can assure that everything is operational and all datasets and other information can be located. This will keep people from running into frustrating problems, albeit simple ones, that can hinder the process of becoming operational.

14. Further, when the village has a specific project waiting the application of GIS, the trainer could help the village GIS specialist get started on this task. Often times the first steps into a project are the most difficult, so some mentoring by the trainer would assure a smooth launch of the villages' GIS programs.

15. A region-wide GIS position should be established in Chugachmiut, and this position would function to produce GIS products for the corporation, oversee GIS data storage in the Corporation's blade server, which would be made available to villages to assist in their data storage and security, acquire and provide datasets that would be of help to the villages and CRRC, and function as a GIS mentor for the village GIS specialist. As a GIS mentor, this individual could help village specialists with troubleshooting of GIS programs, provide advice on GIS issues and formulate and cooperate on specific GIS projects of region-wide interest and importance. Additionally, the region-wide

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GIS person would assure that the GIS standards are established and adhered to by all persons gathering GIS data for the villages and Corporation. Finally, this region-wide GIS specialist could arrange:

- o annual or biannual training workshops where all GIS specialists get together on a regular basis to enhance their GIS skills and deal with issues of mutual interest.
- o training for new GIS specialists when new people become involved in the GIS program.

MAPPING SOLUTIONS ASSESSMENT OF PORT GRAHAM

16. The residents of Port Graham demonstrated a high level of knowledge about GIS and its benefits to the village. Since some villagers have some training in GIS, Port Graham might be a good site for a "demonstration project" to show other Chugachmiut villages how GIS could be incorporated within the village planning and management. A demonstration that focused on land fill or traditional knowledge or use areas seem to be topics that would engender village interest and support. The villagers' ideas are included in the Port Graham Villagers' Ideas section.

17. Attendees felt that the GIS program would probably fit best under their environmental program, but there were other people in the village who could commit to maintaining the GIS program as long as a funding source is available. Everyone understood that GIS could benefit a number of other village programs as well as the environmental program. Corporation, CRRC, or Mapping Solutions staff could help the village write GIS into grant proposals to help continue to fund GIS endeavors.

18. Port Graham indicated that they have a computer which can be dedicated to GIS, and there are other resources available such as ESRI software, a GPS, and digital camera. Internet connections are decent (DSL).

19. Concerns were expressed about the confidentiality of certain data, and decisions must be made on what is to be kept within the village and that which can be shared. As would be expected, this is a common issue among all the villages.

20. The Chief and others asked about training and maintaining Chugachmiut/CRRC-wide GIS training followed with mentoring in the set up and organization of individual village GIS systems will assist the designated GIS personnel in their actual startup of their program. This will keep people from running into problems that can slow or hinder the process of becoming operational.

21. If the village was interested in mapping traditional knowledge, subsistence use areas, or even landfills and water systems, we recommend that Port

Graham work with an organization, such as Mapping Solutions, which understands Native cultures and their concern for data sensitivity as well as GIS and mapping of traditional knowledge. Further, a joint grant for GIS and GPS mapping of specific village concerns could be written. Mapping Solutions would work hand-in-hand with the village to assure success on their first GIS mapping venture, thereby enhancing their skills and track record for future work.

MAPPING SOLUTIONS COMMENTS TO THE VILLAGERS OF PORT GRAHAM

Our report on the ideas and concerns of Port Graham about GIS is based on our notes taken during the meeting and the surveys submitted by village residents. If we have not expressed your feelings correctly or clearly enough, or if you have developed different or additional ideas or concerns, please send them to Mapping Solutions so they we can have a complete and correct record of the ideas of the residents of Port Graham.

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Last but certainly not least, we would like to thank the residents of Port Graham for the help and hospitality you showed us on our visit. We greatly enjoyed visiting your beautiful and friendly village and meeting and talking with you. We look forward to coming back to see you again and spending a longer time.
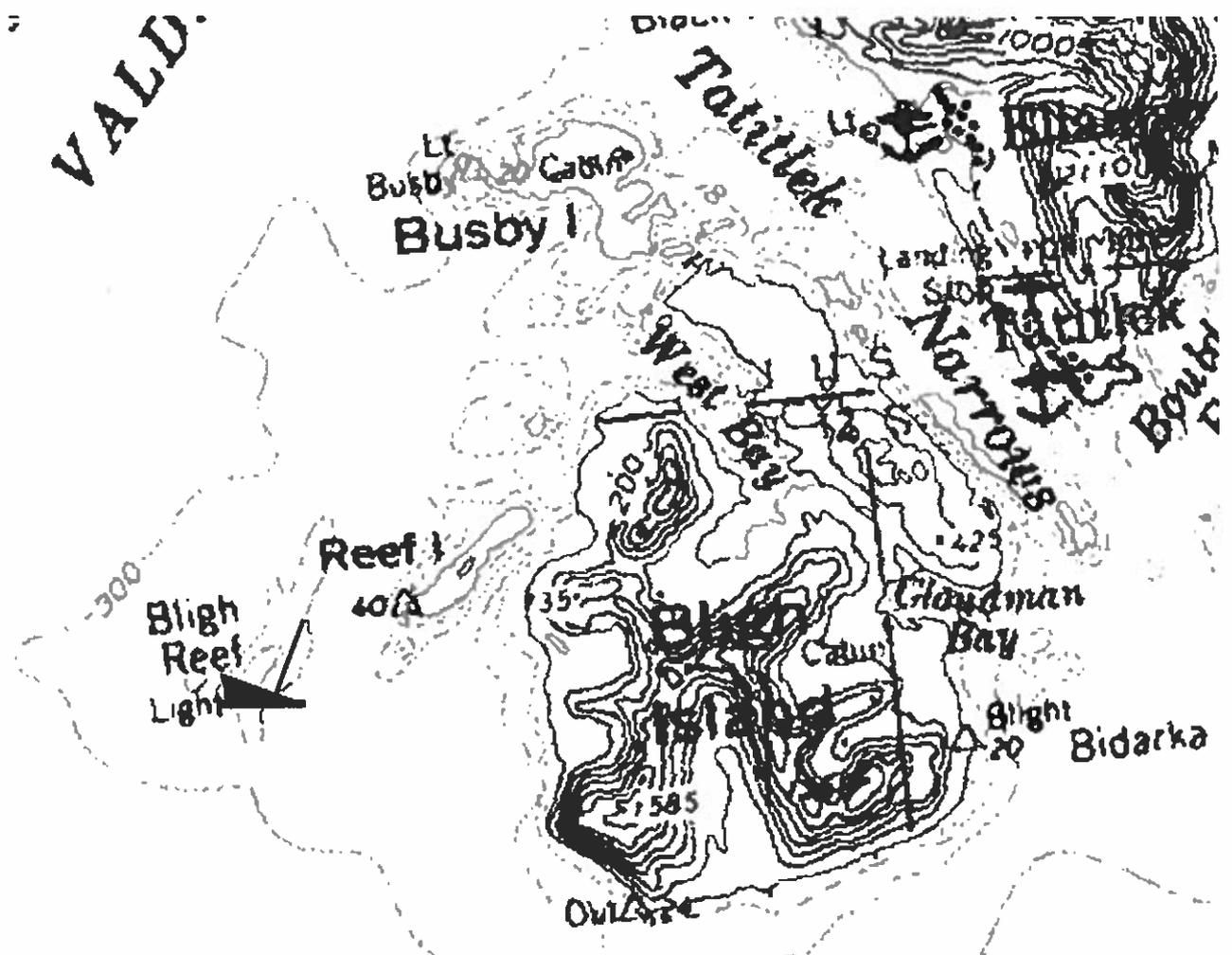
PORT GRAHAM VILLAGERS' IDEAS
Port Graham Survey Results for GIS Usages (n=10)

- Community expansion/planning
    - Future roads
    - Future housing
    - Future land fill
    - City planning
    - Lots and property boundaries

- Environmental
    - Garbage/land fill

- Community resources
    - Traditional harvest areas
    - Areas for hunting, food gathering locations
    - Hatchery for planning
    - Traditional resource management

- Environment
  - Wetlands
  - Port Graham/Nanwalek Watershed
  - Clean water
  - Natural resource usage via monitoring
  - Document change
  - Forestry

- Cultural—nothing specific

- Infrastructure
  - Maintenance of water/sewer lines
  - Building roads and existing road system
  - Sewage and water lines
  - Fire planning
  - Tsunami planning

- Educational benefits:
  - Teaching kids
  - Job potential/educational pursuit for youth
  - Cultural display facility

- Information sources:
  - Elders
  - Youth
  - General community
  - Locals!!!
  - Parents

Chugachmiut GIS (Geographic Information System) Needs Analysis Village Report

Tatitlek, Alaska

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February 19, 2006

INTRODUCTION

In November 2004, Chugachmiut and Chugach Regional Resources Commission (CRRC) contracted with Mapping Solutions (Dr. Cherie Northon and Dr. Thom Eley) to conduct a GIS needs analysis of their region. Chugachmiut and CRRC want to empower villages to develop their own GIS and GPS capabilities for economic, social, and resource development and to share resources and ideas on a regional level for the mutual benefit of all Native residents. Mapping Solutions' role was to assess the level of knowledge, interest, skill, and technical capabilities as well as relevant issues in five of the Chugachmiut tribes: Nanwalek, Port Graham, Native Village of Chenega, Tatitlek, and Native Village of Eyak.

During Spring and Summer 2005, Drs. Northon and Eley (Mapping Solutions), Charlie Sink (Chugachmiut), and Christine Celantano (CRRC) visited the five villages, talked about GIS, its capabilities and the interest and experience of tribal members in using GIS to assist their village, and conducted a GIS needs analysis survey utilizing two questionnaires. One survey was general to elicit ideas about the use of GIS from a broad audience, the other was geared at getting information about the technical capabilities.

TATITLEK VISIT

This report summarizes the assessment for the Native Village of Tatitlek, which was accomplished during our visit on June 24, 2005. Present at the Tatitlek meeting were: Chief Gary Kompkoff, Steve Totemoff, and Ron Totemoff, as well as Charlie Sink, Christine Celantano, Cherie Northon, and Thom Eley.

TATITLEK COMMENTS

As of this date, the surveys have not been received by Mapping Solutions. The information presented here is based on our discussion with village residents during our June 24 visit, and in additional discussions with Gary Kompkoff.

A number of issues concern the residents of Tatitlek, particularly an intrusion of tourists due to scheduled ferry stops at Tatitlek during daytime hours and the preservation of the village's lifestyle. After the Exxon Valdez spill, the residents of Tatitlek were impacted by a deluge of outsiders working on the clean-up, who made the locals feel like they had been invaded and lost their privacy. It was described as living in a fishbowl. Another issue that may occur soon has to do with burial space of Russian Orthodox and non Russian Orthodox Church members. The "Native Village of Tatitlek, Tribal Natural Resource Management Plan", prepared by the village IRA Council in July 2003 document resource management concerns of the village.

Residents understood the value of GIS and how it could be used to help them with their planning and management issues. However, frustration was expressed by those

in attendance regarding the lack of funds to support GIS and how training would be obtained.

MAPPING SOLUTIONS REGION-WIDE ASSESSMENT

Based on our assessment of Chugachmiut, CRRC, and the five tribes, Mapping Solutions is pleased to make the following recommendation and/or general comments concerning the adoption of a region-wide yet village-based GIS program:

1. Geographic Information Systems (GIS) has become standard technology for the management of natural and human systems, and it is utilized by tribes, Native Corporations, State and Federal agencies, private business, NGO's, and a number of other organizations.

2. A GIS is now an essential tool of cultural survival and economic development, and without the development of GIS capabilities, villages are limiting the opportunities available to them for self-determination.

3. Chugachmiut and CRRC understand the value of GIS and utilizing GIS software to accomplish their missions. Further, CRRC and Chugachmiut would like to see the increased usage of GIS within their entities and amongst the villages.

4. Chugachmiut and CRRC would like to empower villages to develop their own GIS capabilities for economic, social, and resource development and to share resources and ideas on a local, regional, national, and international level for the mutual benefit of all Native residents.

5. The development of GIS skills in villages involves local people and local knowledge in dealing with local issues.

6. GIS maps signify what is happening within communities and lands, are symbols and instruments of power, and are tools for control.

7. GIS maps can be used to rename, reclaim, manage, and plan for the use of lands and resources.

8. Further, other sophisticated technology such as Global Position Systems (GPS), aerial photography, and satellite imagery can be combined within and enhance the power of the GIS.

9. Mapping Solutions was able to assess the level of knowledge, interest, skill, and technical capabilities as well as relevant issues in five of the Chugachmiut tribes: Nanwalek, Port Graham, Native Village of Chenega, Tatitlek, and Native Village of Eyak.

10. All villages were interested in developing a level of GIS capability, and the five villages came up with a diverse inventory of potential uses and benefits of GIS as well as an outstanding list of data sources as well as individuals in or associated with their community who could work with the GIS.

11. Even so, the villagers were concerned with how GIS would be funded, supported, personnel trained, hardware and software acquired, and where GIS would fit in the village administrative hierarchy. These are legitimate (although not insurmountable) concerns for any entity beginning a GIS program, but most of the issues could be easily worked through with some mentoring from Chugachmiut, CRRC, or Mapping Solutions personnel and some minimal additional funding. Furthermore, Chugachmiut, CRRC, or Mapping Solutions staff could help the village write an initial grant to support GIS and then encourage the villages to write GIS into all grant proposals to help continue to fund GIS endeavors.

12. We recommend that a Region-wide training program be conducted for all GIS users, even those who have had some training. This training would be conducted in Anchorage by an organization such as Mapping Solutions, which has had experience working with tribes on GIS projects and issues. This training would incorporate datasets from Alaska and expressly from the Chugachmiut region whenever possible, and the training would focus specifically on those skills that the village GIS specialist would need to get their village program underway. This would give all individuals experience with datasets that they will actually use in their village programs. Often times commercial GIS training programs use datasets from outside of Alaska, such as ATM locations in Atlanta, Georgia, which have no relevance to the needs of village Alaskans. Additionally, the training would introduce the village GIS specialist to four important topics:

   a. The diverse ways that GIS could be applied to issues, problems, or questions within the villages. GIS has many uses beyond natural resources and general planning, but these issues are rarely pointed out to beginning users.

   b. The course would cover the importance and establishment of GIS standards for measurements and data collection that would apply on a Region-wide basis, which allows for accurately collecting and easily sharing data with others.

   c. Application of GPS to village data collection and incorporating GPS data into the GIS database—there are some pitfalls here and the village GIS specialists would learn to avoid these.

   d. Considerable attention would be given to GIS mapping issues specific to Alaska Native villages, such as subsistence and local knowledge

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mapping, security and sharing of sensitive data, and how young people can be incorporated into GIS mapping and data collection projects.

13. Following the training, a Mapping Solutions staff person or other trainer should go to each of the villages and help the village GIS specialist set up the software and datasets on his or her computer so that the configuration and organization are uniform throughout the region. This uniformity would assist in troubleshooting when the need arises. The trainer and village GIS specialist can assure that everything is operational and all datasets and other information can be located. This will keep people from running into frustrating problems, albeit simple ones, that can hinder the process of becoming operational.

14. Further, when the village has a specific project waiting the application of GIS, the trainer could help the village GIS specialist get started on this task. Often times the first steps into a project are the most difficult, so some mentoring by the trainer would assure a smooth launch of the villages' GIS programs.

15. A region-wide GIS position should be established in Chugachmiut, and this position would function to produce GIS products for the corporation, oversee GIS data storage in the Corporation's blade server, which would be made available to villages to assist in their data storage and security, acquire and provide datasets that would be of help to the villages and CRRC, and function as a GIS mentor for the village GIS specialist. As a GIS mentor, this individual could help village specialists with troubleshooting of GIS programs, provide advice on GIS issues and formulate and cooperate on specific GIS projects of region-wide interest and importance. Additionally, the region-wide GIS person would assure that the GIS standards are established and adhered to by all persons gathering GIS data for the villages and Corporation. Finally, this region-wide GIS specialist could arrange:
    o annual or biannual training workshops where all GIS specialists get together on a regular basis to enhance their GIS skills and deal with issues of mutual interest.
    o training for new GIS specialists when new people become involved in the GIS program.

MAPPING SOLUTIONS ASSESSMENT OF TATITLEK

1. Some of the residents Tatitlek understand and show a level of interest for adopting and using GIS. They recognized a number of potential applications of GIS and the village IRA Council's publication "Native Village of Tatitlek, Tribal Natural Resource Management Plan" identified additional uses. However, a GIS Technical Survey was not prepared by the village.

2. GIS infrastructure information is lacking without a survey response. A quick visual survey of computers indicated that it would be best for a new computer to be acquired for GIS operations.

3. One Tatitlek resident has been trained in GIS; however, this person's GIS skills are rusty. He did not feel competent enough to launch into GIS without some additional training. He would benefit by retaking the Chugachmiut/CRRC-wide GIS training followed with mentoring in the set up and organization of individual village GIS systems. Unfortunately, this individual is currently involved in a significant number of other village administrative and management activities, and he probably would not have sufficient time to devote to GIS.

4. In order to establish a GIS in Tatitlek, we recommend that another individual be identified, trained, and mentored to facilitate the process of becoming an operational GIS program.

5. Villagers were concerned with how GIS would be funded, supported, personnel trained, acquisition of hardware and software, and where GIS would fit in the village administrative hierarchy. These are real concerns for any entity beginning a GIS program, but most of the issues could be easily worked through with some mentoring from Chugachmiut, CRRC, or Mapping Solutions' personnel and some minimal additional funding. Additionally, Chugachmiut or CRRC staff could help the village write an initial grant to support GIS and then encourage the villages to write GIS into all grant proposals to help continue to fund GIS endeavors. The mentoring process will be particularly important for the Village of Tatitlek if they want to be part of Region-wide GIS endeavor.

MAPPING SOLUTIONS COMMENTS TO THE VILLAGERS OF TATITLEK

Our report on the ideas and concerns of Tatitlek about GIS is based on our notes taken during the meeting and the surveys submitted by village residents. If we have not expressed your feelings correctly or clearly enough, or if you have developed different or additional ideas or concerns, please send them to Mapping Solutions so they we can have a complete and correct record of the ideas of the residents of Tatitlek.

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Last but certainly not least, we would like to thank the residents of Tatitlek for the help and hospitality you showed us on our visit. We greatly enjoyed visiting your beautiful and friendly village and meeting and talking with you. We look forward to coming back to see you again and spending a longer time.

TATITLEK VILLAGERS' IDEAS
Tatitlek Survey Results for GIS Usage (n=3)

- Natural resources:
    - yes

- Cultural resources:
    - yes
- Environmental issues:
    - yes

- Village planning:
    - Yes

- Infrastructure
    - Yes

- Education benefits:
    - Familiarize youth with area and traditional use
    -

Other comments:
    Make information available for general use

Data need to be collected carefully
Do interviews and look at existing state and federal data