2   TRANSFORMATION, GROWTH, AND GOVERNANCE AT CARACOL, BELIZE

Adrian S.Z. Chase

Around 650 CE the city of Caracol was one of the largest cities in the world. However, it did not begin as a large city. Instead Ux Witz Ha' ("three stone place" – the city's hieroglyphic name) came into being from the conurbation of three separate centers. Three architectural complexes formed the initial districts of the larger city – Downtown Caracol, Hatzcap Ceel, and Cahal Pichik – between the Preclassic and Early Classic Periods. This unification resulted in a path dependent urban from with future growth focused on multiple monumental nodes and a dendritic causeway system. Settlement growth relied on the incorporation or construction of public plazas and monumental architecture to provide urban infrastructure and administrative cohesion over the landscape. What follows is a preliminary temporal sequence for the districts, tracing the growth of the city from the Preclassic to the Terminal Classic Periods. By combining lidar, archaeology, and hieroglyphic data a broader interpretation of governance within the city can be elucidated. Over time, Caracol shifted back and forth between more collective and more autocratic governance systems until the political, economic, and demographic collapse of the city around 900 CE.

Introduction

At its height in 650 CE Caracol, Belize has been identified as the 7th largest city in the world (Modelski 2003) and was one of the largest known Classic Period Maya cities. However, Caracol did not begin as a massive civic center, and this paper provides a preliminary overview of how the city of Caracol changed and grew over time. The initial form of growth and civic investment within this landscape guided Caracol's administration towards a more collective form of governance. For most of the city's history it had a more faceless administration with transitions through alternative phases of more collective and more autocratic rule. Understanding these shifts and changes requires integration of the epigraphic, excavation, and geospatial datasets.

Based on ceramic sequences, the Caracol Archaeological Project has identified six time periods for dating excavations (see Table 1 and D. Z. Chase and A. F. Chase 2017:185-249 for additional information). First, the Preclassic from 600 BCE to 250 CE covers the period of initial settlement on the landscape for what later becomes the city of Caracol. Second, Early Classic 1 from 250 to 400 CE correlates with the end of E group construction and the founding of Caracol's dynastic lineage. Third, Early Classic 2 from 400 to 550 CE highlights an upturn in urban growth when the city focused on extensive expansion of its causeway system. Fourth, Late Classic 1 from 550 to 680 covers the timespan of Caracol's wars with and subjugation of Tikal and

Naranjo, an era that ends with Caracol's defeat by Naranjo and that is correlated with massive population growth. Fifth, Late Classic 2 from 680 to 800 showcases an era of "faceless" administration associated with widespread wealth sharing during the city's apogee. Finally, the Terminal Classic from 800 to 900 CE covers the reestablishment of rulership at Caracol and ends with the depopulation the city.

While relatively fine-tuned from an archaeological perspective, these periods cover relatively large spans of time for investigating transformations and social change. The smallest represents approximately 100 years while the longest covers over 850 years. In addition, assuming a 20-year generation, the rise and decline of Caracol the city took approximately 1500 years or about 75 generations (or 50 generations at 30-years per generation). Thus, these periods provide a very coarse picture of Caracol's urban development and city growth from the perspective of a single life-span.

At its apogee, Caracol was populated by over 100,000 individuals within its 200 square kilometers of urbanized area within modern-day Belize. This value represents a conservative population estimate based on 10 persons per plazuela group; in contrast, structure or mound-based population estimates would more than double this figure to over 200,000 people (see Chase et al. 2024). Archaeological data provide evidence for slow, internal population growth from the Preclassic through the Early Classic periods (Chase and Chase 2018). The Late

Table 1. Chronology in use by the Caracol Archaeological Project. Dates are approximate.

Time Period	Start	Length	End	Essential Feature
Terminal Classic	800	100	900	Slow abandonment and emptying of the city
Late Classic 2	680	120	800	Expansion into peripheral areas (i.e., suburbs)
Late Classic 1	550	130	680	Population boom
Early Classic 2	400	150	550	Expanding the east-west causeway system
Early Classic 1	250	150	400	End of E group construction
Preclassic	-600	850	250	Monumental Reservoirs

Classic periods showcase increased population growth and in-migration (due to successful warfare events as per Chase and Chase 1989; Chase and Chase 1998a), and the Terminal Classic shows a tremendous population decline (Figure 1).

Initially, as the population grew, the city incorporated other settlements through the process of conurbation (the joining together of previously separate cities into one), but this process shifted in Late Classic 1 to the construction of planned district nodes (Table 2). While establishment of exact district-by-district incorporation dates requires additional excavation data, this article presents a preliminary set of hypotheses for when districts were added (but not when they were founded) based on current excavation data, the presence of temporal markers like E groups and monumental reservoirs, the causeway construction sequence, and the distribution of apogee population density. The shift from incorporating existing settlements as district nodes into the construction of new district nodes also provides proxy evidence for the development of additional administration and record-keeping between the Early and Late Classic periods.

Historical Periods

While larger time periods can be used to look at large changes in population growth and urban expansion, they do not provide a fine-grained lens for looking at other historical changes. Instead, by combining excavation data, radiocarbon dates, and hieroglyphic information, a more complex history emerges that reveals important social transformations and adaptations.
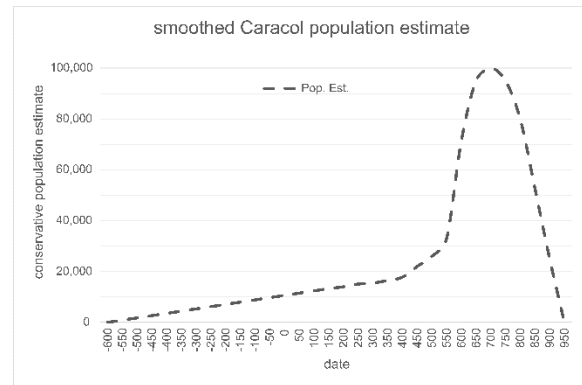
Figure 1. Conservative population estimate for Caracol, Belize (see Chase et al. 2024).

Villages

Based on archaeological data, the initial occupation in what would become Caracol the city began by 600 BCE. These materials are generally deeply buried, thus future excavations may push this date further back in time or provide additional details. During this era, the landscape appears to have been populated by isolated households and incipient villages. These likely provided the foundations for early district centers and their adjacent neighborhoods, but this occupation predates monumental construction, divine kingship, or urban service provisioning at Caracol.

Three Towns

Around 360 BCE the earliest monumental construction is found at Downtown Caracol (A. F. Chase and D. Z. Chase 2017:60), and similar constructions take place at the two centers of Hatzcap Ceel and Cahal Pichik (Chase and Chase 1995:92-93) in what J. Eric S. Thompson (1931) called Mountain Cow. This time period is defined throughout the Maya area

Table 2. Current hypotheses of which districts were added to the city of Caracol by period.

Growth of Caracol the City

Time Period	District Center	Expansion Type
Preclassic	Cahal Pickik	Conurbation
Preclassic	Downtown Caracol	Conurbation
Preclassic	Hatzcap Ceel	Conurbation
Early Classic 1	Ceiba	Conurbation
Early Classic 1	Cohune	Conurbation
Early Classic 1	La Rejolla	Conurbation
Early Classic 2	Monterey	Conurbation
Early Classic 2	New Maria Camp	Conurbation
Early Classic 2	Retiro	Conurbation
Early Classic 2	San Juan	Conurbation
Late Classic 1	Chaquistero	Conurbation
Late Classic 1	Conchita	Planned
Late Classic 1	Midway	Conurbation
Late Classic 1	Puchituk	Planned
Late Classic 1	Ramonal	Planned
Late Classic 1	Round Hole Bank	Planned
Late Classic 1	Terminus D	Planned
Late Classic 2	Terminus A	Planned
Late Classic 2	Terminus B	Planned
Late Classic 2	Terminus C	Planned
Late Classic 2	Terminus E	Planned
Late Classic 2	Terminus F	Planned
Late Classic 2	Terminus G	Planned
Unknown	Las Flores Chiquibul	Conurbation
Unknown	San Jose	Conurbation

by E groups and their role as early community centers (Freidel et al. 2017). This initial process of monumental construction represents a concrete example of collective action (sensu Ostrom 2007) and consensus building (sensu Smith 2016), undertaken without any clear indication of individual rulership. While specific individuals likely took leading roles in their communities, these communities remained small and any leaders remained essentially faceless to us especially given the lack of iconography and text.

Downtown Caracol, Hatzcap Ceel, and Cahal Pichik also become the only district nodes within the urban limits of later Caracol that had monumental reservoirs – those with over 1000 square meters of surface area. Given the size of these districts and their associated features (Chase 2016, 2019, 2021), these monumental reservoirs would have been built during the Preclassic period. All three centers would have likely acted as independent and autonomous settlements with their own local governance. However, they were close enough to have frequently interacted and later population densities are highest between all three suggesting that they quickly became connected and entangled by a continuous landscape of intermixed settlement and agriculture.

City of Caracol

Eventually, Downtown Caracol, Hatzcap Ceel, and Cahal Pichik joined together into a single settlement. After this conurbation, they formed the singular city of Caracol and constructed an essential east-west causeway that linked all three nodes together. This initial backbone road and settlement integration created the preconditions to facilitate the high degree of Caracol's of collective governance observed in subsequent time periods (Chase 2021; Feinman and Carballo 2018) and also those that eventually led to symbolic egalitarianism in the Late Classic period (Chase and Chase 2009; D. Z. Chase and A. F. Chase 2017). This conurbation likely occurred around or after 41 CE but certainly before 331 CE, when Caracol established its rulership.

This era would have required all three monumental nodes and their prominent residents to negotiate and work together thereby creating a power balance that could have prevented the rise of a single individual to power (sensu Blanton and Fargher 2016; Boix 2015). However, another hint of greater cooperation comes from the glyphic name of ancient Caracol – *Ux Witz Ha'* (three stone place / three water mountain). Simon Martin (2020:74) indicates that this emblem glyph does not follow the standard conventions for a dynastic title and potentially harkens back to a Preclassic identity; Tokovinine (2013:69) identifies the title as being "Those of" Caracol. The name could be a reference to a multitude of triadic things (e.g., three cooking stones in a hearth, three stones under an altar, etcetera), but it is likely that *Ux Witz Ha'* actually refers to the conurbation of Downtown Caracol, Hatzcap Ceel, and Cahal Pichik into one urban entity – especially since later rulers sometimes use a separate title that may refer to the Caracol polity as a whole instead of to the city as a place. The later use of this emblem glyph by individual rulers suggests that this name still held political legitimacy throughout the Classic Period.

Wealthy burials of this period exhibit strong ritual associations. For example, around 150 CE a very elaborate burial was made in the Northeast Acropolis (adjacent to Caana) of a woman ritually buried as a personification of Ix Chel (Brown 1998). Not quite 200 years later, this same residential area would house a Teotihuacan-style burial (Chase and Chase 2011).

Dynastic Founding

A dynastic lineage establishes itself at Caracol in 331 CE (A. F. Chase and D. Z. Chase 2021:226). The ruling family probably represents a cadet branch related to the ruling dynasty already established at Tikal, and this likely association then provides a foundation and logic for Caracol's later subjugation of Tikal (Chase and Chase 2020b; Chase et al. 2022). As mentioned earlier, the emblem glyph the Caracol dynasty initially uses does not take the usual form (Martin 2020:74; Tokovinine 2013:69), placing priority on the group and place. Thus, the legitimacy of governing in this time remained focused on the three stone places of Downtown Caracol, Hatzcap Ceel, and Cahal Pichik rather than on a divine ruler.

Another very important event occurs between 300 and 350 CE when a Teotihuacan-style burial is interred in the center of the Northeast Acropolis (Chase and Chase 2011), foreshadowing the Teotihuacan affectations of *K'inich Yax K'uk' Mo'* who established a dynasty at Copan in 426 CE as a cadet-branch from Caracol's ruling family (Helmke et al. 2019:101-103). While the temporal association between Caracol's dynastic founding and Teotihuacan interactions may be a coincidence, Teotihuacan impacted other Maya cities in a similar way (Houston et al. 2021) and the Maya in turn impacted Teotihuacan (Sugiyama et al. 2020).

Empire

The nature of rulership and governance at Caracol changes drastically during the reigns of its most powerful rulers: *Yajaw Te' K'inich* (Lord Water), *K'an* II, and *K'ak' Ujol K'inich* (Smoke Skull). They expand the maximum extent of the Caracol polity including the subjugation of both Tikal and Naranjo (Chase and Chase 1998a, 2020b). At the same time, a second emblem glyph appears for Caracol, *K'uhul K'antu' Mak*. While the first emblem glyph, *Ux Witz Ha'*, referred to the city of Caracol itself, it seems likely that this second emblem glyph, *K'uhul K'antu' Mak*, likely refers to a broader political domain and not a physical location (Helmke et al. 2006:5-6; Tokovinine 2013:69).
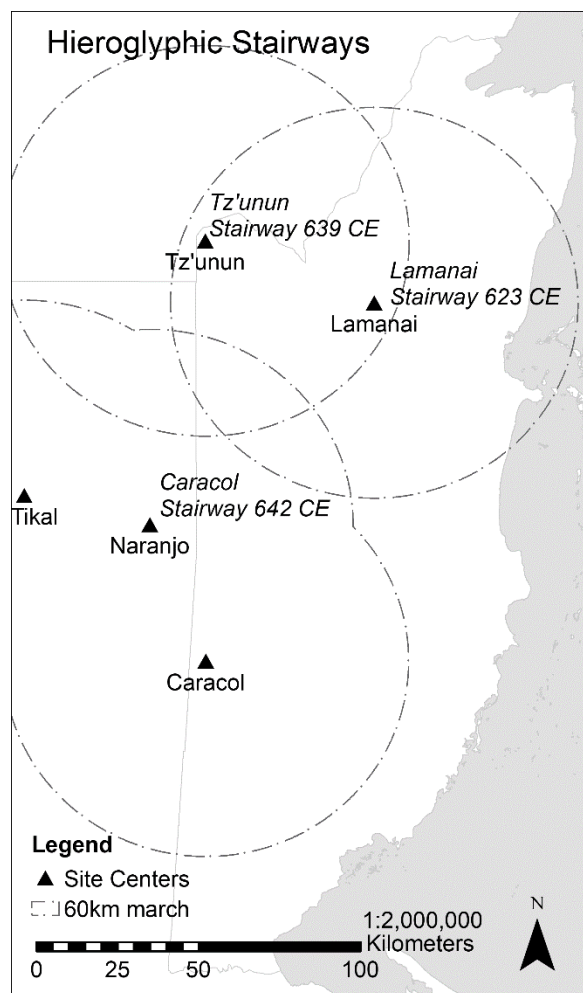
Figure 2. Three hieroglyphic stairways erected at Lamanai, Tz'unum, and Naranjo suggesting three polities in Northern Belize (dates from Helmke 2020:275-276).

The textual information from the early Late Classic contains a detailed epigraphic history for two of these three rulers. First, Lord Water becomes Caracol's ruler in 553 CE under Tikal sponsorship. In spite of this relationship, Tikal attacks Caracol in 556 CE. Six years later in 562 CE Lord Water engages in a war of independence from Tikal and then the historical record becomes cloudy. An individual called *Knot Ajaw* conducts rituals at Caracol in place of the ruler, but is also not identified as the ruler nor ascends to rulership (Chase and Chase 2008:100-101; Houston 1991:41). This distinction suggests that *Knot Ajaw* acts in a ceremonial role and hints at the additional layers of administration that exist beyond the purview of the textual record.

Confusion over rulership continues into the time after Lord Water's death around 600 CE

but before *K'an* II (born in CE 588) ascends to the position of ruler in 618 CE (A. F. Chase and D. Z. Chase 2021:228). The presence and unclear role of *Knot Ajaw* suggests that some political turmoil and intrigue was involved in *K'an* II's ascent to rulership; eventually, his legitimacy is firmly established and he commissioned multiple monuments. *K'an* II ties himself firmly to the legacy of Lord Water through the text of Altar 21 (placed in 633 CE), indirectly associating his father's victories over Tikal to his own victories over Naranjo. While Martin (2005:4) attributes this military success to a ruler of the snake dynasty (located at Dzibanche) based on the remaining curl of a single highly effaced glyph (Q4), it seems unlikely that Caracol would be able to govern over and successfully inter two of its rulers at Tikal (see Chase and Chase 2020b) if this had been the case.

The epigraphic record of Caracol describes a series of battles *K'an* II had with Naranjo between 626 and 628 CE before a final conflict in 631 CE (Chase and Chase 2003). At this date, *K'an* II very likely governed from Naranjo (D. Z. Chase and A. F. Chase 2021:229) and garrisoned his military forces there, especially since that city provides an effective starting point for marching to quell either rebellions or incursions between all three cities (Chase and Chase 1998a). It is also a better location to observe and possibly control one of two primary east-west trade routes in the region (Chase and Chase 2012). While at Naranjo, *K'an* II commissioned the Caracol stairway in 642 CE likely in response to those erected at Lamanai in 623 CE and Tzunun in 639 CE (Helmke 2020:275-276). The timing and distribution of these three stairways suggests a three-polity division of northern Belize (Figure 2), especially given the 60 kilometer three-day marching figure for direct territorial control (Hassig 1991).

This period of Caracol's dominance ended well into the reign of Smoke Skull. Of the three Caracol lords from this era, he has the fewest monuments and remains largely unknown. Just as *K'an* II likely would have overseen the burial of Lord Water in Tikal's Temple 5D-32, Smoke Skull likely oversaw *K'an* II's burial in Temple 5D-33 (Chase and Chase 2020b:35). A stucco building text buried within the fill of Caana records Smoke Skull's accession in 658

CE, his defeat by Naranjo in 680 CE, and his return to Caracol three months later (D. Z. Chase and A. F. Chase 2017:206-207). Despite ruling for at least 22 years, the lack of a more detailed record suggests that his monuments were removed and destroyed after his defeat. It is also unclear if he or another individual becomes ruler at Caracol after his 680 CE defeat, but it did lead to the re-establishment of independent dynastic lines at both Naranjo and Tikal (Chase and Chase 2020b:43-46).

Faceless Administration

The defeat of Smoke Skull in 680 CE marks the end of the Caracol polity's largest spatial extent, but this event proved counterintuitive. The defeat actually led to the wealthiest and most equitable phase of governance in Caracol the city through a system that has been called symbolic egalitarianism (Chase and Chase 2009; D. Z. Chase and A. F. Chase 2017:213-217).

This period has faceless rulership with the hieroglyphic identities of those living in the elite complexes remaining unknown. During this time, the city's administrative apparatus maintained peace, prosperity, and relatively collective governance for over a century. Whatever the changes enacted due to the military defeat were, they led to population growth, in-migration, and planned urban expansion that likely benefited from or evolved out of systems established during the previous era of successful warfare and polity growth. They also may have arisen from the requirements of managing the city while the ruler governed from elsewhere.

In any case, this time period, its administration, and its policies led to the most collective governance at Caracol along with the city's highest population (Chase et al. 2024). The maximum expansion of Caracol's agricultural terraces also occurs in this era (Chase and Weishampel 2016; Chase and Chase 1998b), and the widespread wealth of the population can be observed in the low Gini index an era of Caracol's residences at 0.34 (Chase 2017) and the distribution of urban services among its districts (Chase 2016).

Rulership Returns

Despite the successes of Caracol's more collective governance, events eventually led to the re-emergence of rulership and more autocratic governance. *Hok K'awiil* re-established the ruling dynasty in 798 CE; however, his autonomy does not appear to last. Monuments erected in 800 CE focus on external battles, but also show Caracol in alliance with former enemies (A. F. Chase and D. Z. Chase 2021:230). In the larger scheme of things, the resurgence of rulership (and monuments) correlates with a breakdown in social equality and a divide between the haves and have-nots at Caracol with the eventual depopulation of the city about 100 years later (Chase and Chase 2004; Chase and Chase 2008). In fact, the descendants of *Hok K'awiil* saw the burning of Downtown Caracol and the end of occupation in the epicenter around 900 CE (A. F. Chase and D. Z. Chase 2021:234).

Alliance Network

In 820 CE, only 22 years after the return of rulership, Caracol became a junior partner in an alliance network with Ucanal (A. F. Chase and D. Z. Chase 2021:241). Interestingly, Caracol's focus on alliances, just before the twilight of Maya rulership, correlates with a general decline in warfare events from the prior century (Grube 2021). As a whole, the complete network of alliances may have established a confederation that spanned the eastern Peten of Guatemala and the Belize River valley (Chase et al. 2023), something that can be seen in aggregate distributions of model-carved ceramics (LeMoine et al. 2022).

While social inequality increases in the archaeological record (Chase and Chase 2004), the iconography of rulership also abruptly changes. While earlier monuments would frequently depict the ruler as a central figure with a large headdress and ceremonial bar possibly towering over prisoners, later monuments depict the rulers as equals wearing less elaborate headwear and with a smaller aspergillum indicating command (D. Z. Chase and A. F. Chase 2021). While the increasing inequality suggests a more autocratic system as certain goods became restricted to specific residences, these changes in iconography and the short

Table 3. Historical periods at Caracol mixing archaeological and epigraphic datasets.

Historical Period	Start	End	Length	Primary Feature
Alliance Network	820	900	80	Alliance Network under Ucanal
Rulership Returns	798	820	22	Rulership Revived and High Inequality
Faceless Admin.	680	798	118	City's Apogee and Low Inequality
Empire	553	680	127	Caracol "Empire" for Three Rulers
Dynastic Founding	331	553	222	Dynastic founding (possibly from Tikal)
City of Caracol	41	331	290	Conurbation of CAR, HTZ, and CAH
Three Towns	-360	41	401	Monumental Architecture Constructed
Villages	-600	-360	240	Initial Settlement on Landscape

tenures of rulers in this era also suggest a less autocratic form of rulership was in effect.

Despite the governance in place, the Terminal Classic saw the decline of Caracol's population and the eventual depopulation of the city itself. The final on-floor deposits from Caracol suggest that the collapse of the city involved traumatic events. Around 900 CE, Downtown Caracol was burnt with household material and even unburied individuals left on the floors (Chase and Chase 2020a). While individuals may have tried to remain living among the agricultural terraces their families had built generations earlier, the political, economic, and social fabric of the city unraveled.

Summary

Using epigraphic and archaeological data together provides a more detailed narrative of how ancient Caracol grew, changed, and transformed before its depopulation and abandonment. Yet, this story is abridged. The actual history of this city would have included more twists and turns with generational differences at which this set of historical periods only begins to hint (Table 3), but for which other data and analyses can shed additional light.

Governance

The discussion above provides current information on the history of Caracol (Figure 3). In terms of governance and how it changes over time, five distinct periods emerge from aggregating specific historical events. These highlight how Caracol shifts between more collective and more autocratic governance over time (Table 4).

Initial governance at Caracol as it was settled remains unknown. The lack of monumental construction suggests that this phase saw independent residences and early villages form on the landscape, but has no clear indications of monumental architecture or civic structures. This covers the early to middle Preclassic period.

Monumental architecture dating to the late Preclassic at Downtown Caracol, Hatzcap Ceel, and Cahal Pichik demonstrate elements of more collective governance. Construction of E groups and monumental reservoirs likely occurred through collective action and early community collaboration that precedes rulership by almost 700 years. Towards the end of the Preclassic and into Early Classic 1 in the Vaca Plateau, three formerly independent centers joined together into the city of Caracol. This time period combines the "Three Towns" and "City of Caracol" (in Table 4) together.

Divine Kingship and the establishment of the Caracol ruling dynasty represents a more autocratic period of governance from 331 CE through 680 CE. This period sees a massive increase in population at Caracol after successful warfare against Tikal and Naranjo (Chase and Chase 1998a), especially during the reign of *K'an* II. It also demonstrates a shift from urban growth through conurbation towards urban planning in the city's expansion. Even given more autocratic aspects, path dependence from Caracol's founding and landscape (Chase and Chase 2014) ensured less autocracy than its contemporary
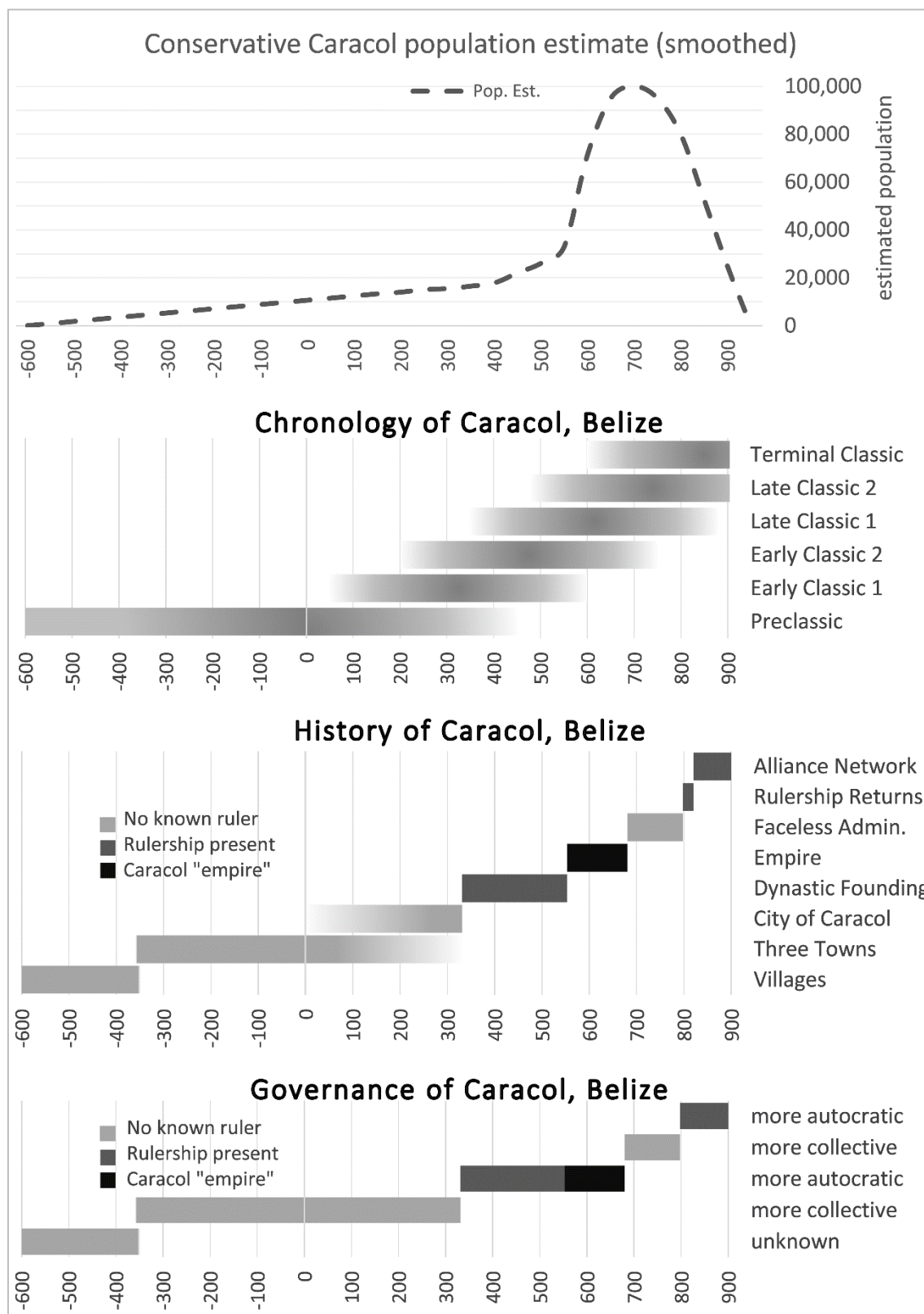
Figure 3. Composite temporal information for Caracol, Belize.

Table 4. Shifts in governance over time between more collective and more autocratic regimes.

Governance Type	Start	End	Primary Feature
more autocratic	798	900	Return of rulership with short reigns
more collective	680	798	Faceless administration & Widespread Prosperity
more autocratic	331	680	Ruling dynasty founded, expanded, and defeated
more collective	-360	331	Monumental architecture constructed
Unknown	-600	-360	Initial settlement on the landscape

polities. Chronologically this period covers the very end of Early Classic 1, all of Early Classic 2, and ends with Late Classic 1, condensing the historical periods of "Dynastic Founding" and "Empire" (from Table 4) together with the same ruling lineage for over 349 years.

While the polity of Caracol shrinks in the period that follows (with the loss of control of Tikal and Naranjo), the local administrative apparatus continues to function and this leads to the most collective form of governance present at Caracol the city with a thriving bureaucratic system. This period has a faceless administration that oversees taxation and the provisioning of urban services; its policies lead to widespread prosperity and low inequality for over 100 years. The symbolic egalitarian practices of shared elite and non-elite practices that emerged before this period provide for Caracol's population apogee and widespread wealth.

The resurgence of rulership may not have caused the decline of Caracol the city, but it co-occurs with more autocratic social practices. The widespread wealth sharing of the earlier period breaks down. The new rulers exhibit new iconography and likely become part of a broader alliance. While Caracol saw out-migration throughout this period, the city center sees traumatic damage and abandonment at the end of the Terminal Classic period as well as massive depopulation by 900 CE.

Conclusion

While Caracol had a population of over 100,000 people and a more collective governance system during its apogee, it did not begin that way. Initial settlement on the landscape that would become the city eventually changed via collective action and the construction of E groups. Three once independent centers joined together, built a long east-west causeway, and created the foundation for *Ux Witz Ha'* (the three

stone place). Early governance through more community level aspects was fostered for almost 700 years until the founding of a dynastic lineage in 331 CE. This event roughly co-occurs with the interment of a Teotihuacan individual in the city's downtown, suggesting a potential linkage. Three dynastic rulers in place from 553 until 680 CE expanded the Caracol polity through the subjugation of Tikal and Naranjo. The successful warfare led to population growth, planned urban expansion, and greater wealth sharing within the city of Caracol. Following the breakup of this larger empire, the city exhibited a more collective form of governance until dynastic rule was re-established. This event is followed by increasing inequality and then by depopulation during the city's last hundred years. This outline of Caracol's history demonstrates that its apogee alone does not cover the great transformations and changes the city experienced as it grew. Rather, the city shifted between more collective and more autocratic systems of governance over its 1500-year lifespan, and the three different ways of breaking up time presented here provide unique perspectives on those transformations and changes.

References Cited

Blanton, Richard E., and Lane F. Fargher
    2016   *How Humans Cooperate: Confronting the Challenges of Collective Action*. University Press of Colorado, Boulder.

Boix, Carles
    2015   *Political order and inequality : their foundations and their consequences for human welfare*. Cambridge studies in comparative politics. Cambridge University Press, New York, NY.

Brown, Shayna L.
    1998   An Analysis of a Protoclassic Female Costume from the site of Caracol, Belize. M.A.,

Department of Liberal Studies, University of Centrla Flordia, Orlando, FL.

Chase, Adrian S.Z.

2016   Districting and Urban Services at Caracol, Belize: Intrasite Boundaries in an Evolving Maya Cityscape. *Research Reports in Belizean Archaeology* 13:15-28.

2017   Residential Inequality Among the Ancient Maya: Operationalizing Household Architectural Volume at Caracol, Belize. *Research Reports in Belizean Archaeology* 14:31-39.

2019   Water Management Among the Ancient Maya: Degrees of Latitude. *Research Reports in Belizean Archaeology* 16:101-109.

2022   Urban Life at Caracol, Belize: Neighborhoods, Inequality, Infrastructure, and Governance. PhD, School of Human Evolution and Social Change, Arizona State University, Tempe.

Chase, Adrian S.Z., Elyse D.Z. Chase, Diane Z. Chase, and Arlen F. Chase

2024   Population History for Caracol, Belize: Numbers, Complexity, and Urbanism. In *Ancient Mesoamerican Population History: Demography, Social Complexity, and Change*, edited by Adrian S.Z. Chase, Arlen F. Chase, and Diane Z. Chase. Amerind Studies in Anthropology. University of Arizona Press, Tucson.

Chase, Adrian S.Z., and John F. Weishampel

2016   Using LiDAR and GIS to Investigate Water and Soil Management in the Agricultural Terracing at Caracol, Belize. *Advances in Archaeological Practice* 4(3):357-370.

Chase, Arlen F., and Diane Z. Chase

1989   The Investigation of Classic Period Maya Warfare at Caracol, Belize. *Mayab* 5:5-18.

1995   External Impetus, Internal Synthesis, and Standardization: E Group Assemblages and the Crystalization of Classic Maya Society in the Southern Lowlands. In *The Emergence of Lowland Maya Civilization: The Transition from the Preclassic to Early Classic*, edited by N. Grube, pp. 87-101. Acta Mesoamericana No. 8, Berlin.

1998a   Late Classic Maya Political Structure, Polity Size, and Warfare Arenas. In *Anatomía de Una Civilización Aproximaciones Interdisciplinarias a la Cultura Maya*, edited by Andrés Ciudad Ruíz, and y otros, pp. 11-29. Sociedad Española de Estudios Mayas, Madrid.

1998b   Scale and Intensity in Classic Period Maya Agriculture: Terracing and Settlement at the "Garden City" of Caracol, Belize. *Culture & Agriculture* 20(2-3):60-77.

2004   Terminal Classic Status-Linked Ceramics and the Maya "Collapse": De Facto Refuse at Caracol, Belize. In *The Terminal Classic in the Maya Lowlands: Collapse, Transition, and Transformation*, edited by Arthur Demarest, Prudence M. Rice, and Don S. Rice, pp. 342-366. University of Colorado Press, Boulder, CO.

2009   Symbolic Egalitarianism and Homogenized Distributions in the Archaeological Record at Caracol, Belize: Method, Theory, and Complexity. *Research Reports in Belizean Archaeology* 6(1):15-24.

2011   Status and Power: Caracol, Teotihuacan, and the Early Classic Maya World. *Research Reports in Belizean Archaeology* 8:3-18.

2012   elize Red Ceramics and their Implications for Trade and Exchange in the Eastern Maya Lowlands. *Research Reports in Belizean Archaeology* 9:3-14.

2017   E Groups and the Rise of Complexity in the Southeastern Maya Lowlands. In *Maya E Groups: Calendars, Astronomy, and Urbanism in the Early Lowlands*, edited by David A. Freidel, Arlen F. Chase, Anne S. Dowd, and Jerry Murdock, pp. 31-71. Maya Studies, Diane Z. Chase, and Arlen F. Chase, general editor. University of Florida Press, Gainesville.

2018   Sampling and Timeframes: Contextualizing the Protoclassic and Early Classic Periods at Caracol, Belize. *Research Reports in Belizean Archaeology* 15:3-15.

2020a   Final Moments: Contextualizing On-Floor Archaeological Materials from Caracol, Belize. *Ancient Mesoamerica* 31(1):77-87.

2020b   The Materialization of Classic Period Maya Warfare: Caracol Stranger-Kings at Tikal. In *A Forest of History: The Maya after the Emergence of Divine Kingship*, edited by Travis W. Stanton, and M. Kathryn Brown, pp. 20-48. University Press of Colorado, Boulder.

2021   The Transformation of Maya Rulership at Caracol, Belize. In *Maya Kingship: Rupture and Transformation from Classic to Postclassic Times*, edited by Tsubasa Okoshi, Arlen F. Chase, Philippe Nondedeo, and Charlotte M. Arnauld, pp. 224-245. University Press of Florida, Gainesville.

Chase, Arlen F., Diane Z. Chase, and Adrian S.Z. Chase

2022   Caracol, Belize and Tikal, Guatemala: Ancient Human-Nature Relationships in their Socio-Political Context. In *Sustainability and*

Water Management in the Maya World and Beyond, edited by Jean T. Larmon, Lisa J. Lucero, and Fred Valdez, pp. 143-170. University Press of Colorado, Boulder, CO.

Chase, Diane Z., and Arlen F. Chase
2003   Texts and Contexts in Classic Maya Warfare: A Brief Consideration of Epigraphy and Archaeology at Caracol, Belize. In *Ancient Mesoamerican Warfare*, edited by M.K. Brown, and T.W. Stanton, pp. 171-188. Alta Mira Press, Walnut Creek, CA.

2008   ¿Que no nos cuentan los jeroglíficos?: Arqueología e Historia en Caracol, Belice. *Mayab* 20:93-108.

2014   Path Dependency in the Rise and Denouement of a Classic Maya City: The Case of Caracol, Belize. In *The Resilience and Vulnerability of Ancient Landscapes: Transforming Maya Archaeology through IHOPE*, Vol AP3A Paper 24, edited by Arlen F. Chase, and Vernon L. Scarborough, pp. 142-154. Archeological Papers of the American Anthropological Association, Vol. 24. American Anthropological Association, Arlington, VA.

2017   Caracol, Belize, and Changing Perceptions of Ancient Maya Society. journal article. *Journal of Archaeological Research* 25(3):185-249.

2021   The Rupture of Classic Maya Divine Kingship from the Perspective of Postclassic Archaeology, Iconography, and Ethnohistory. In *Maya Kingship: Rupture and Transformation from Classic to Postclassic Times*, edited by Tsubasa Okoshi, Arlen F. Chase, Philippe Nondedeo, and Charlotte M. Arnauld, pp. 224-245. University Press of Florida, Gainesville.

Chase, Diane Z., Arlen F. Chase, and Adrian S.Z. Chase
2023   Economic and Socio-Political Change during the Classic and Terminal Classic Periods at Caracol, Belize. In *Ancient Maya Embedded Economies*, edited by Bernadette Cap, and Rachel A. Horowitz. University Press of Colorado, Boulder.

Feinman, Gary M., and David M. Carballo
2018   Collaborative and competitive strategies in the variability and resiliency of large-scale societies in Mesoamerica. *Economic Anthropology* 5(1):7-19.

Freidel, David A., Arlen F. Chase, Anne S. Dowd, and Jerry Murdock (editors)
2017   *Maya E Groups: Calendars, Astronomy, and Urbanism in the Early Lowlands*. Maya Studies. University Press of Florida, Gainesville.

Grube, Nikolai
2021   Nostalgic Kings: The Rhetoric of Terminal Classic Maya Inscriptions. In *Maya Kingship: Rupture and Transformation from Classic to Postclassic Times*, edited by Tsubasa Okoshi, Arlen F. Chase, Philippe Nondédéo, and Charlotte M. Arnauld, pp. 35-50, Arlen F. Chase, and Diane Z. Chase, general editor. University Press of Florida, Gainesville, FL.

Hassig, Ross
1991   Roads, routes, and ties that bind. In *Ancient road networks and settlement hierarchies in the New World*, edited by Charles D. Trombold, pp. 17-27. Cambridge University Press, New York, NY.

Helmke, Christophe
2020   Under The Lordly Monarchs of the North: The Epigraphy of Northern Belize. *Ancient Mesoamerica* 31(2):261-286.

Helmke, Christophe, Arlen F. Chase, and Diane Z. Chase
2019   Another Look at Stela 2 of Caracol, Belize. *Mexicon* XLI(4):97-104.

Helmke, Christophe, Harri Kettunen, and Stanley Guenter
2006   Comments on the Hieroglyphic Texts of the B-group Ballcourt Markers at Caracol, Belize. *Wayeb* 23:1-27.

Houston, Stephen D.
1991   Appendix: Caracol Altar 21:38-42. Palenque, Mexico.

Houston, Stephen, Edwin Román Ramírez, Thomas G. Garrison, David Stuart, Héctor Escobedo Ayala, and Pamela Rosales
2021   A Teotihuacan complex at the Classic Maya city of Tikal, Guatemala. *Antiquity*:1-9.

LeMoine, Jean-Baptiste, Christina T. Halperin, and Miriam Salas
2022   Maya molded-carved ceramics as boundary objects: Terminal classic ceramic production and the forging of political relations in the mopan valley of Guatemala. *Journal of Anthropological Archaeology* 68:101463.

Martin, Simon
2005   Caracol Altar 21 Revisited: More Data on Double Bird and Tikal's Wars of the Mid-Sixth Century. *The PARI Journal* 6(1):1-9.
2020   *Ancient Maya Politics: A Political Anthropology of the Classic Period 150-900 CE*. Cambridge University Press, Cambridge.

Modelski, George
2003   *World Cities: -3000 to 2000*. Signature Book Printing Inc., Gaithersburg, Maryland.

Ostrom, Elinor
    2007   Collective Action Theory. In *Oxford Handbook of Comparative Politics*, edited by Carles Boix, and Susan C. Stokes, pp. 186-208. Oxford University Press, New York, NY.

Smith, Monica L.
    2016   Urban infrastructure as materialized consensus. *World Archaeology* 48(1):164-178.

Sugiyama, Nawa, William L. Fash, Barbara W. Fash, and Saburo Sugiyama
    2020   The Maya at Teotihuacan? New Insights into Teotihuacan-Maya Interactions from the Plaza of the Columns Complex. In *Teotihuacan: The World Beyond the City*, edited by Kenneth G. Hirth, David M. Carballo, and Bárbara Arroyo, pp. 139-171. Dumbarton Oaks Pre-Columbian Symposia and Colloquia, Colin McEwan, general editor. Dumbarton Oaks Research Library and Collections, Washington, D.C.

Thompson, J. Eric S.
    1931   *Archaeological Investigations in the Southern Cayo District British Honduras*. Anthropological Series. Field Museum of Natural History, Chicago.

Tokovinine, Alexandre
    2013   Place and Identity in Classic Maya Narratives. *Studies in Pre-Columbian Art and Archaeology* (37):i-168.