Alaska Population Projections
2007 - 2030
Welcome!

Alaska Department of Labor and Workforce Development
What Will Be Covered

Alaska Population Projections: Methods and Results
Preface: What These Projections Do and Don’t Offer

Do: Projected future population levels for Alaska, based on recent history of fertility, mortality and migration rates.

Do not: A crystal ball gaze into the future.
A VERY Brief Overview of Alaska’s Population History
Components of Population Change for Alaska, 1947-2006

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section, Demographics Unit.
Methods
Statewide Methods

“Cohort component” with “quantified uncertainty”.

Used a relatively simple design to quantify uncertainty.
The Cohort-Component Method

Year 2000 Age | Year 2010 Age
---|---
0 | 0
10 | 10
20 | 20
30 | 30
40 | 40
50 | 50
60 | 60
70 | 70
80 | 80
90 | 90
100 |

Adjustment for Births, Migrations, Deaths

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section
Quantified Uncertainty

Uncertainty was quantified through 90% confidence intervals (slightly over-estimated these to provide continuous “variants”).

The intervals were calculated through the simulation of 2,000 potential futures for fertility and migration.
Births
Used the Total Fertility Rate as an Index Value

Projected 2,000 potential paths for the TFR, based on an autoregressive model.
Total Fertility Rate, Alaska and the United States
1975-2004 Estimates

Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section and U.S. National Center for Health Statistics
Total Fertility Rate, Alaska and the United States
1975-2005 Estimated, 2006-2030 Projected*

* “Middle” is the median of the distribution, “High” and “Low” are the 90% confidence bounds.

Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section and U.S. National Center for Health Statistics
Total Fertility Rate, Alaska and the United States
1975-2005 Estimated, 2006-2030 Projected*

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1975-2005 Estimated, 2006-2030 Projected*

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Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section and U.S. National Center for Health Statistics
Age Specific Fertility Rates

Used a fixed age profile for fertility, and shifted it up and down with the projected TFR paths.
Migration
Used Crude Migration Ratios (In and Out) as Index Values

Projected 2,000 potential paths for In- and Out-Migration, based again on autoregressive models.

Adjusted the models based on expert judgment.

Together, these yielded Net-Migration Ratios.
Net Migration Ratio, Alaska

1975-2005 Estimated, 2006-2030 Projected*

* "Middle" is the median of the distribution, "High" and "Low" are the 90% confidence bounds.

Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Net Migration Ratio, Alaska
1975-2005 Estimated, 2006-2030 Projected*

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Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section
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1975-2005 Estimated, 2006-2030 Projected*

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Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Net Migration Ratio, Alaska
1975-2005 Estimated, 2006-2030 Projected*

* “Middle” is the median of the distribution, “High” and “Low” are the 90% confidence bounds.
Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Age Specific Migration Shares

Used fixed age profiles for In- and Out-Migration shares, and shifted them up and down with the projected Migration paths.

These yielded an age pattern for Net-Migration.
Net Migration Across Age
Alaska, Stylized

Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Net Migration Across Age
Alaska, Stylized

Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Net Migration Across Age
Alaska, Stylized

Follow Mom and Dad

Come to work in Alaska

Off to new places, college...

Age

Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Net Migration Across Age
Alaska, Stylized

Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Deaths
Used “Brass” Alpha and Beta to Project Just a Single Path For Death Rates

Calculated the annual change (2004-2030) in Brass’ Alpha and Beta for the US SSA projected life tables.

Applied these to 2004 Alaska life tables.
Female Life Expectancy at Birth, Alaska and the United States

Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section and U.S. Social Security Administration
Statewide Results
Alaska’s Total Population

* Of 2000 paths, “Middle” is the median of the distribution, “High” and “Low” are the 90% confidence bounds.

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
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Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Births

* Of 2000 paths, “Middle” is the median of the distribution, “High” and “Low” are the 90% confidence bounds.
Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Deaths

* Of 2000 paths, “Middle” is the median of the distribution, “High and “Low” are the 90% confidence bounds.
Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Net Migration

* Of 2000 paths, “Middle” is the median of the distribution, “High” and “Low” are the 90% confidence bounds.

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Projected Population Pyramids
Alaska Estimated Population by Age and Sex, 2000

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Estimated Population by Age and Sex, 2001

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Estimated Population by Age and Sex, 2002

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Estimated Population by Age and Sex, 2004

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Estimated Population by Age and Sex, 2005

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Estimated Population by Age and Sex, 2006

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2007

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2008

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2009

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2010

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2011

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2012

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2013

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2014

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2015

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2016

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2017

* Conditionally estimated 90% probability that the future will fall between the "High" and "Low" boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2018

* Conditionally estimated 90% probability that the future will fall between the "High" and "Low" boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2019

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2020

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2022

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2023

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2024

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2025

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2026

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2027

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2028

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska Projected Population by Age and Sex, 2029

* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska’s Projected Population Ages 0-17
2005-2030

* Of 2000 paths, “Middle” is the median of the distribution, “High” and “Low” are the 90% confidence bounds.

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska’s Projected Population Ages 18-64
2005-2030

* Of 2000 paths, “Middle” is the median of the distribution, “High” and “Low” are the 90% confidence bounds.

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Alaska’s Projected Population Ages 65+
2005-2030

* Of 2000 paths, “Middle” is the median of the distribution, “High” and “Low” are the 90% confidence bounds.

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section
Borough and Census Area Projections
Methods

Used a traditional, deterministic, cohort component approach for each area.

Calculated fertility and migration separately for each area, and estimated mortality based on the proportion Native American.

The final output was adjusted to the median state projection with 3-D Raking (IPF).
Potential Future Improvements
Fertility: Use an improved time-series model (variation here seems relatively small).

Migration: With borough, state, and national data, use age specific rates for Out-Migration, and share them back in for In-Migration (“Migrant Pooling”).

Mortality: Project various potential futures for a Mortality index.

Reporting: Use a database rather than high/low variants.

….and many more(!)...
Thank You!

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More information and complete data: almis.labor.state.ak.us