J

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF FLORIDA

CBS Broadcasting Inc. et al.

Plaintiffs,

v.

Case No. 98-2651-CIV-NESBITT
Magistrate Judge Johnson

EchoStar Communications Corporation
d/b/a DISH Network et al.,

Defendants.
_____/

DECLARATION OF JULES COHEN

1. My name is Jules Cohen. I have been a professional engineer with particular emphasis in the fields of broadcasting and signal propagation since the end of 1945 upon my release from active duty as a commissioned officer in the United States Navy. I was awarded the degree of Bachelor of Science in Electrical Engineering by the University of Washington (Seattle) in 1938. My initial employment in the field of broadcasting was as a Senior Engineer in the consulting firm of Weldon and Carr. Since 1952, I have been either a sole practitioner, partner or officer of a firm in consulting practice. My testimony as a qualified professional engineer has been accepted by Federal and State courts, including by this Court in CBS Broadcasting Inc. et al. v. PrimeTime 24 Joint Venture (CIV-Nesbitt-96-3650) (the "PrimeTime 24 suit"), as well as by the Federal Communications Commission ("FCC") and various local boards. I hold professional engineer licenses issued by the District of Columbia, the

location of my office, and by the Commonwealth of Virginia, the place of my residence. I am a Life Fellow in both the Institute of Electrical and Electronics Engineers and the Society of Motion Picture and Television Engineers. I am a member of the National Society of Professional Engineers and the American Association for the Advancement of Science. I was elected to membership in Tau Beta Pi, the engineering scholastic honorary society. I received the 1988 Engineering Achievement Award of the NAB and the 1992 Engineering Achievement Award of the Broadcast Pioneers, Washington Chapter.

2. I have been asked by counsel for the plaintiffs in the above-captioned action to supervise the creation of maps designed to assess whether, and to what extent, EchoStar is violating the requirements of the Satellite Home Viewer Act ("SHVA" or "the Act").

3. To illustrate EchoStar's pattern of service on a national basis, I have supervised the generation of maps for thirty-five randomly-selected television stations located in markets across the United States. A list of the stations mapped is included as Exhibit A. Copies of the maps are included as Exhibit B. I understand that the process of selecting the thirty-five stations to be mapped was directed by Professor Seymour Sudman, a statistician. The maps generated are for: (1) an ABC, CBS, Fox, or NBC station in each of the top 15 Defined Market Areas ("DMAs") in the country; (2) fifteen randomly-selected stations in DMAs 16 through 100; and (3) five randomly-selected stations in DMAs 101 through 211. Where applicable, service provided by translators or satellite stations, which extend a station's coverage, is included together with the service provided by the "mother" station. (Because the lists of EchoStar subscribers receiving NBC are not currently available, the enclosed maps show only EchoStar subscribers

receiving ABC, CBS, and Fox. I plan to submit a supplemental report with the NBC maps as soon as those data become available.)

4. As with the maps that I had created for the PrimeTime 24 suit, each map created for this litigation shows three things: (1) the station's traditional FCC contours (both A and B); (2) the predicted propagation coverage area (both Grade A and Grade B) as generated by the Longley-Rice model run in the standard manner specified by the FCC and by this Court in its July 10 preliminary injunction;[1] and (3) the locations of EchoStar subscribers included in lists provided by EchoStar's subsidiary, Satellite Communications Operating Corporation, to ABC, CBS, or Fox during October 1998. As with the preparation of maps in the PrimeTime 24 case, subscriber locations by geographic coordinates were first obtained for as many subscribers as possible. To insure maximum accuracy, this geocoding process was done only for subscribers whose addresses could be identified with a high level of precision (and not, for example, for those who provided only a Post Office box address). Then, with the aid of a computer program, those coordinates were employed to plot the subscriber locations on the maps. Comparison of the plotted locations of subscribers with the Longley-Rice predicted signal coverage areas for the corresponding stations provides a ready source for predicting the number of EchoStar subscribers

[1]In the expert reports that I submitted in the PrimeTime 24 case, I described the Longley-Rice propagation model and the FCC's procedure for running Longley-Rice to predict propagation areas for analog television stations as well as the process of geocoding. Briefly, the FCC specified in its proceedings regarding conversion to digital television that the Longley-Rice model should be run using a 50 percent time variability factor, a 50 percent location variability factor, a 50 percent confidence level, and an assumed 30-foot receiving antenna. For the convenience of the Court, I have attached my original expert report to this Declaration as Exhibit C, and my supplemental expert report as Exhibit D. These reports contain a full discussion of the pertinent engineering issues.

that are more likely than not to receive a signal in excess of Grade B strength and that are therefore more likely than not to be ineligible for delivery of network stations by direct broadcasting from satellite.

5. The maps are designed to show the locations of EchoStar subscribers who are either (a) within the predicted FCC Grade A or Grade B contours of the station being mapped, and/or (b) within the predicted Longley-Rice Grade A or Grade B signal intensity area for the station.

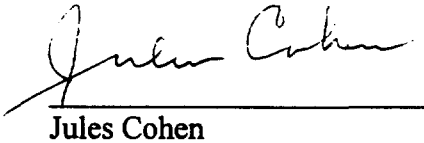
6. Review of the maps shows that large numbers of new EchoStar subscribers are located in areas where the relevant CBS, ABC, or Fox station has predicted field intensity, using a Longley-Rice analysis, in excess of Grade B. In particular, Longley-Rice propagation maps for the 25 randomly selected ABC, CBS, and Fox television stations in markets throughout the United States show that more than 80% of EchoStar's subscribers within FCC predicted Grade B contours of most stations are likely ineligible. Indeed, as these maps show, the majority of EchoStar's subscribers are predicted to receive the much stronger Grade A signal.

7. There is a very high correlation between Longley-Rice predictions of service and the actual field grade intensity present at a given location. In my work as an expert in the PrimeTime 24 case, I compared the results of actual signal intensity testing carried out under my supervision in the case with the Longley-Rice predictions generated for each of the households tested. By making this comparison, I was able to calculate the "success rate" for Longley-Rice predictions -- using Longley-Rice run in the standard manner -- in five different markets, Miami,

Charlotte, Pittsburgh, Baltimore, and Raleigh/Durham. In each case, the success rate was very high. In four of the markets (Miami, Charlotte, Baltimore, and Raleigh/Durham), the success rate was at least 94%, and in three (Miami, Charlotte, and Raleigh-Durham) the success rate was 99% or 100%. In Pittsburgh, where I had tested the signal intensity of a UHF station in extremely difficult terrain as a "worst case" scenario, the success rate for Longley-Rice was 73%. In my professional opinion, this evidence confirms that Longley-Rice, run in the standard manner, is an excellent predictor of whether a given household receives a signal of Grade B intensity. Accordingly, the enclosed maps enable one to conclude with a high degree of confidence that the great majority of EchoStar subscribers are in fact able to receive signals of Grade B intensity from their local ABC, CBS, and Fox stations.

I hereby declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed on November 30, 1998.

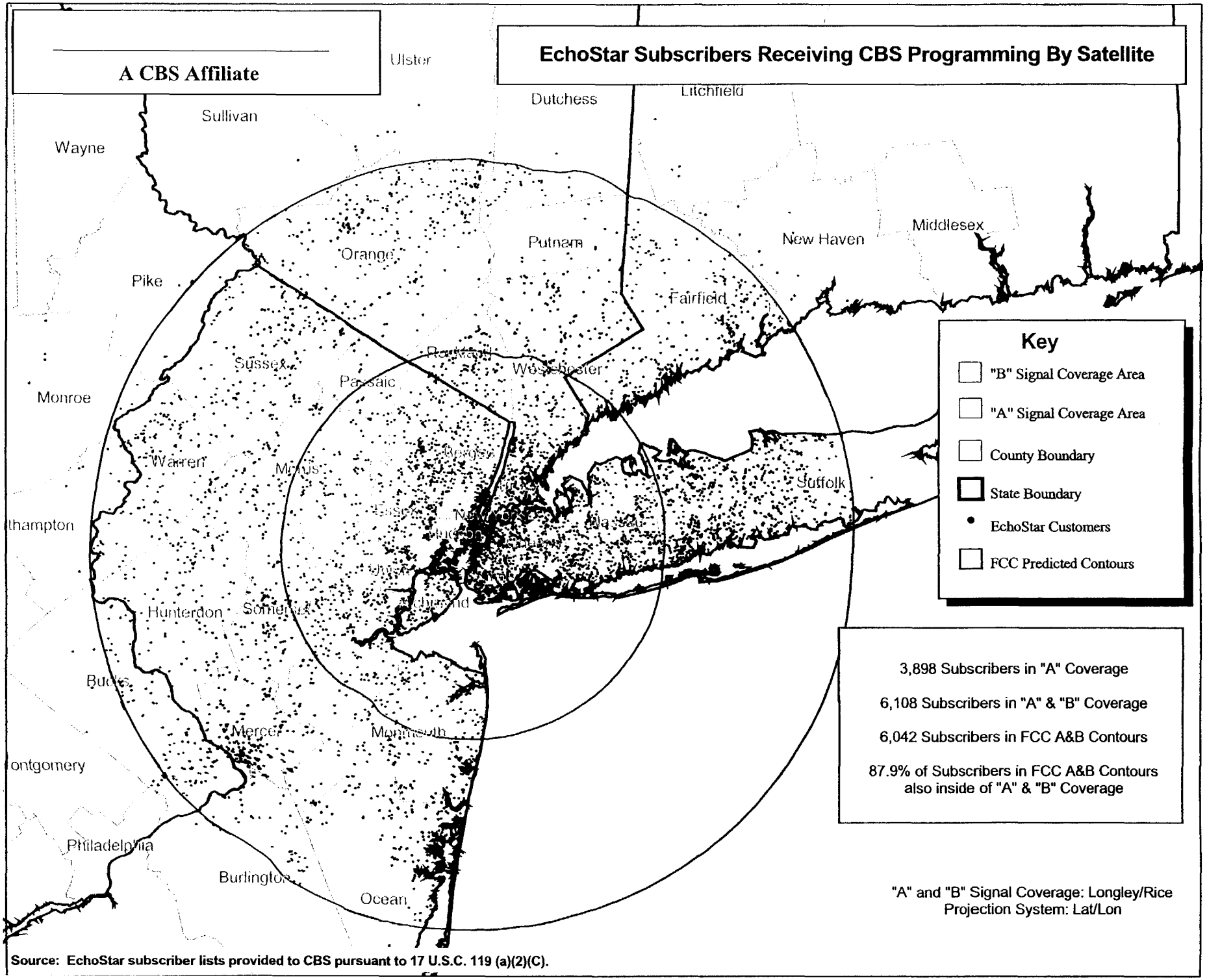


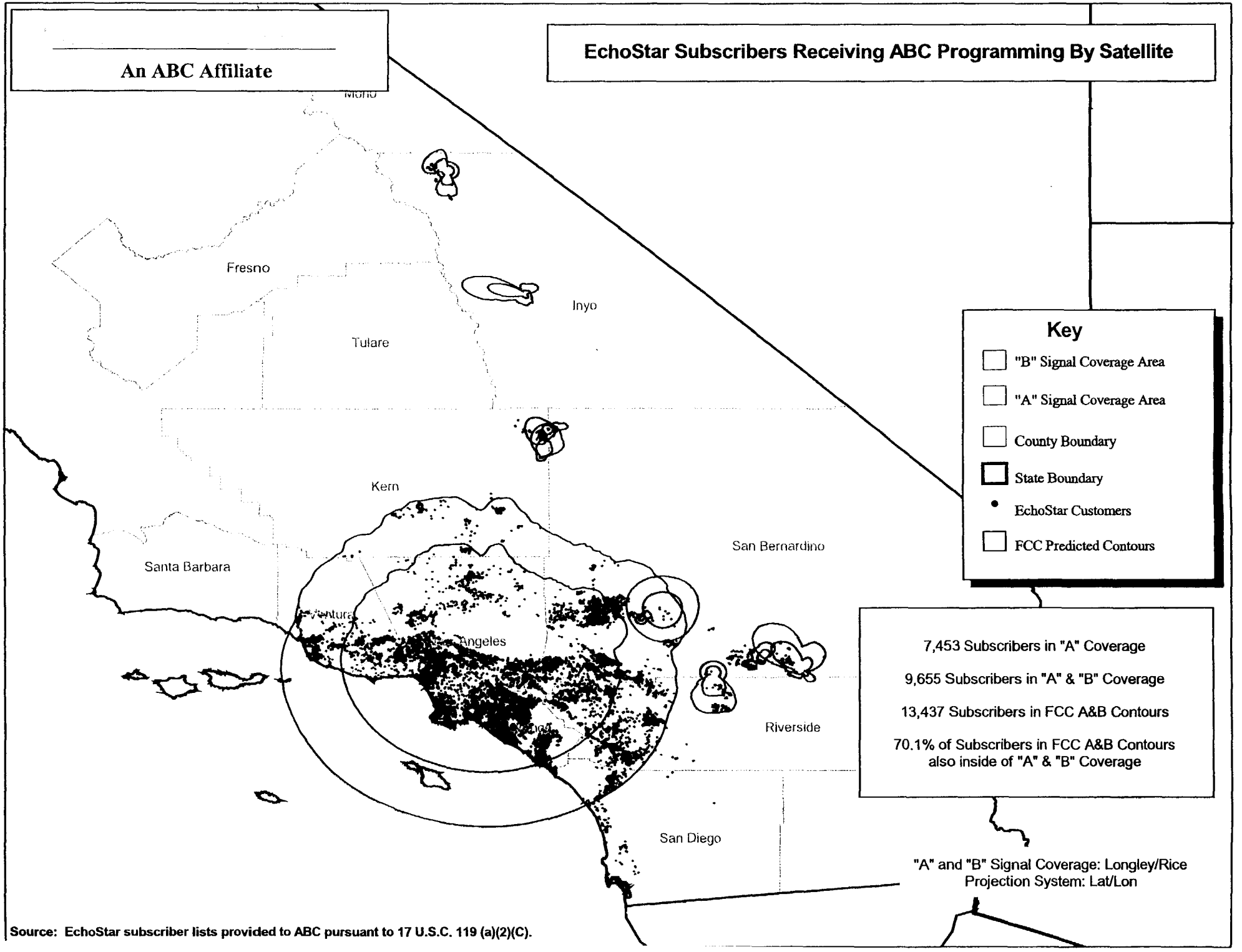
Jules Cohen

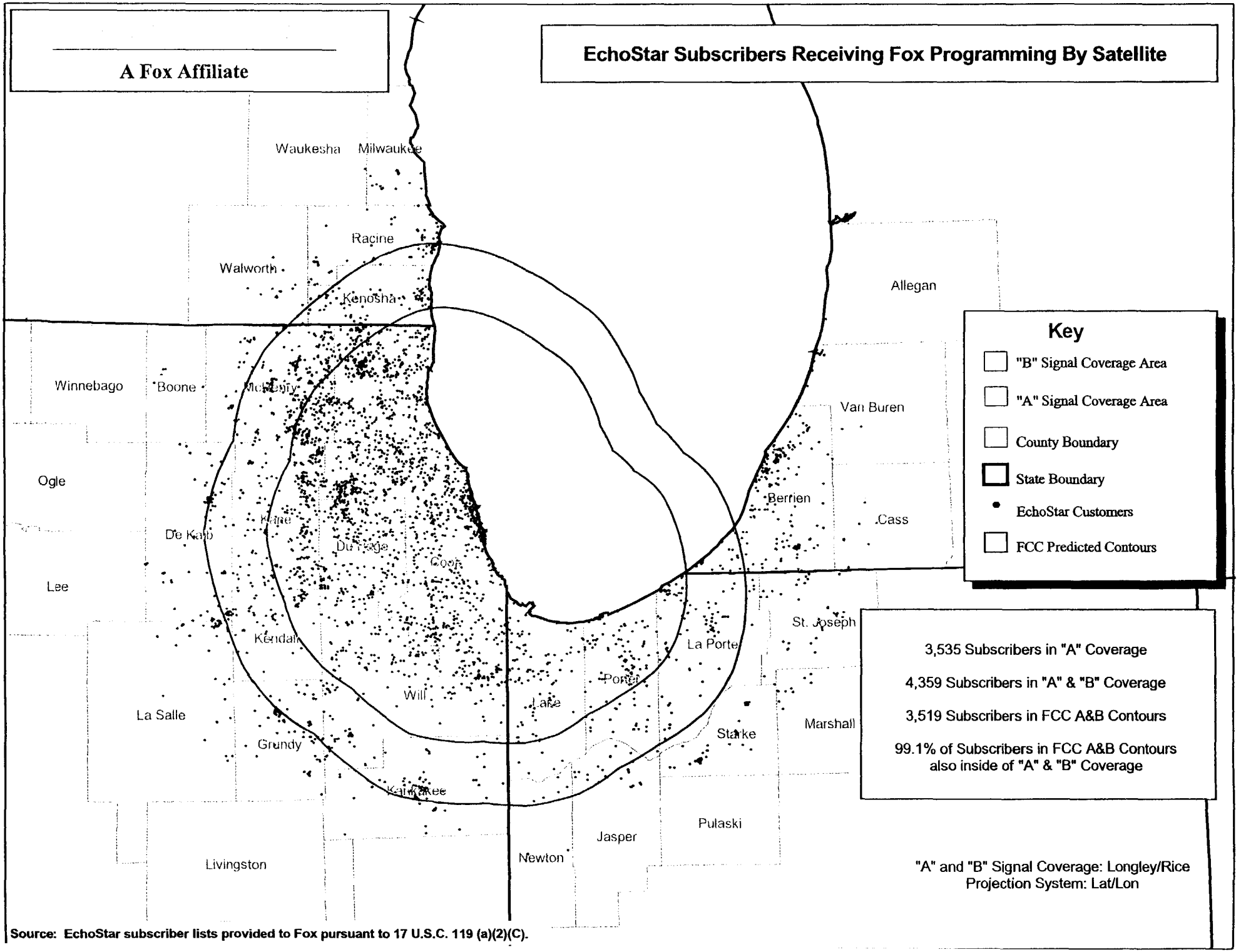
Echostar Maps (CBS v. EchoStar)

DMA Rank	Market	Network	Station
1	New York, NY	CBS	WCBS-TV(2)
2	Los Angeles, CA	ABC	KABC-TV(7)
3	Chicago, IL	Fox	WFLD(32)
4	Philadelphia, PA	NBC	WCAU(10)
5	San Francisco-Oakland-San Jose, CA	CBS	KPIX-TV(5)
6	Boston, MA	ABC	WCVB-TV(5)
7	Washington, DC	Fox	WTTG(5)
8	Dallas-Fort Worth, TX	NBC	KXAS-TV(5)
9	Detroit, MI	CBS	WWJ-TV(62)
10	Atlanta, GA	ABC	WSB-TV(2)
11	Houston, TX	Fox	KRIV(26)
12	Seattle-Tacoma, WA	NBC	KING-TV(5)
13	Cleveland, OH	CBS	WOIO(19)
14	Minneapolis-St Paul, MN	ABC	KSTP-TV(5)
15	Tampa-St. Petersburg-Sarasota, FL	Fox	WTVT(13)
17	Phoenix, AZ	NBC	KPNX(12)
22	Orlando-Daytona Beach-Melbourne, FL	CBS	WCPX-TV(6)
27	Hartford-New Haven, CT	ABC	WTNH-TV(8)
32	Milwaukee, WI	Fox	WITI-TV(6)
37	Grand Rapids-Kalamazoo-Battle Creek, MI	NBC	WOOD-TV(8)
42	Memphis, TN	CBS	WREG-TV(3)
57	Charleston-Huntington, WV	NBC	WSAZ-TV(3)
62	Mobile, AL-Pensacola, FL	CBS	WKRG-TV(5)

DMA Rank	Market	Network	Station
67	Lexington, KY	ABC	WTVQ-TV(36)
72	Syracuse, NY	Fox	WSYT(68)
77	Springfield, MO	NBC	KYTV(3)
82	Huntsville-Decatur-Florence, AL	CBS	WHNT-TV(19)
87	Cedar Rapids-Waterloo-Dubuque, IA	ABC	KCRG-TV(9)
92	Johnstown-Altoona, PA	Fox	WWCP-TV(8)
97	Youngstown, OH	NBC	KFMJ-TV(21)
123	Macon, GA	ABC	WPGA(58)
136	Wausau-Rhinelander, WI	NBC	WJFW-TV(12)
155	Bangor, ME	NBC	WLBZ(2)
171	Missoula, MT	CBS	KPAX-TV(8)
187	Tuscaloosa, AL	ABC	WCFT-TV(33)


A CBS Affiliate
EchoStar Subscribers Receiving CBS Programming By Satellite
Ulster
Sullivan
Wayne
Dutchess
Litchfield
Orange
Putnam
New Haven
Middlesex
Pike
Fairfield
Sussex
Passaic
Monroe
Warren
Suffolk
Hunterdon
Somerset
Bucks
Mercer
Monmouth
Philadelphia
Burlington
Ocean
Key
"B" Signal Coverage Area
"A" Signal Coverage Area
County Boundary
State Boundary
EchoStar Customers
FCC Predicted Contours
3,898 Subscribers in "A" Coverage
6,108 Subscribers in "A" & "B" Coverage
6,042 Subscribers in FCC A&B Contours
87.9% of Subscribers in FCC A&B Contours also inside of "A" & "B" Coverage
"A" and "B" Signal Coverage: Longley/Rice
Projection System: Lat/Lon
Source: EchoStar subscriber lists provided to CBS pursuant to 17 U.S.C. 119 (a)(2)(C).

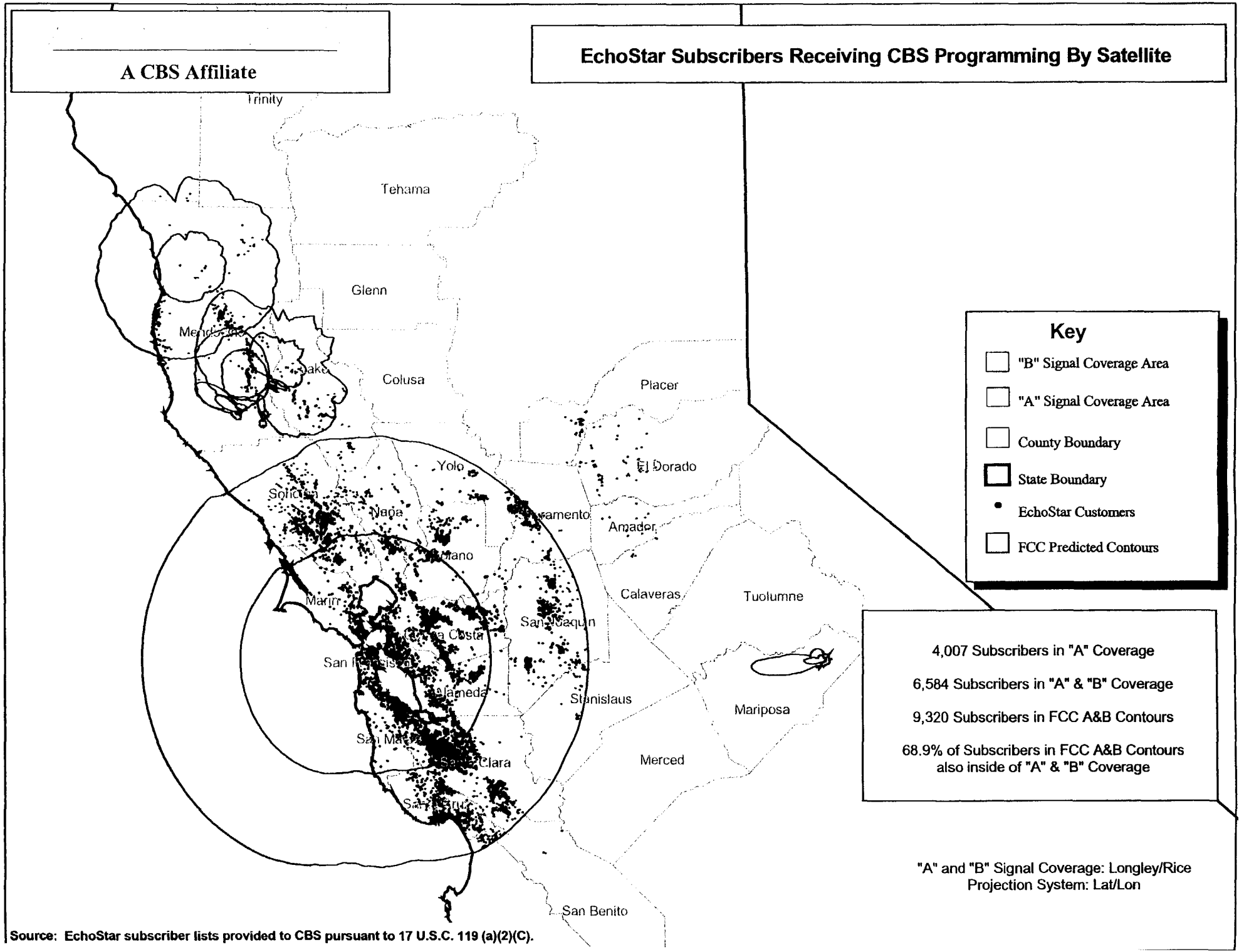

An ABC Affiliate
EchoStar Subscribers Receiving ABC Programming By Satellite
Mono
Fresno
Inyo
Tulare
Kern
Santa Barbara
Ventura
Angeles
San Bernardino
Riverside
San Diego
Key
"B" Signal Coverage Area
"A" Signal Coverage Area
County Boundary
State Boundary
EchoStar Customers
FCC Predicted Contours
7,453 Subscribers in "A" Coverage
9,655 Subscribers in "A" & "B" Coverage
13,437 Subscribers in FCC A&B Contours
70.1% of Subscribers in FCC A&B Contours also inside of "A" & "B" Coverage
"A" and "B" Signal Coverage: Longley/Rice
Projection System: Lat/Lon
Source: EchoStar subscriber lists provided to ABC pursuant to 17 U.S.C. 119 (a)(2)(C).



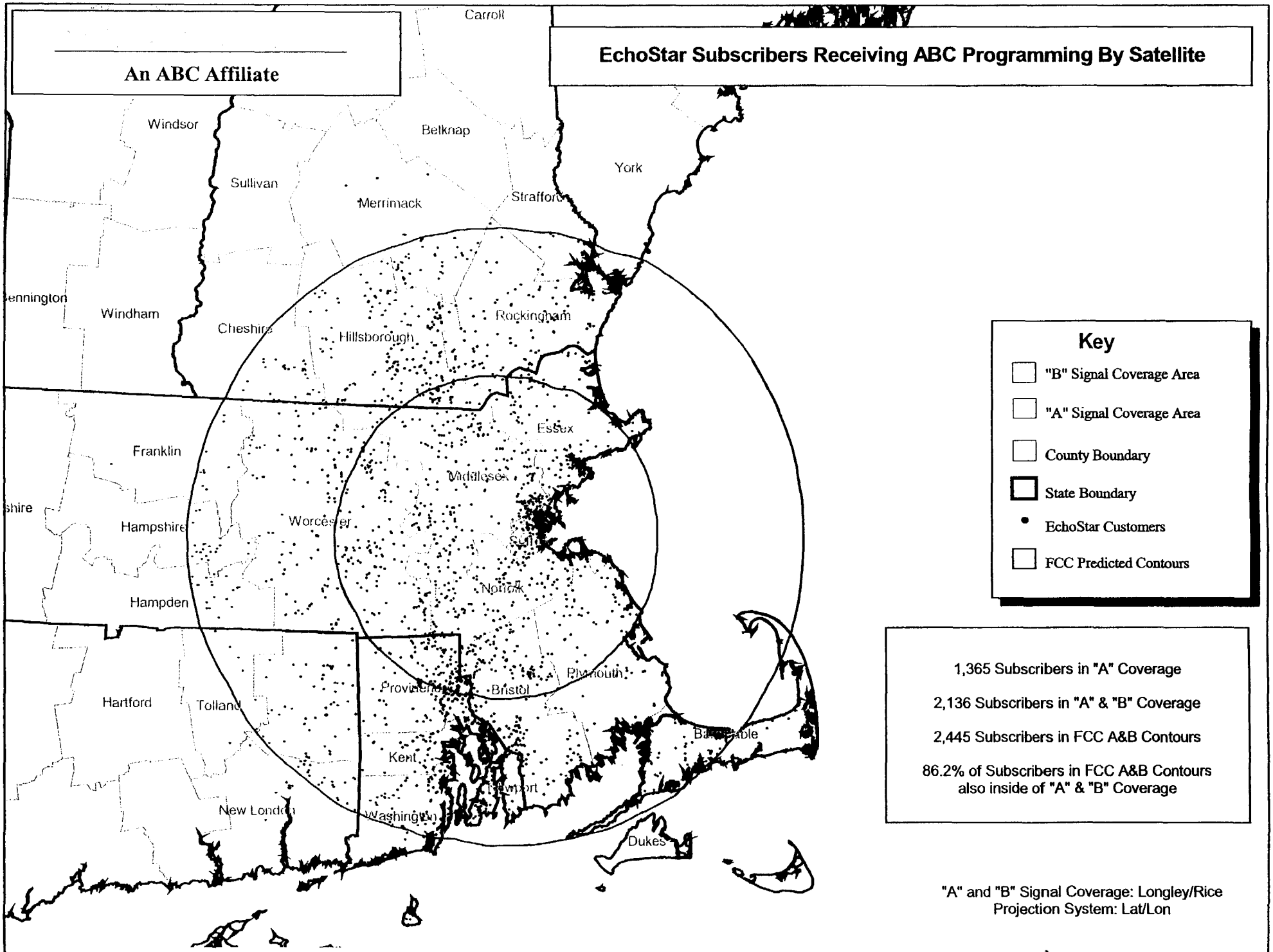
Source: EchoStar subscriber lists provided to Fox pursuant to 17 U.S.C. 119 (a)(2)(C).

A CBS Affiliate

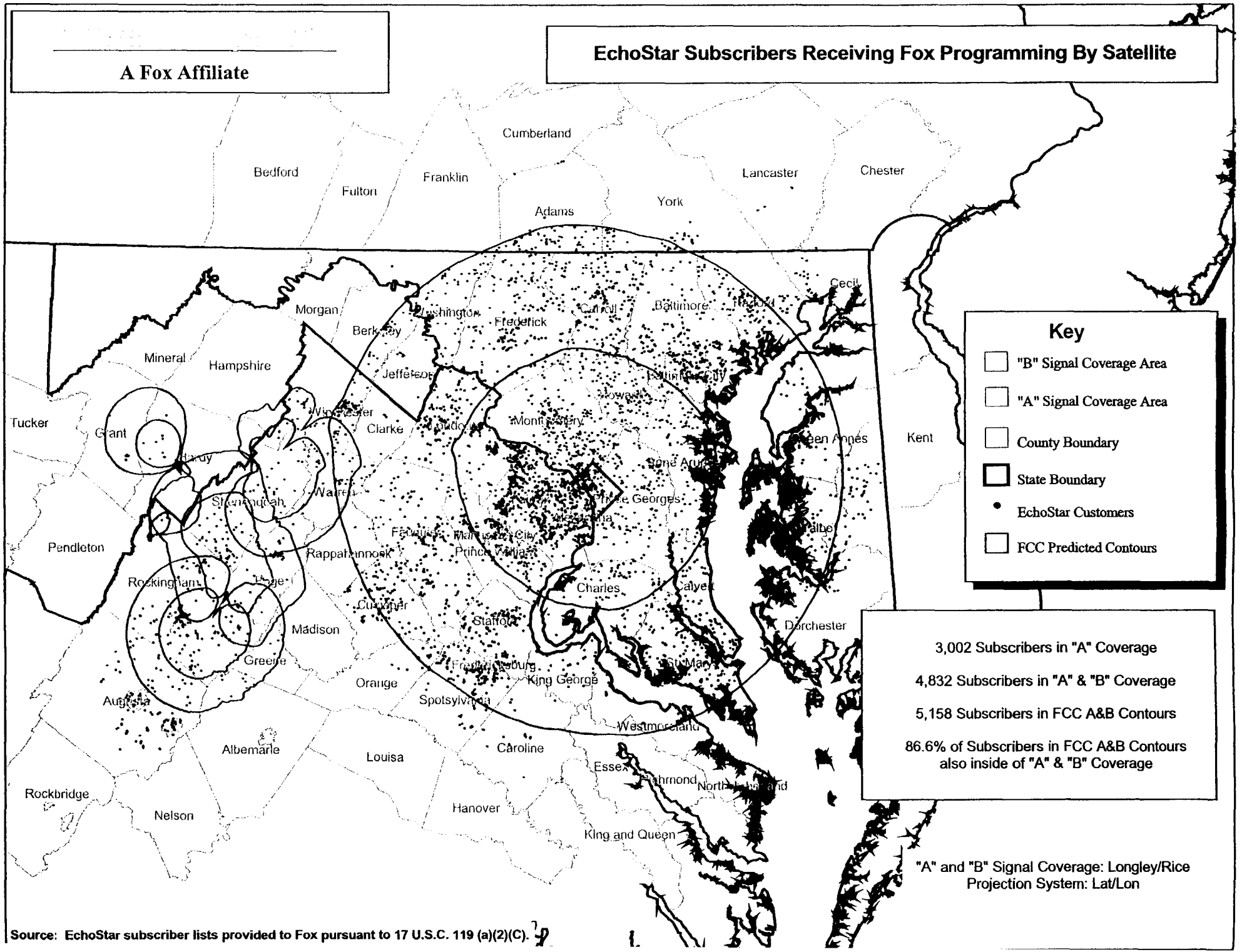
EchoStar Subscribers Receiving CBS Programming By Satellite



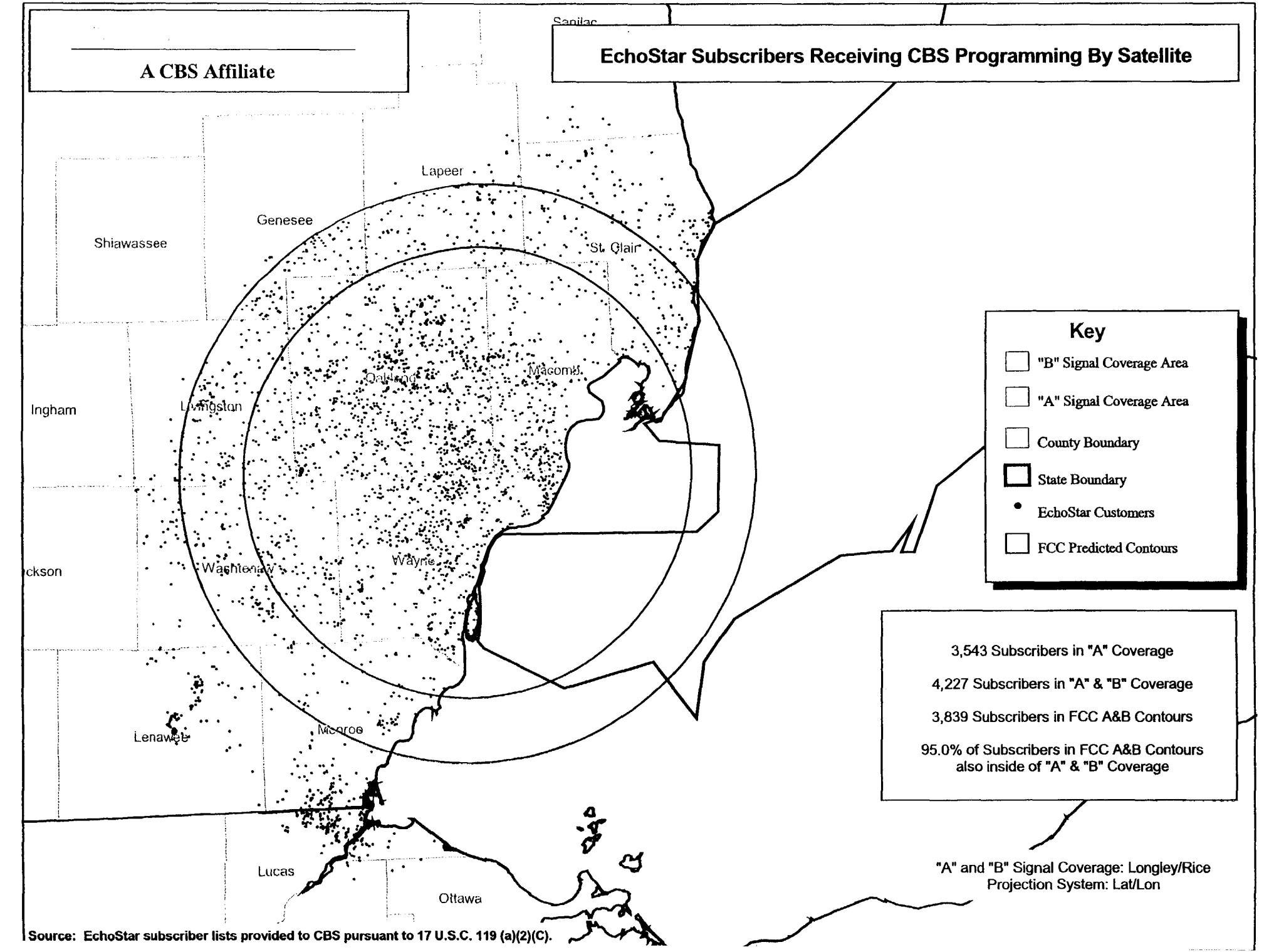
Source: EchoStar subscriber lists provided to CBS pursuant to 17 U.S.C. 119 (a)(2)(C).



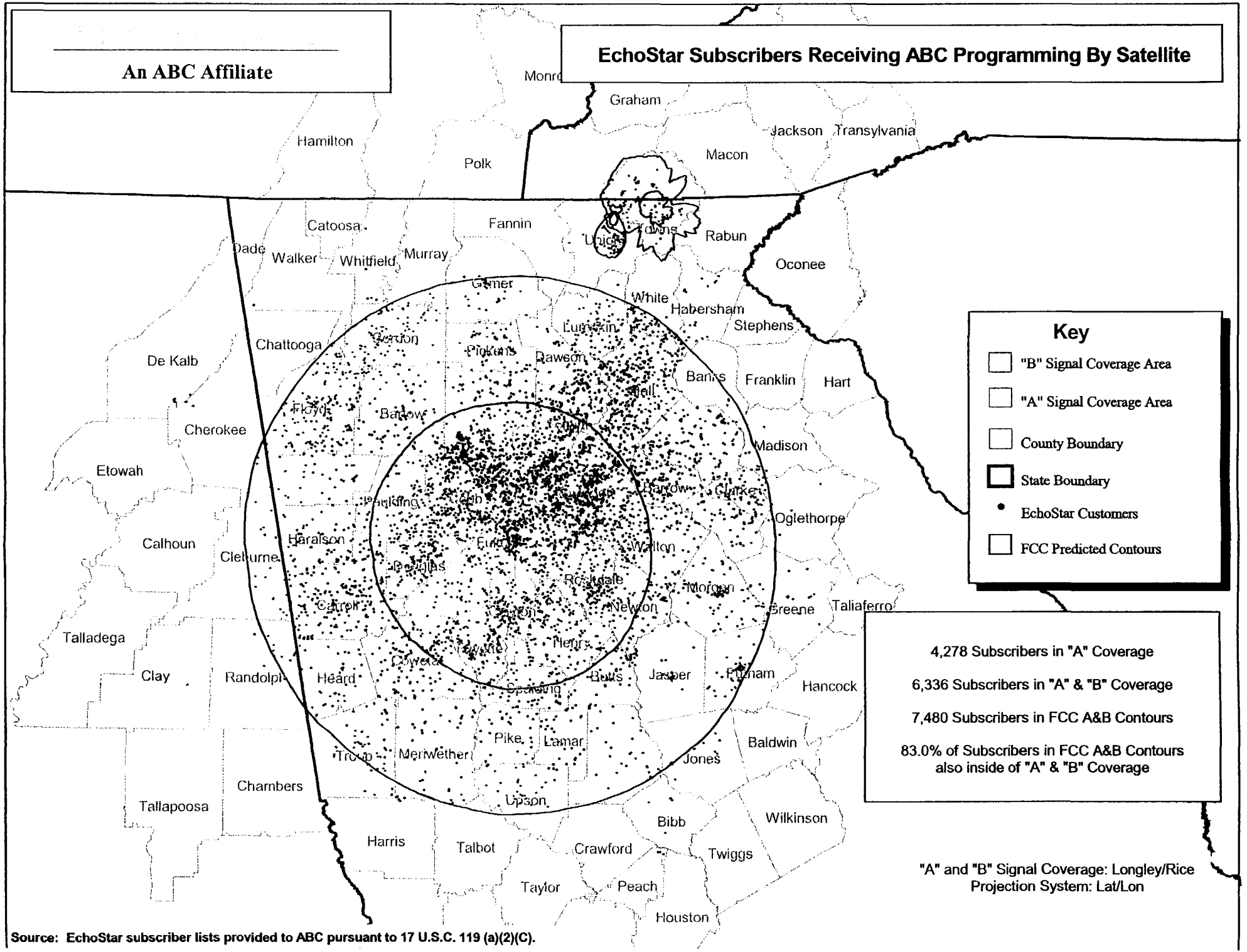
Source: EchoStar subscriber lists provided to ABC pursuant to 17 U.S.C. 119 (a)(2)(C).

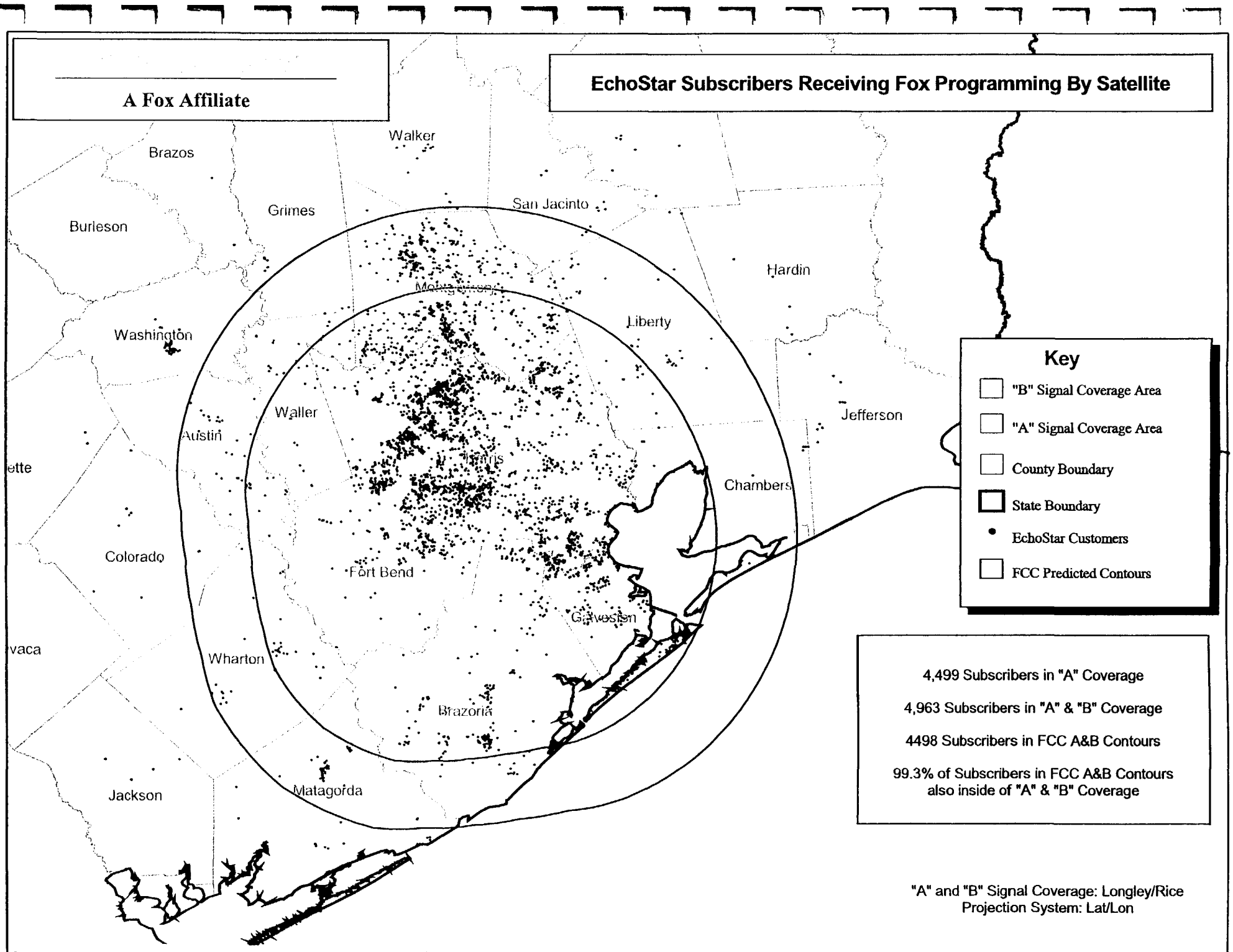


Source: EchoStar subscriber lists provided to Fox pursuant to 17 U.S.C. 119 (a)(2)(C).

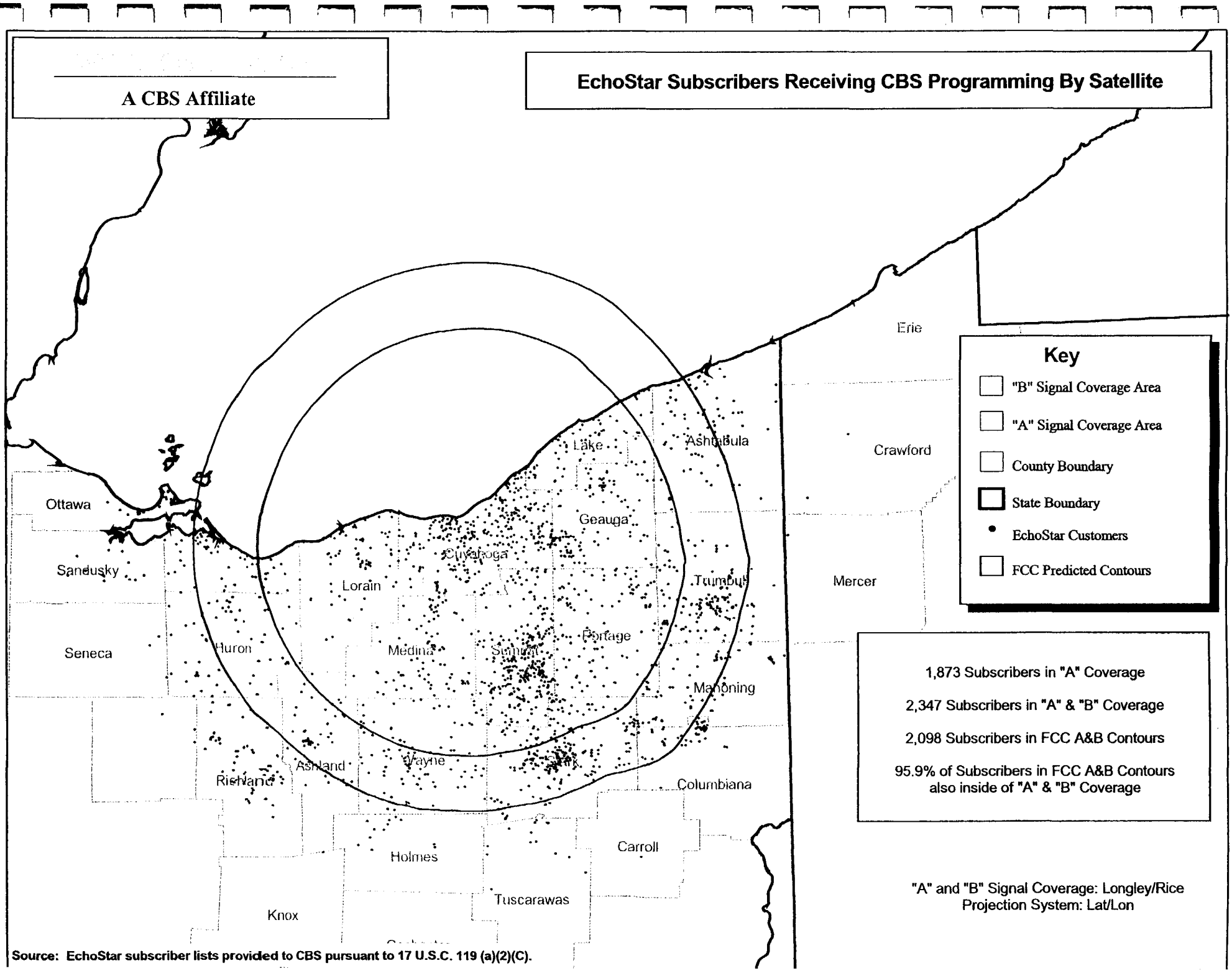


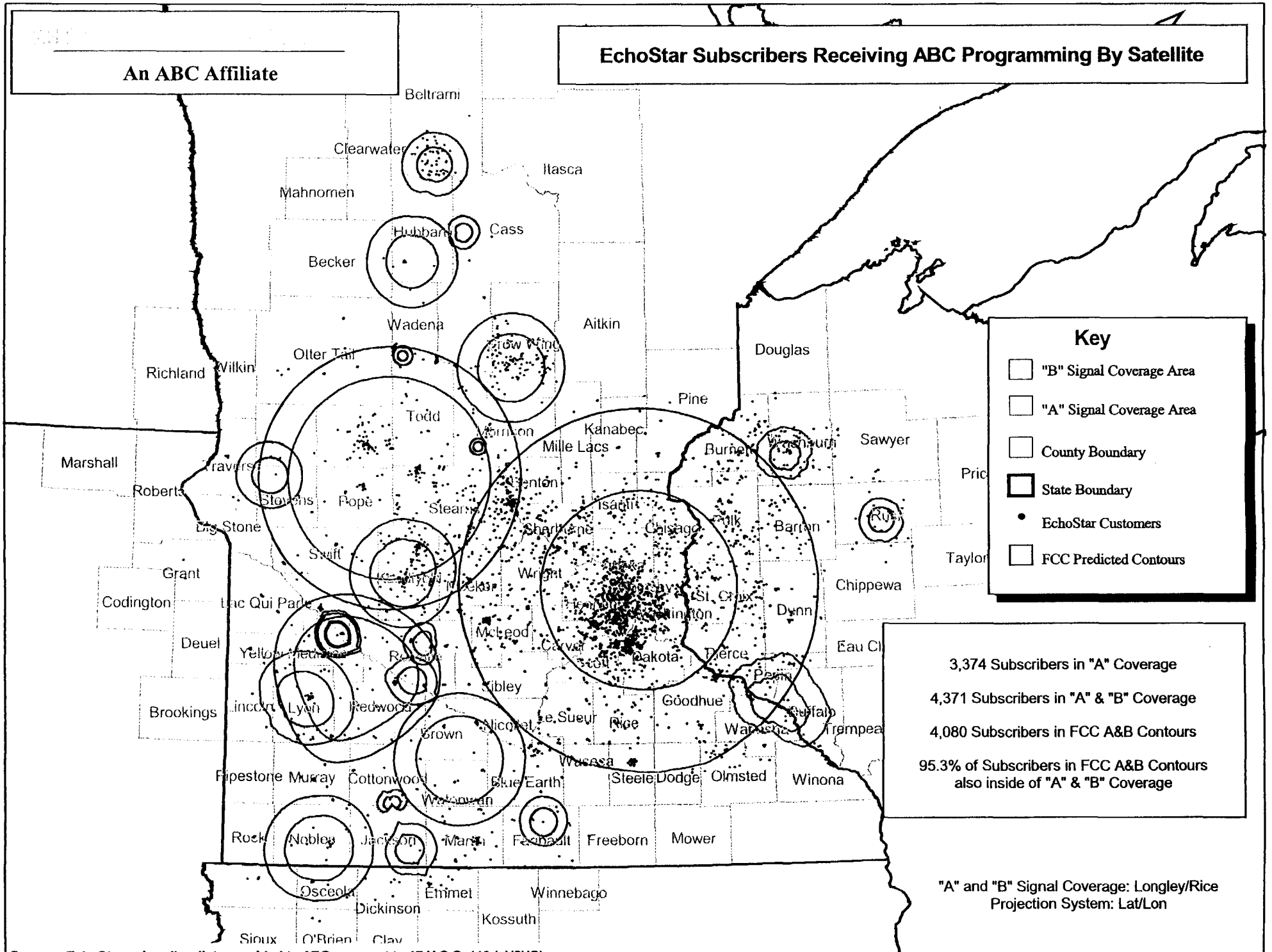
Source: EchoStar subscriber lists provided to CBS pursuant to 17 U.S.C. 119 (a)(2)(C).


An ABC Affiliate
EchoStar Subscribers Receiving ABC Programming By Satellite
Key
"B" Signal Coverage Area
"A" Signal Coverage Area
County Boundary
State Boundary
EchoStar Customers
FCC Predicted Contours
4,278 Subscribers in "A" Coverage
6,336 Subscribers in "A" & "B" Coverage
7,480 Subscribers in FCC A&B Contours
83.0% of Subscribers in FCC A&B Contours also inside of "A" & "B" Coverage
"A" and "B" Signal Coverage: Longley/Rice
Projection System: Lat/Lon
Hamilton
Polk
Graham
Jackson
Transylvania
Macon
Rabun
Oconee
Catoosa
Fannin
Dade
Walker
Whitfield
Murray
Chattooga
De Kalb
Cherokee
Etowah
Calhoun
Cleburne
Talladega
Clay
Randolph
Heard
Chambers
Tallapoosa
Harris
Talbot
Crawford
Taylor
Peach
Houston
Bibb
Twiggs
Wilkinson
Jones
Baldwin
Hancock
Greene
Taliaferro
Oglethorpe
Madison
Franklin
Hart
Stephens
Habersham
White
Banks
Barrow
Clarke
Walton
Morgan
Newton
Jasper
Putnam
Pike
Lamar
Meriwether
Troup
Upson
Harralson
Douglas
Carroll
Haralson
Floyd
Bartow
Gordon
Pickens
Dawson
Lumpkin
Union
Towns
Gilmer
Source: EchoStar subscriber lists provided to ABC pursuant to 17 U.S.C. 119 (a)(2)(C).

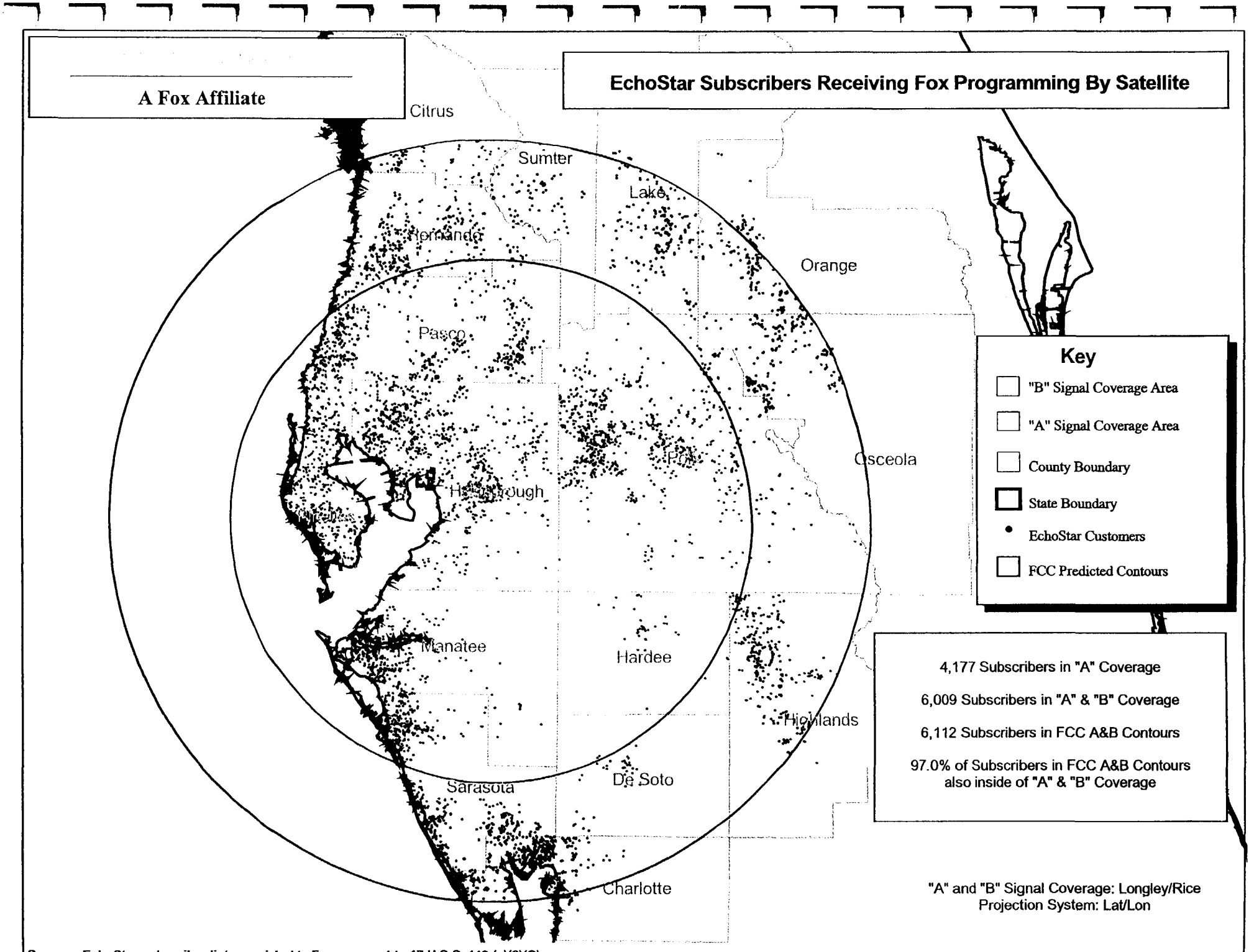


Source: EchoStar subscriber lists provided to Fox pursuant to 17 U.S.C. 119 (a)(2)(C).

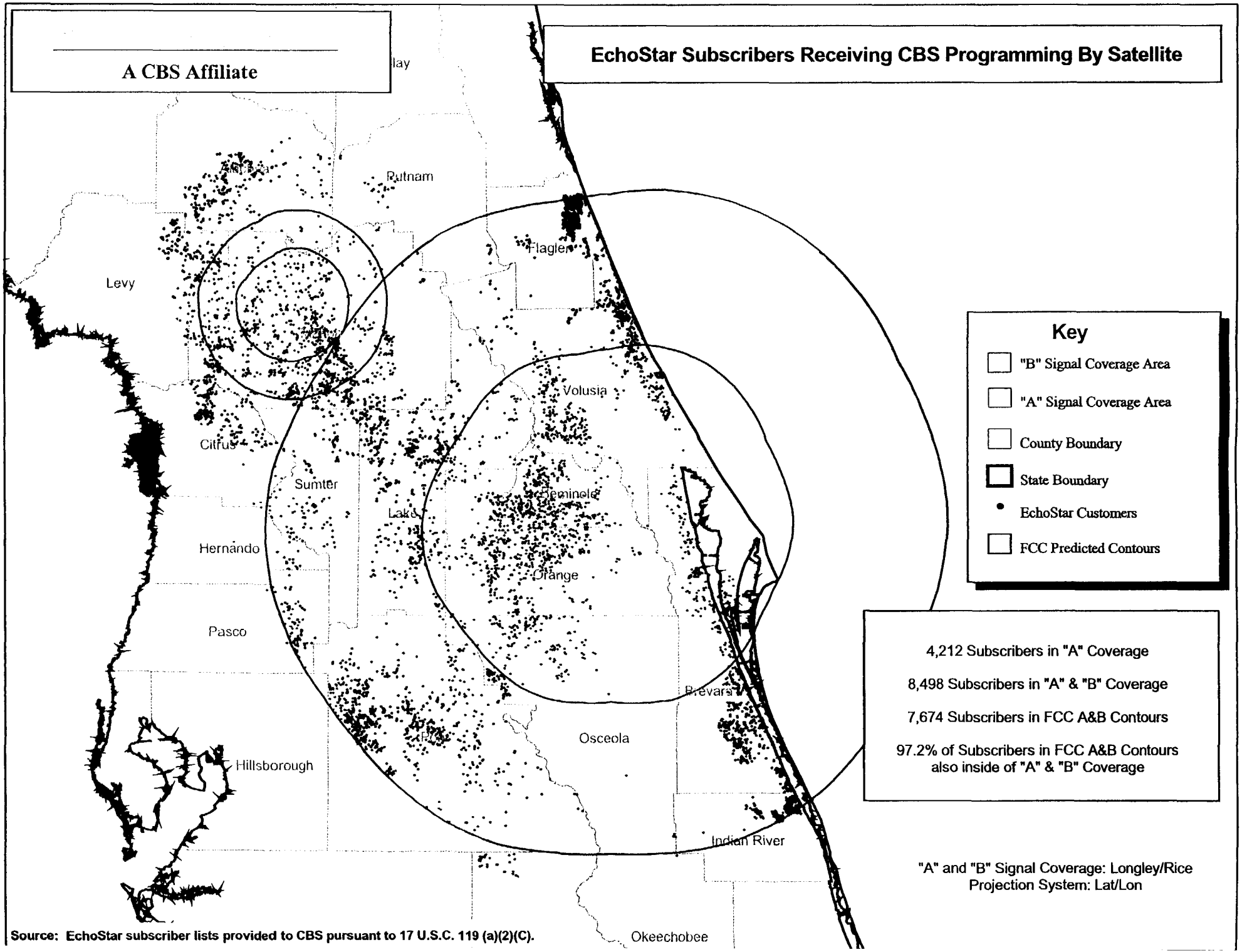

A CBS Affiliate
EchoStar Subscribers Receiving CBS Programming By Satellite
Key
"B" Signal Coverage Area
"A" Signal Coverage Area
County Boundary
State Boundary
EchoStar Customers
FCC Predicted Contours
1,873 Subscribers in "A" Coverage
2,347 Subscribers in "A" & "B" Coverage
2,098 Subscribers in FCC A&B Contours
95.9% of Subscribers in FCC A&B Contours also inside of "A" & "B" Coverage
"A" and "B" Signal Coverage: Longley/Rice
Projection System: Lat/Lon
Source: EchoStar subscriber lists provided to CBS pursuant to 17 U.S.C. 119 (a)(2)(C).
Erie
Crawford
Mercer
Ashtabula
Lake
Geauga
Cuyahoga
Lorain
Trumbull
Portage
Medina
Summit
Mahoning
Ottawa
Sandusky
Seneca
Huron
Richland
Ashland
Wayne
Columbiana
Carroll
Holmes
Tuscarawas
Knox

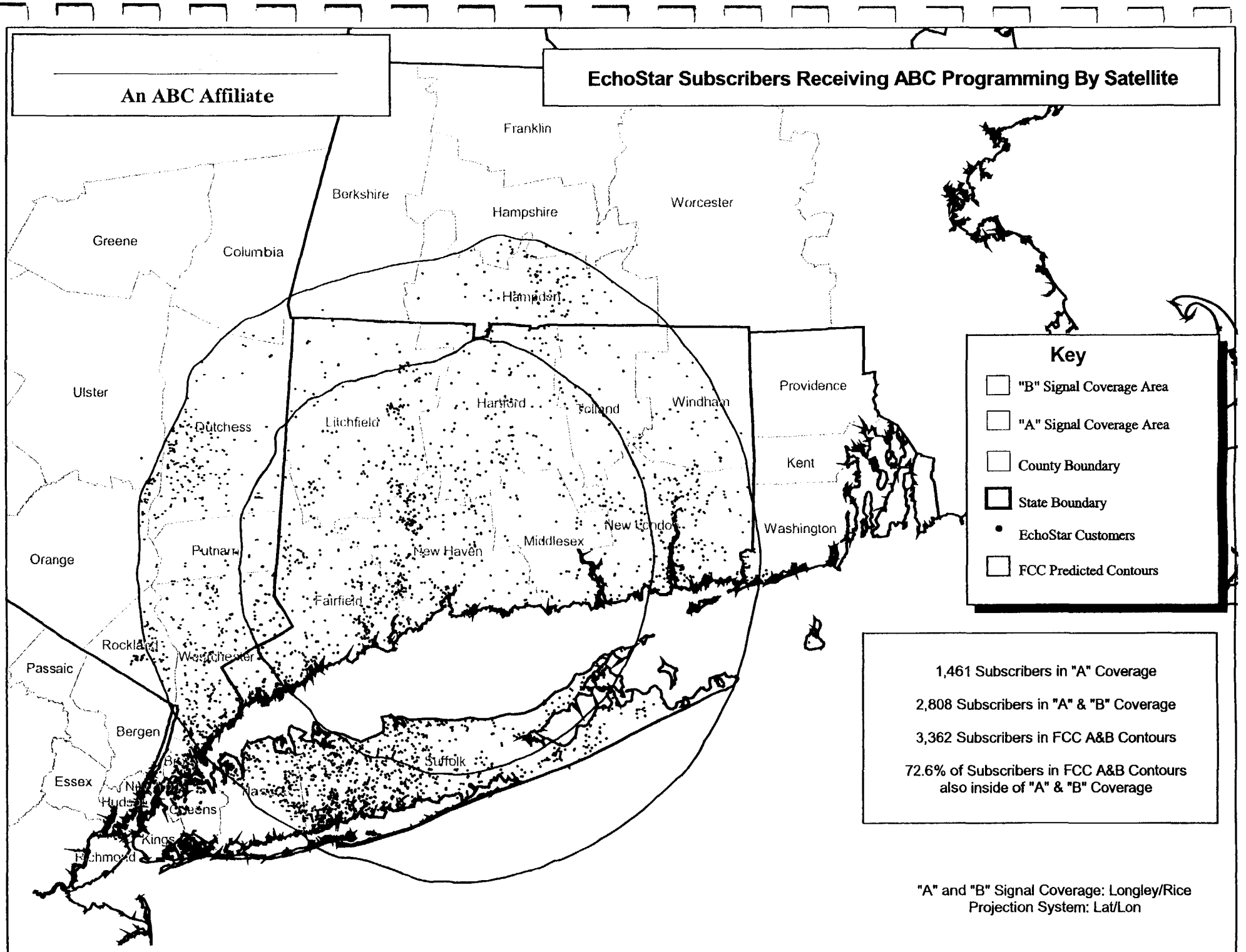


Source: EchoStar subscriber lists provided to ABC pursuant to 17 U.S.C. 119 (a)(2)(C).

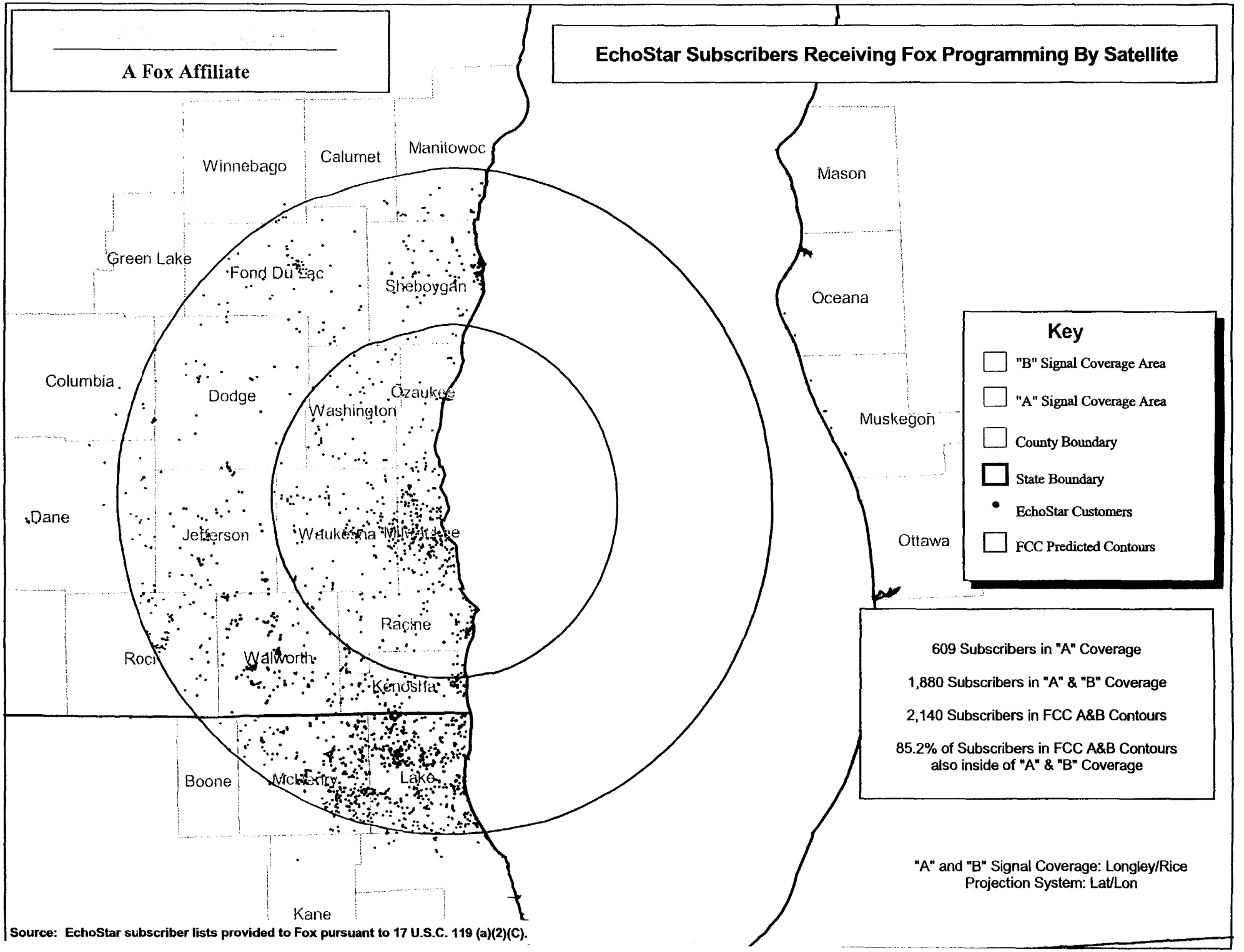


Source: EchoStar subscriber lists provided to Fox pursuant to 17 U.S.C. 119 (a)(2)(C).

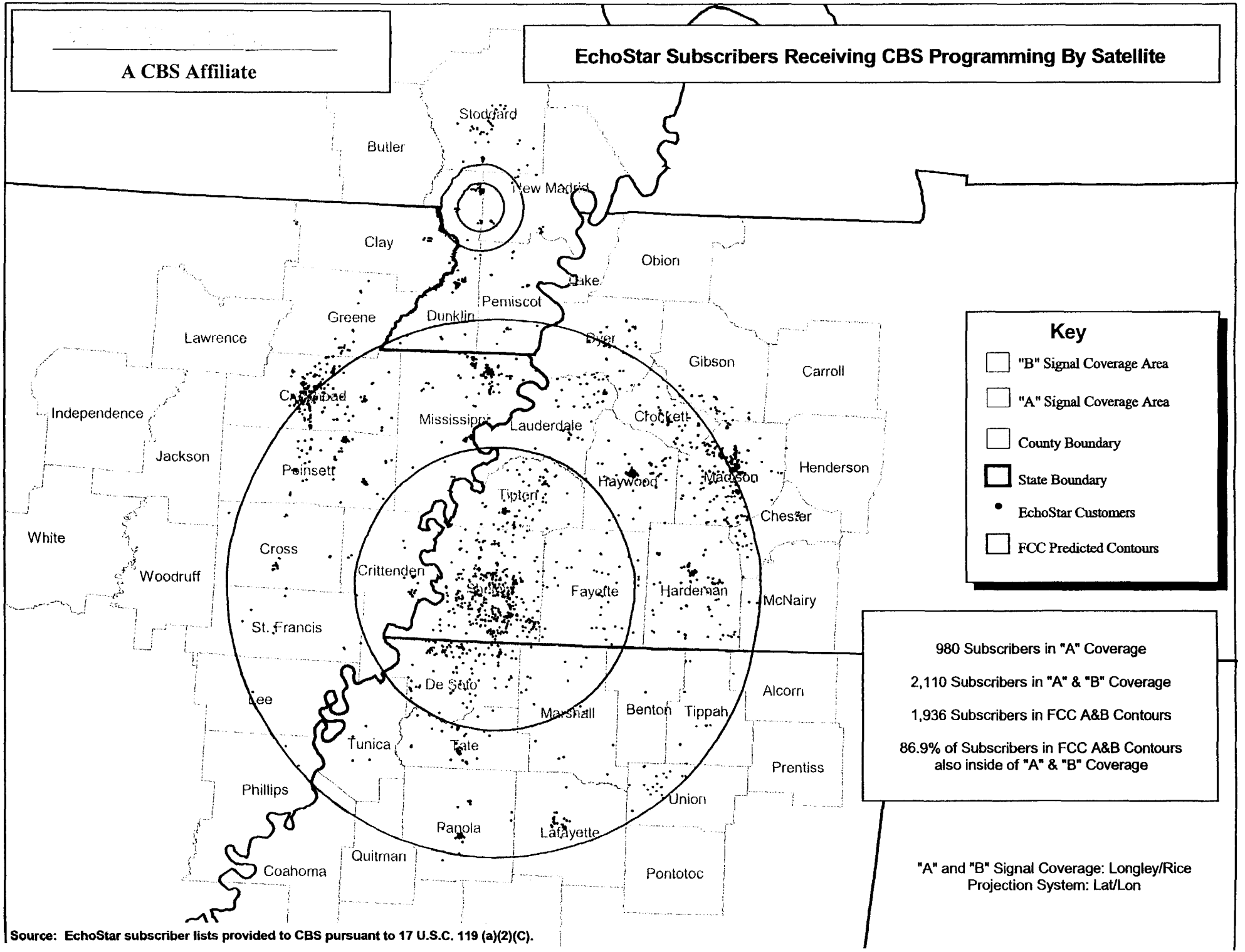

A CBS Affiliate
EchoStar Subscribers Receiving CBS Programming By Satellite
Putnam
Flagler
Levy
Volusia
Citrus
Sumter
Seminole
Lake
Hernando
Orange
Pasco
Brevard
Osceola
Hillsborough
Indian River
Okeechobee
Key
"B" Signal Coverage Area
"A" Signal Coverage Area
County Boundary
State Boundary
EchoStar Customers
FCC Predicted Contours
4,212 Subscribers in "A" Coverage
8,498 Subscribers in "A" & "B" Coverage
7,674 Subscribers in FCC A&B Contours
97.2% of Subscribers in FCC A&B Contours also inside of "A" & "B" Coverage
"A" and "B" Signal Coverage: Longley/Rice
Projection System: Lat/Lon
Source: EchoStar subscriber lists provided to CBS pursuant to 17 U.S.C. 119 (a)(2)(C).



Source: EchoStar subscriber lists provided to ABC pursuant to 17 U.S.C. 119 (a)(2)(C).



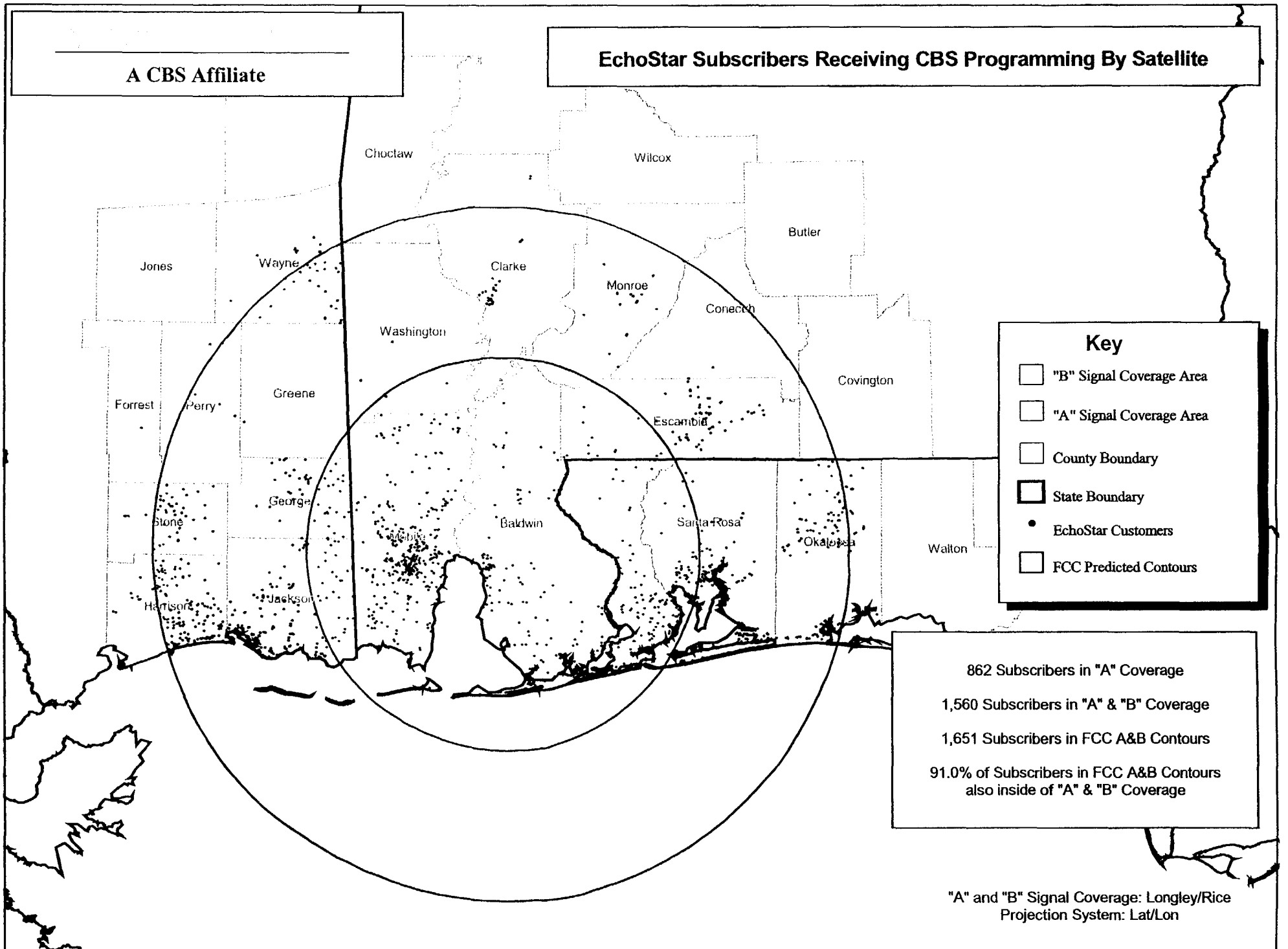
Source: EchoStar subscriber lists provided to Fox pursuant to 17 U.S.C. 119 (a)(2)(C).



Source: EchoStar subscriber lists provided to CBS pursuant to 17 U.S.C. 119 (a)(2)(C).

A CBS Affiliate

EchoStar Subscribers Receiving CBS Programming By Satellite

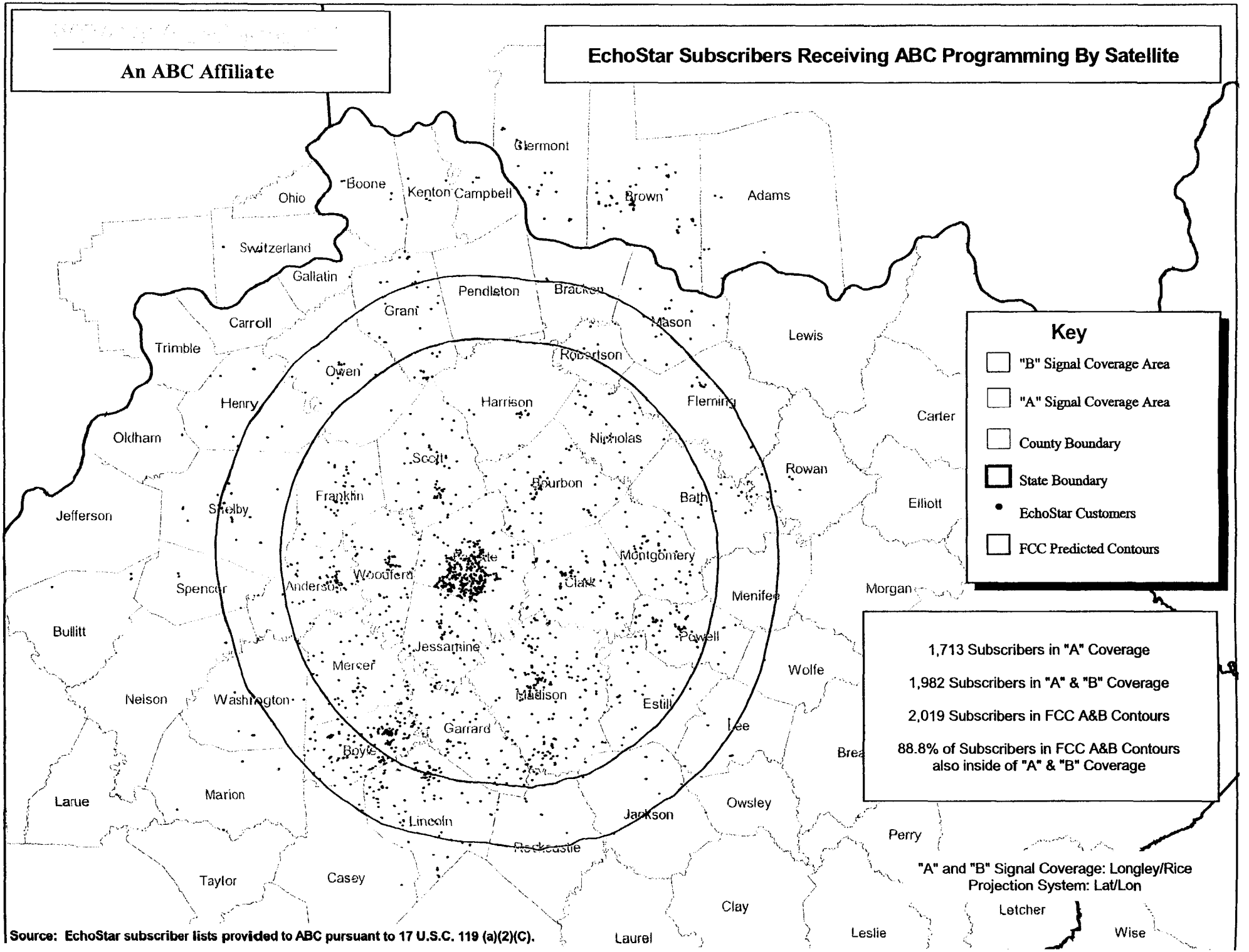


"A" and "B" Signal Coverage: Longley/Rice
Projection System: Lat/Lon

Source: EchoStar subscriber lists provided to CBS pursuant to 17 U.S.C. 119 (a)(2)(C).

An ABC Affiliate

EchoStar Subscribers Receiving ABC Programming By Satellite



Key

- "B" Signal Coverage Area
- "A" Signal Coverage Area
- County Boundary
- State Boundary
- EchoStar Customers
- FCC Predicted Contours

1,713 Subscribers in "A" Coverage

1,982 Subscribers in "A" & "B" Coverage

2,019 Subscribers in FCC A&B Contours

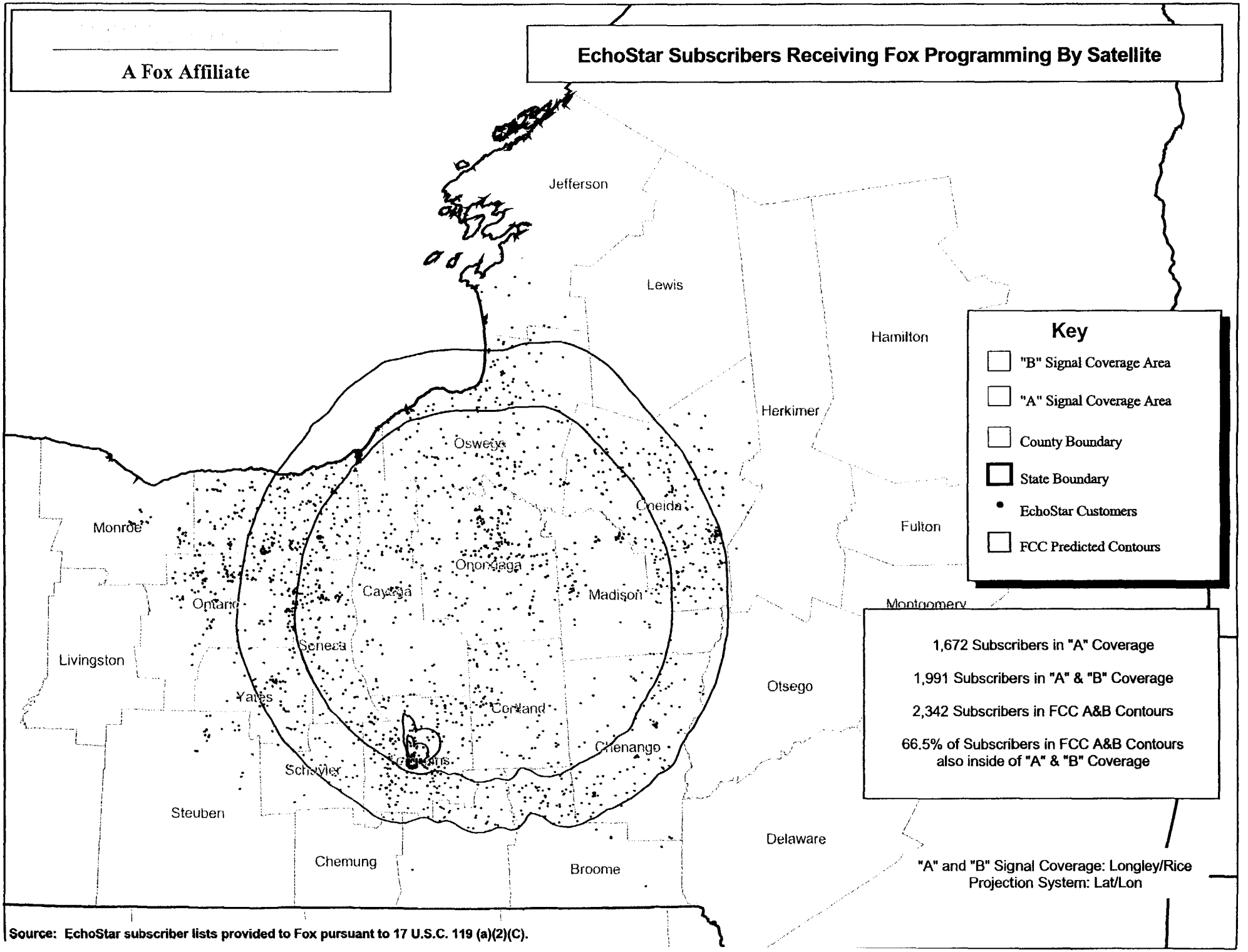
88.8% of Subscribers in FCC A&B Contours also inside of "A" & "B" Coverage

"A" and "B" Signal Coverage: Longley/Rice
Projection System: Lat/Lon

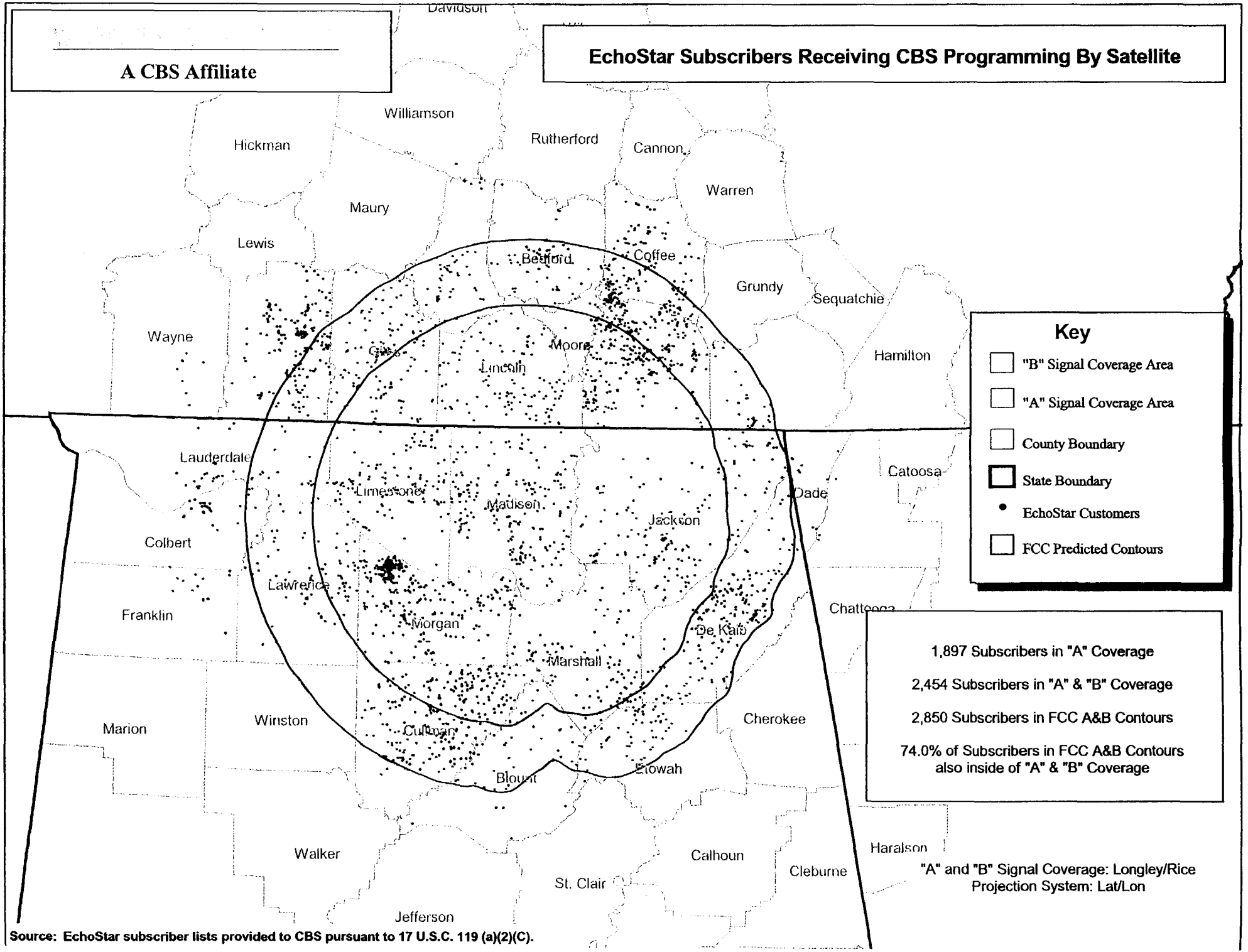
Source: EchoStar subscriber lists provided to ABC pursuant to 17 U.S.C. 119 (a)(2)(C).

A Fox Affiliate

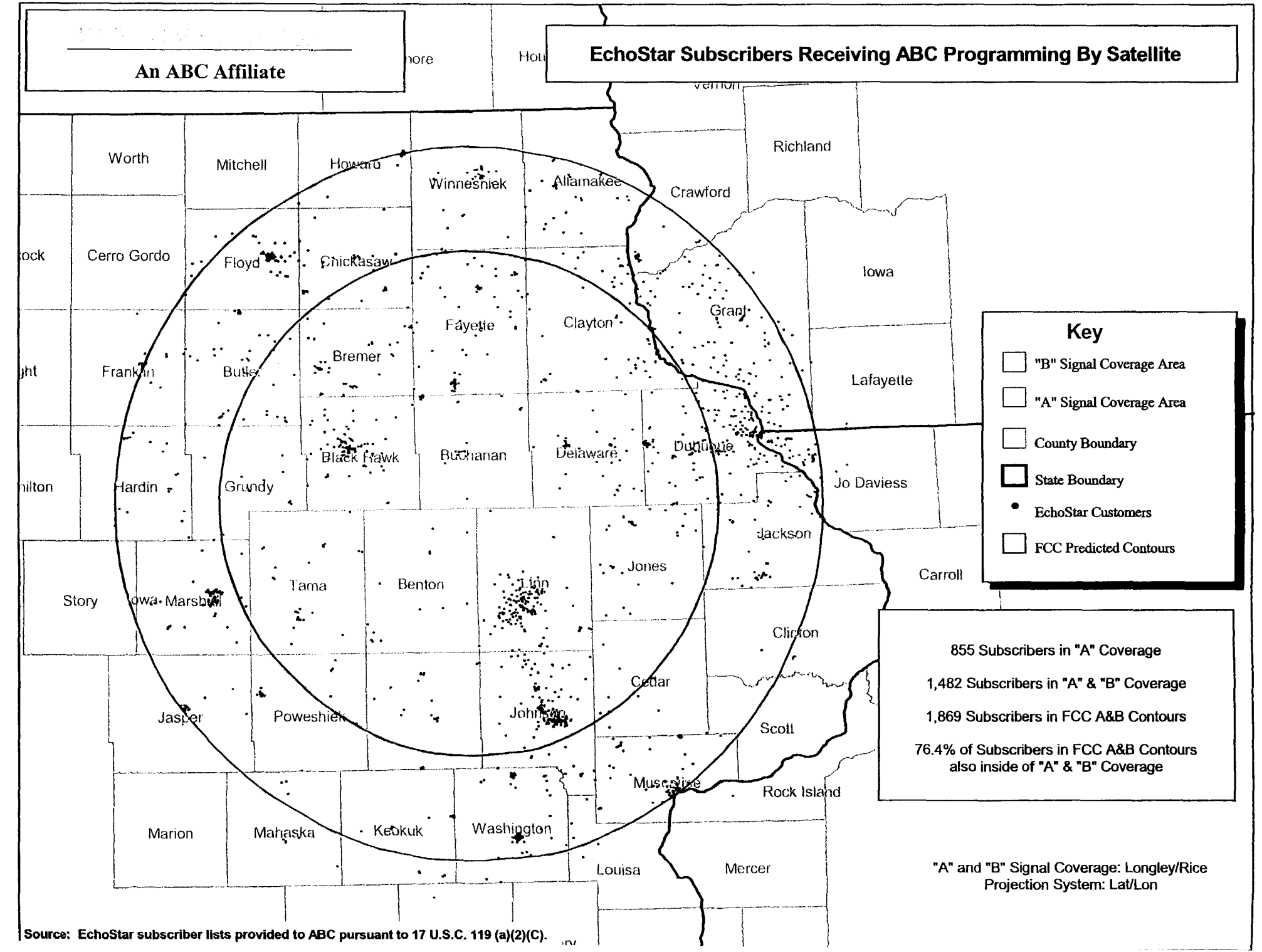
EchoStar Subscribers Receiving Fox Programming By Satellite

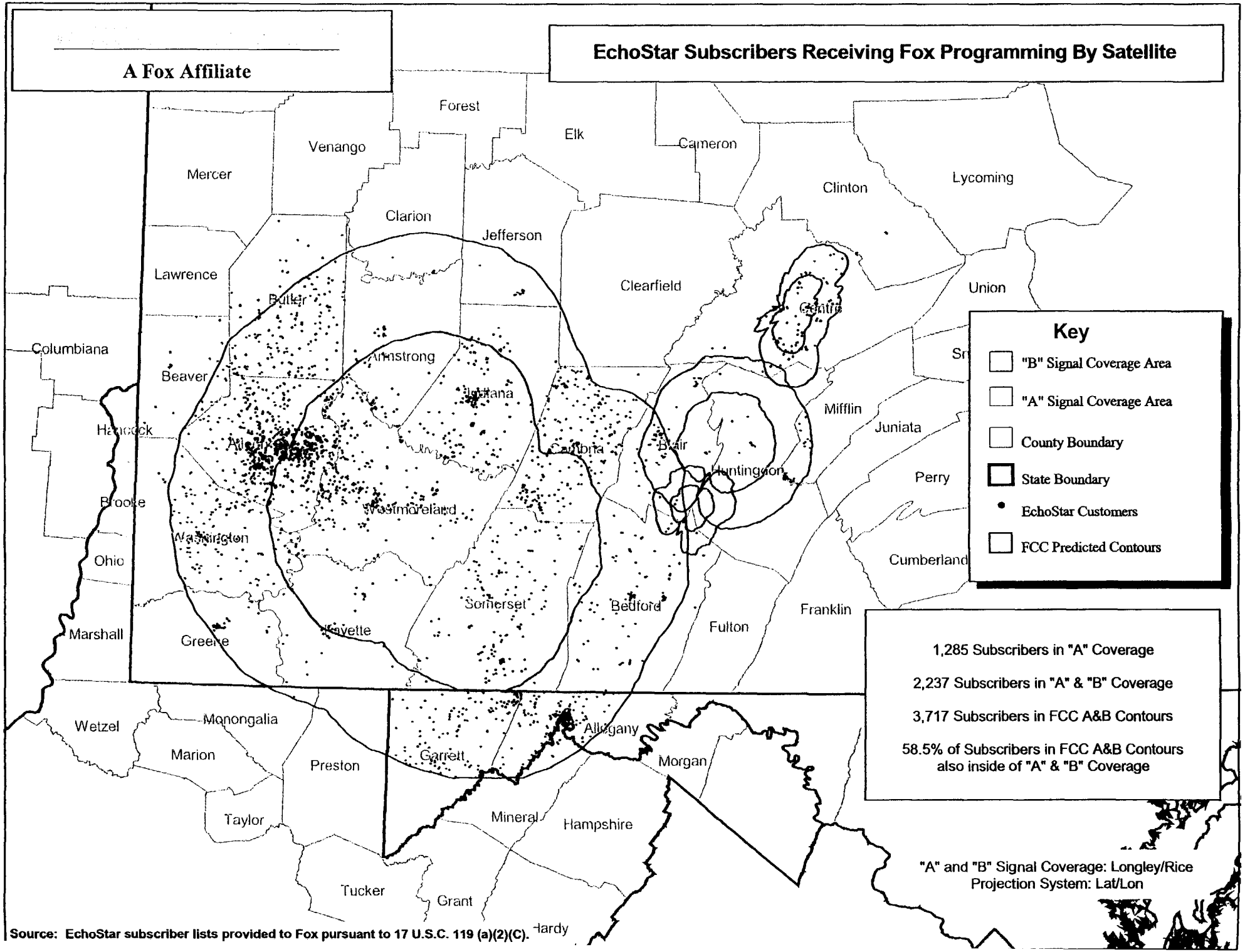


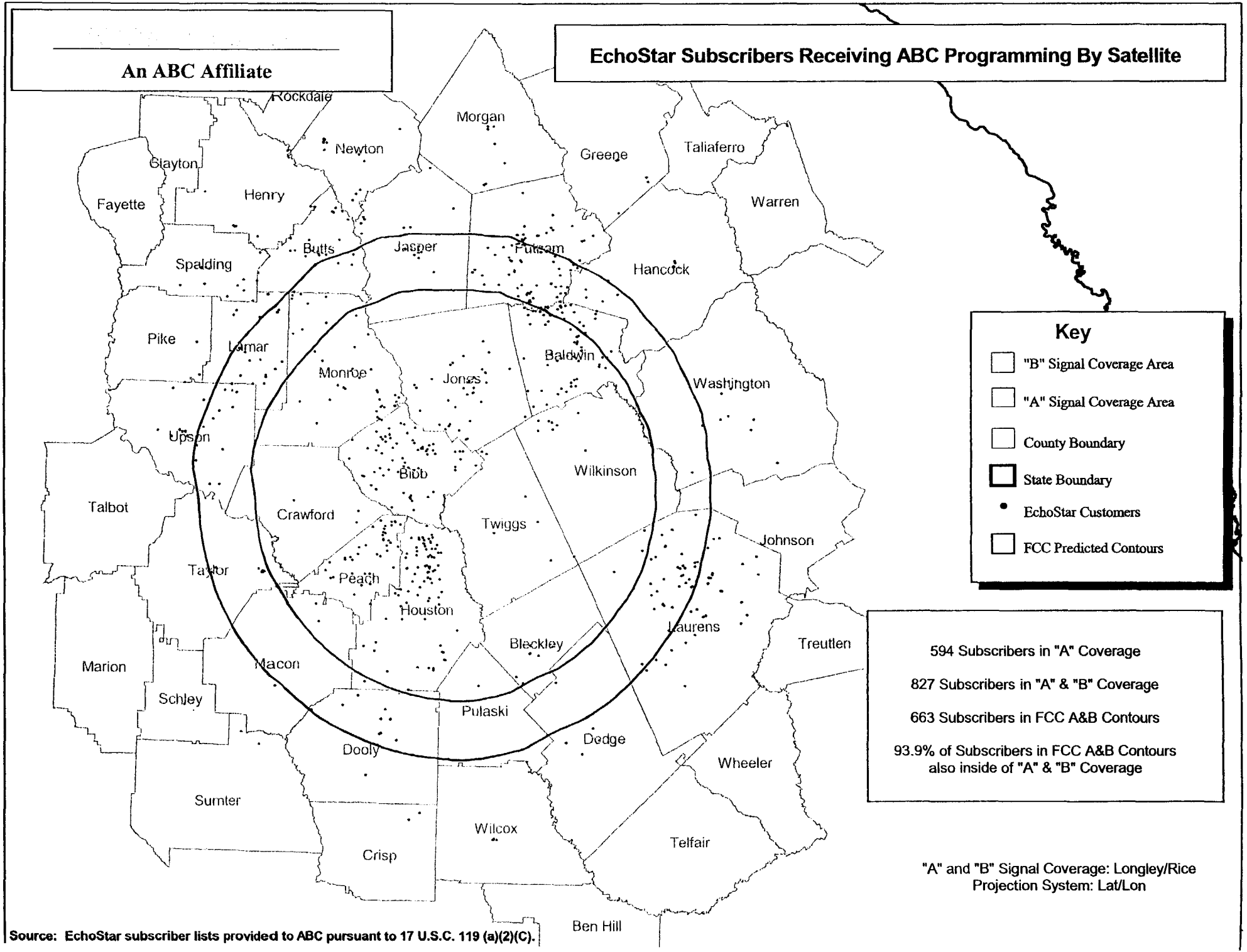
Source: EchoStar subscriber lists provided to Fox pursuant to 17 U.S.C. 119 (a)(2)(C).



Source: EchoStar subscriber lists provided to CBS pursuant to 17 U.S.C. 119 (a)(2)(C).

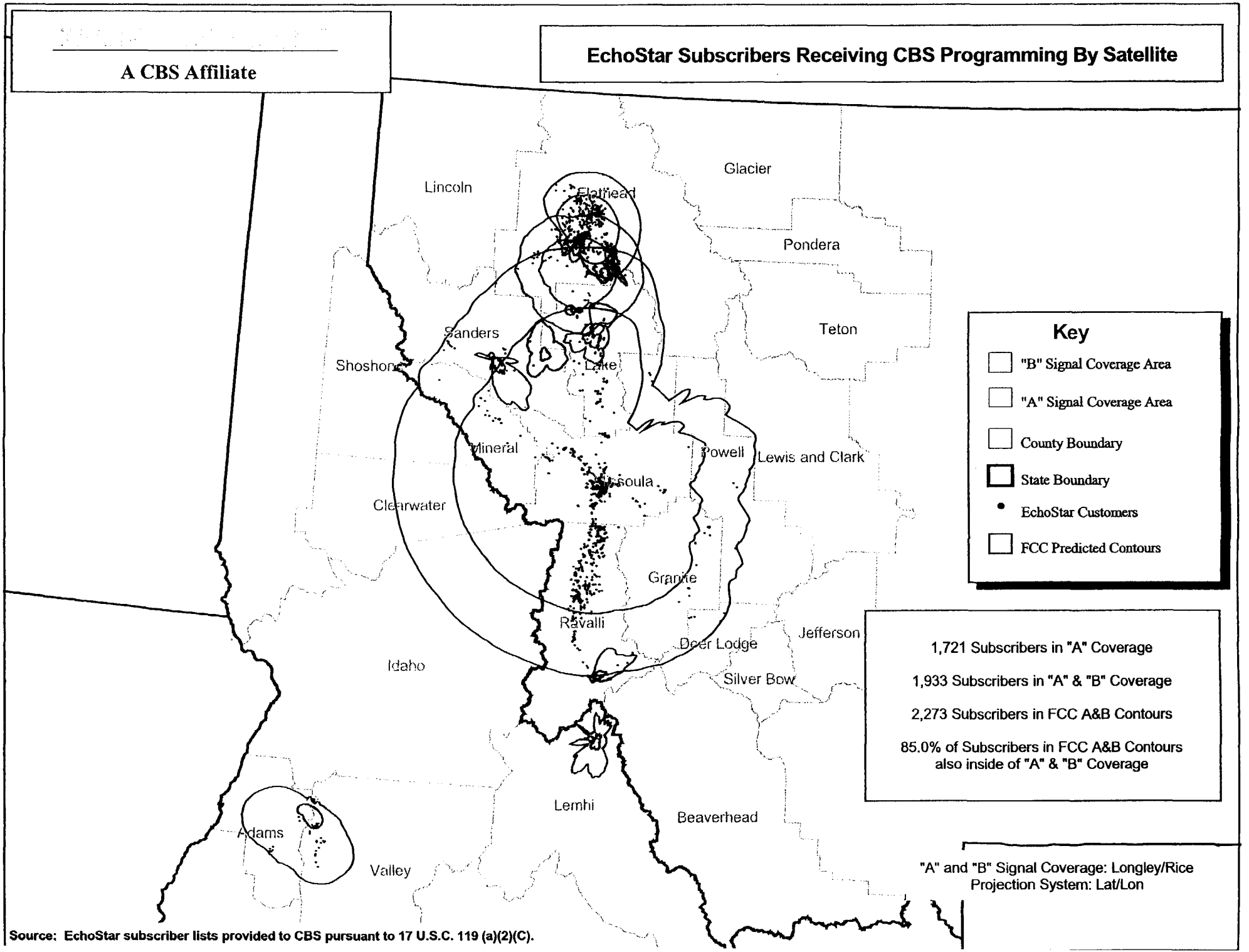

An ABC Affiliate
EchoStar Subscribers Receiving ABC Programming By Satellite
Worth
Mitchell
Howard
Winneshiek
Allamakee
Crawford
Richland
Cerro Gordo
Floyd
Chickasaw
Iowa
Grant
Fayette
Clayton
Bremer
Franklin
Butler
Lafayette
Black Hawk
Buchanan
Delaware
Dubuque
Hardin
Grundy
Jo Daviess
Jackson
Jones
Carroll
Story
Tama
Benton
Linn
Clinton
Cedar
Jasper
Poweshiek
Johnson
Scott
Muscatine
Rock Island
Marion
Mahaska
Keokuk
Washington
Louisa
Mercer
Key
"B" Signal Coverage Area
"A" Signal Coverage Area
County Boundary
State Boundary
EchoStar Customers
FCC Predicted Contours
855 Subscribers in "A" Coverage
1,482 Subscribers in "A" & "B" Coverage
1,869 Subscribers in FCC A&B Contours
76.4% of Subscribers in FCC A&B Contours also inside of "A" & "B" Coverage
"A" and "B" Signal Coverage: Longley/Rice
Projection System: Lat/Lon
Source: EchoStar subscriber lists provided to ABC pursuant to 17 U.S.C. 119 (a)(2)(C).


A Fox Affiliate
EchoStar Subscribers Receiving Fox Programming By Satellite
Forest
Elk
Cameron
Venango
Mercer
Clinton
Lycoming
Clarion
Jefferson
Lawrence
Clearfield
Union
Butler
Columbiana
Armstrong
Beaver
Indiana
Mifflin
Juniata
Blair
Cambria
Huntingdon
Perry
Brooke
Westmoreland
Washington
Ohio
Cumberland
Somerset
Bedford
Franklin
Marshall
Fayette
Greene
Fulton
Wetzel
Monongalia
Allegany
Marion
Garrett
Preston
Morgan
Taylor
Mineral
Hampshire
Tucker
Grant
Hardy
Key
"B" Signal Coverage Area
"A" Signal Coverage Area
County Boundary
State Boundary
EchoStar Customers
FCC Predicted Contours
1,285 Subscribers in "A" Coverage
2,237 Subscribers in "A" & "B" Coverage
3,717 Subscribers in FCC A&B Contours
58.5% of Subscribers in FCC A&B Contours also inside of "A" & "B" Coverage
"A" and "B" Signal Coverage: Longley/Rice
Projection System: Lat/Lon
Source: EchoStar subscriber lists provided to Fox pursuant to 17 U.S.C. 119 (a)(2)(C).


An ABC Affiliate
EchoStar Subscribers Receiving ABC Programming By Satellite
Rockdale
Morgan
Newton
Greene
Taliaferro
Clayton
Henry
Fayette
Warren
Butts
Jasper
Putnam
Spalding
Hancock
Pike
Lamar
Monroe
Jones
Baldwin
Washington
Upson
Bibb
Wilkinson
Talbot
Crawford
Twiggs
Johnson
Taylor
Peach
Houston
Laurens
Treutlen
Bleckley
Marion
Macon
Schley
Pulaski
Dodge
Dooly
Wheeler
Sumter
Wilcox
Telfair
Crisp
Ben Hill
Key
"B" Signal Coverage Area
"A" Signal Coverage Area
County Boundary
State Boundary
EchoStar Customers
FCC Predicted Contours
594 Subscribers in "A" Coverage
827 Subscribers in "A" & "B" Coverage
663 Subscribers in FCC A&B Contours
93.9% of Subscribers in FCC A&B Contours also inside of "A" & "B" Coverage
"A" and "B" Signal Coverage: Longley/Rice
Projection System: Lat/Lon
Source: EchoStar subscriber lists provided to ABC pursuant to 17 U.S.C. 119 (a)(2)(C).

A CBS Affiliate

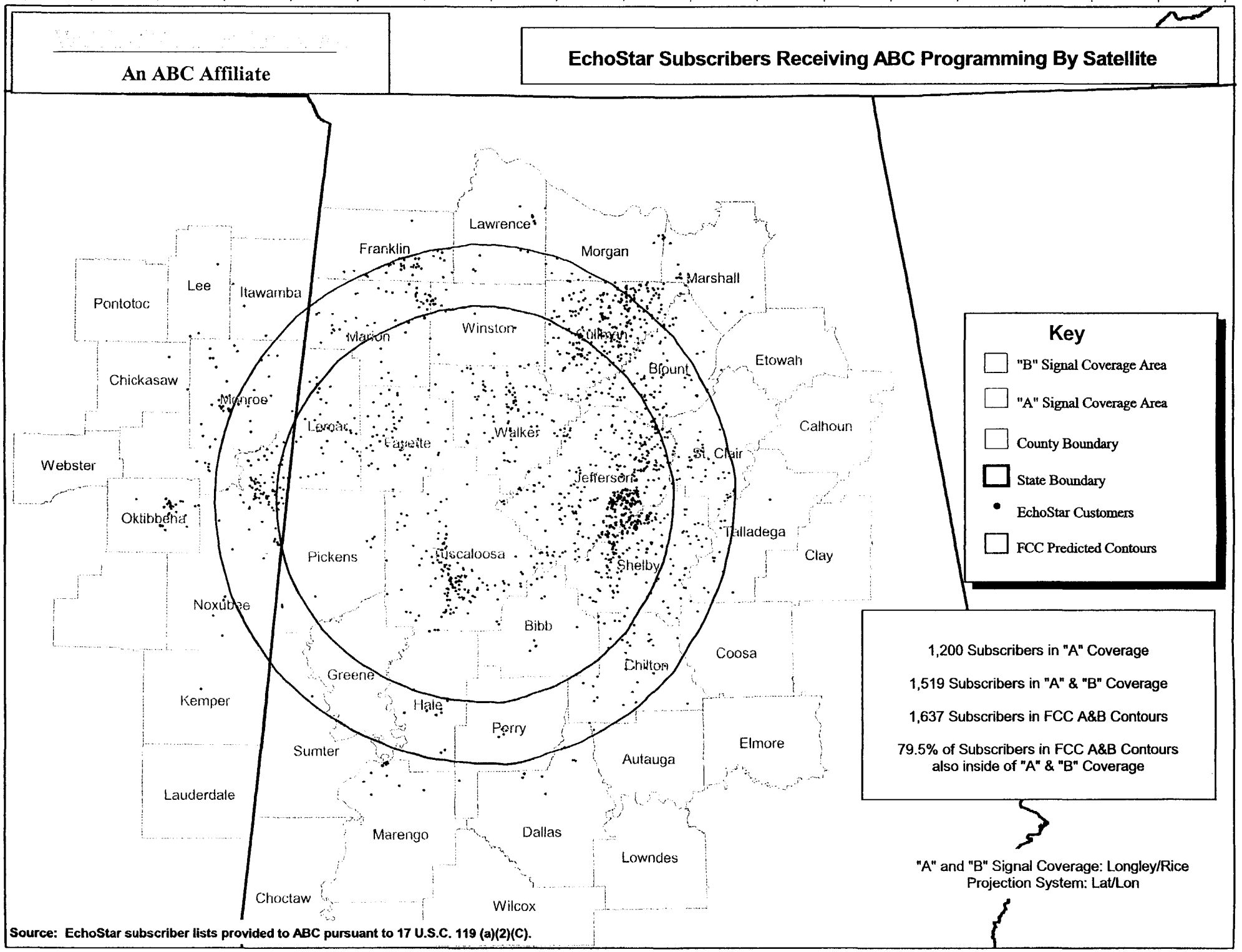
EchoStar Subscribers Receiving CBS Programming By Satellite



Source: EchoStar subscriber lists provided to CBS pursuant to 17 U.S.C. 119 (a)(2)(C).

An ABC Affiliate

EchoStar Subscribers Receiving ABC Programming By Satellite



Source: EchoStar subscriber lists provided to ABC pursuant to 17 U.S.C. 119 (a)(2)(C).

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DECISIONMARK CALCULATIONS FOR CBS TELEVISION NETWORK BASED ON MODIFIED METHODOLOGY

***LR 90/50/90**

	USA TOTALS	SERVED	UNSERVED	PERCENT UNSERVED
1997 Population	267,512,170	171,731,742	95,780,428	35.80%
1997 Households	99,806,450	64,462,039	35,344,411	35.40%
Land Area	7,256,641	1,142,469	6,114,172	84.20%

* Custom Grade B Cut-Offs Used

Method: Analysis of CBS Television Network Coverage. "Grade B" intensity defined as 70.75, 76.5, and 92.75 dBu for low VHF, high VHF, and UHF. Longley-Rice Version 1.2.2 with 50% location, 90% time, and 90% confidence.